Traffic Impact Assessment

Prepared for Progress Road Holdings Pty Ltd

Proposed Commercial Offices

1 Progress Rd, Mt Hutton

Prepared by

Northern Transport Planning and Engineering Pty Ltd

A.B.N. 79 056 088 629

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233708

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QUALITY ASSURANCE

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This document has been authorised by Ron Brown BE, EngSc  7th August, 2023

1. Introduction

Northern Transport Planning and Engineering Pty Ltd have been engaged by Progress Road Holdings Pty Ltd to provide a Traffic Impact Assessment Report in support of proposed commercial office buildings at 1 Progress Rd, Mt Hutton in the Lake Macquarie Region.

2. Existing Site Layout

The existing site location is currently a residential building lot adjacent to an ALDI retail zone, the layout of which is shown in Figure 2-1 below:

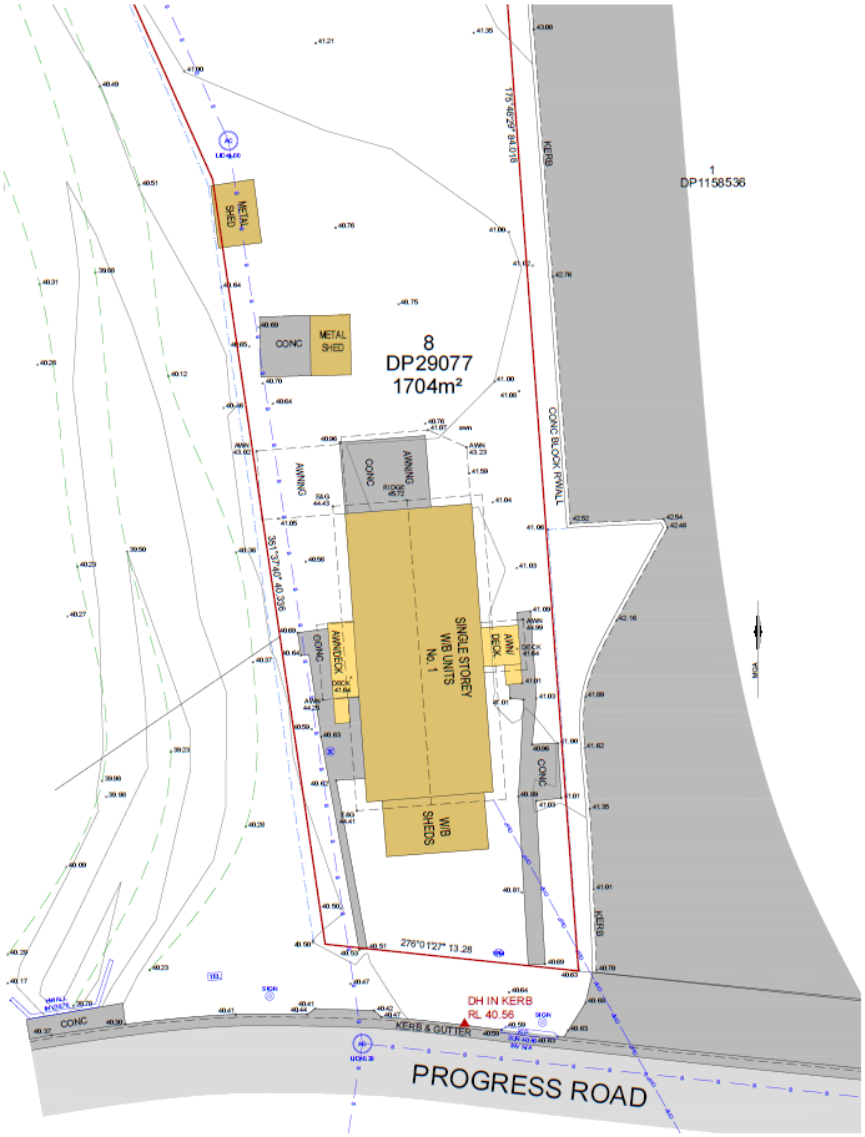


Figure 2-1: Existing Site Layout and Access, 1 Progress Rd, Mt Hutton

A street view of the existing residential area is shown in Figure 2-2 below:

Figure 2-2: Street view of residential area (the proposed site location) next to retail zone

3. Proposed Site Layout

It is proposed that the site be converted to a commercial zone with offices and a showroom as shown in Figure 3-1 below:

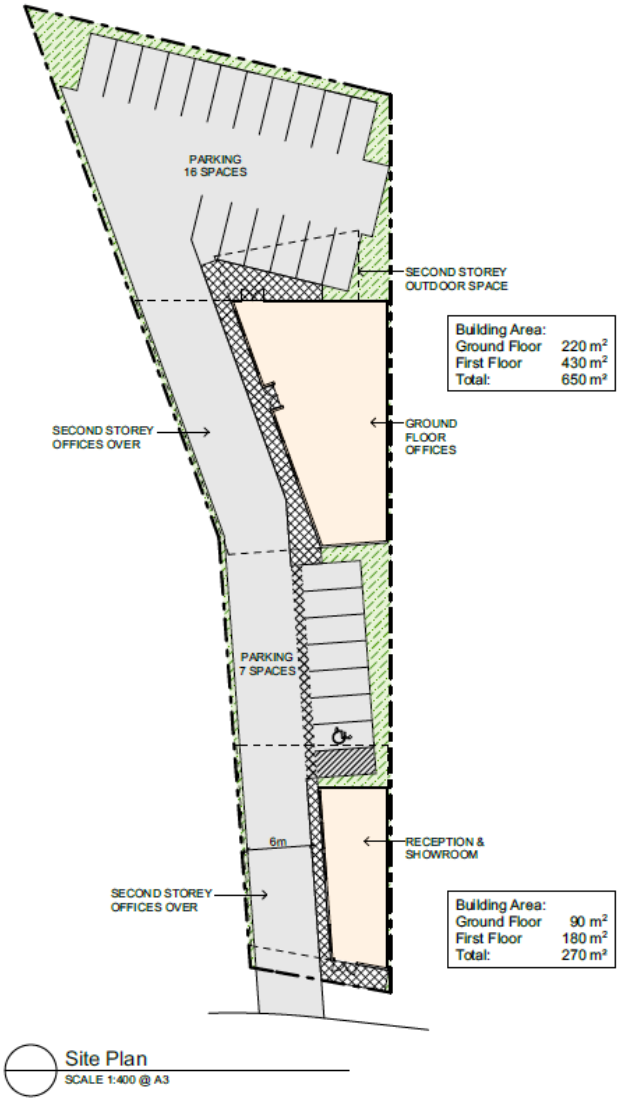


Figure 3-1: Site plan of the proposed commercial offices

Discussion

The site covers an area of 1704 m^2 and will contain two proposed commercial buildings each with a ground floor and first floor. The reception and showroom building will have a Gross Floor Area of 270 m^2 and the Office Building with 650 m^2, bringing the Total Floor Area to 920 m^2.

There are 23 parking spaces proposed including 1 disability parking space.

4. Existing Traffic

Surveys of existing traffic were undertaken with a camera at the intersection of Progress Rd & Dunkley Rd and with automatic counters on Progress Road, West of Dunkley Pde, as shown below in Figure 4-1:

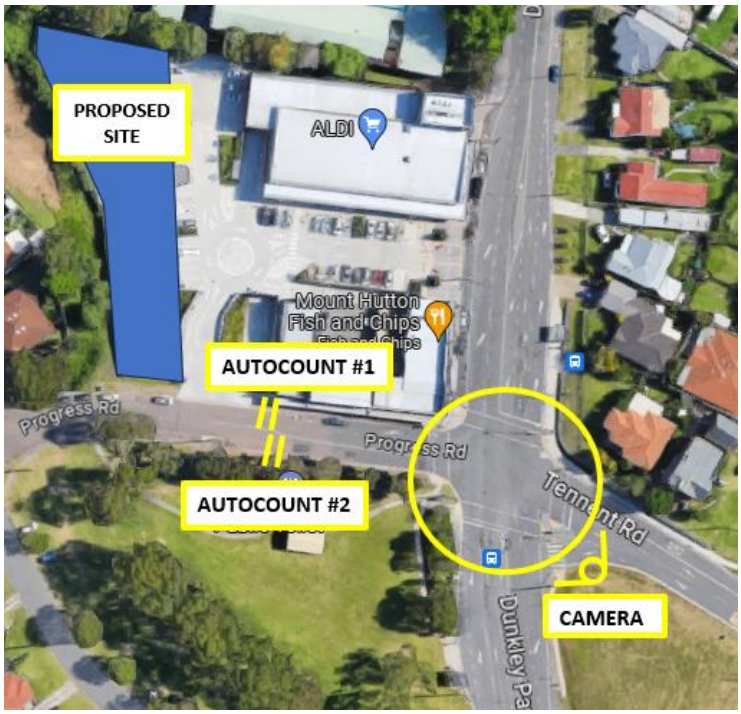


Figure 4-1: Location of camera and automatic counters near proposed site on Progress Rd.

Intersection Counts

A survey of existing traffic flows was carried out at the intersection of Progress Drive and Dunkley Parade for the PM period on Thursday, 15th June and the AM period on Friday, 16th June 2023. A still from the intersection count footage is shown in Figure 4-2 below:

Figure 4-2: Still from Intersection Count Footage of Progress Rd / Dunkley Pde (looking West)

The results of these peak hour counts are summarized in Figure 4-3 and Figure 4-4 below.

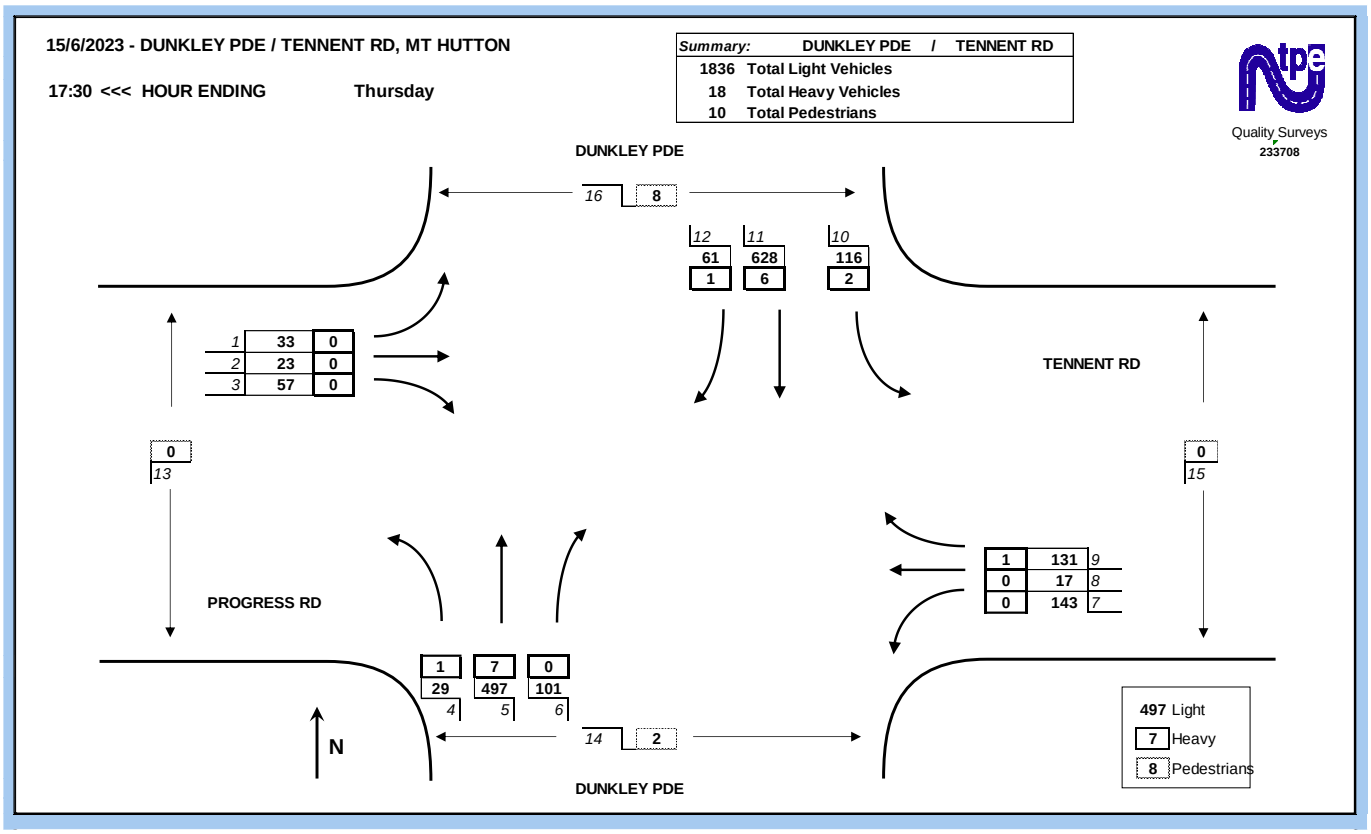


Figure 4-3: Peak Hour Count at Progress Rd / Dunkley Pde (PM Period)

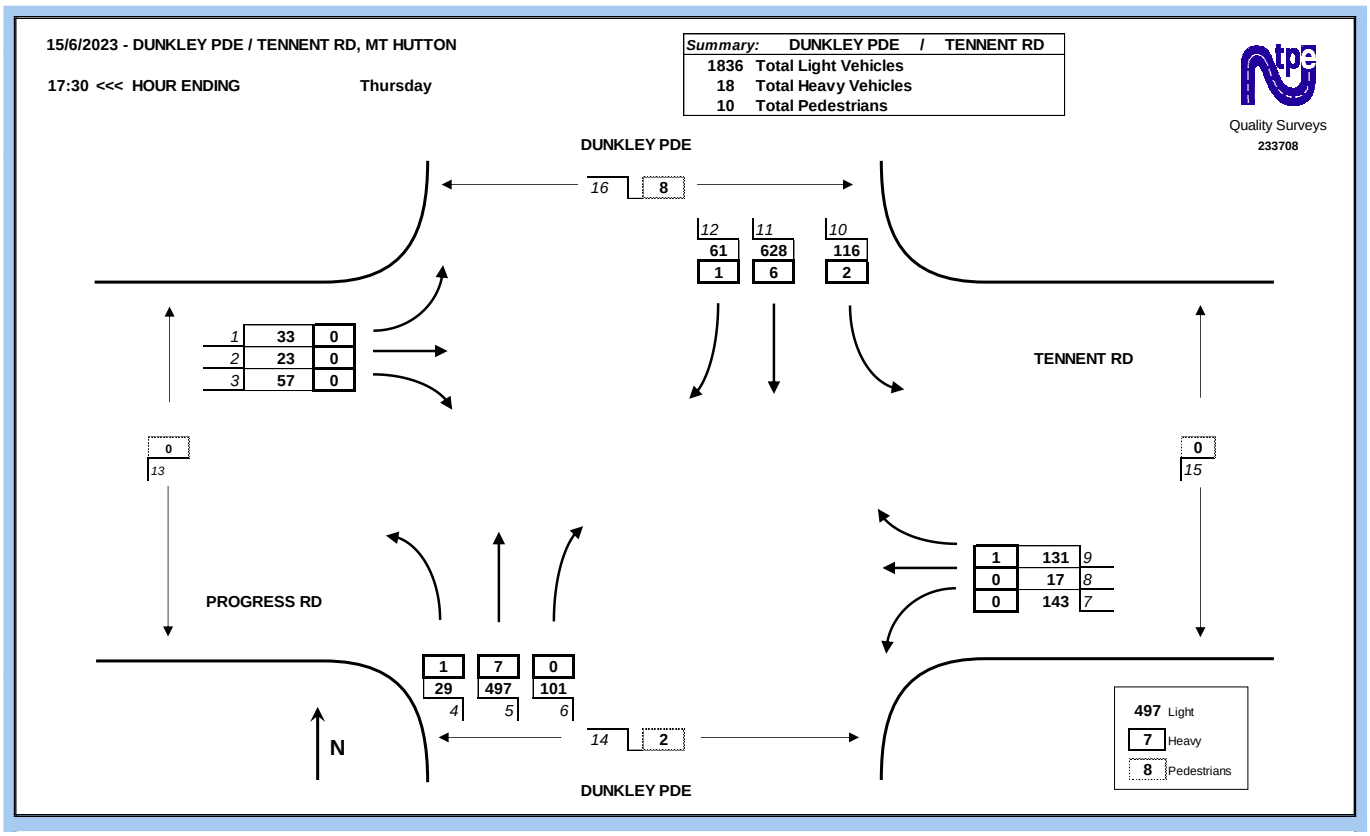


Figure 4-4: Peak Hour Count at Progress Rd / Dunkley Pde (AM Period)

A full report of the intersection counts is attached in Appendix A at the end of this report.

There was also a survey undertaken of the ALDI access to show traffic utilising the existing commercial area. The Peak Hour hourly counts are presented in Figure 4-5 below:

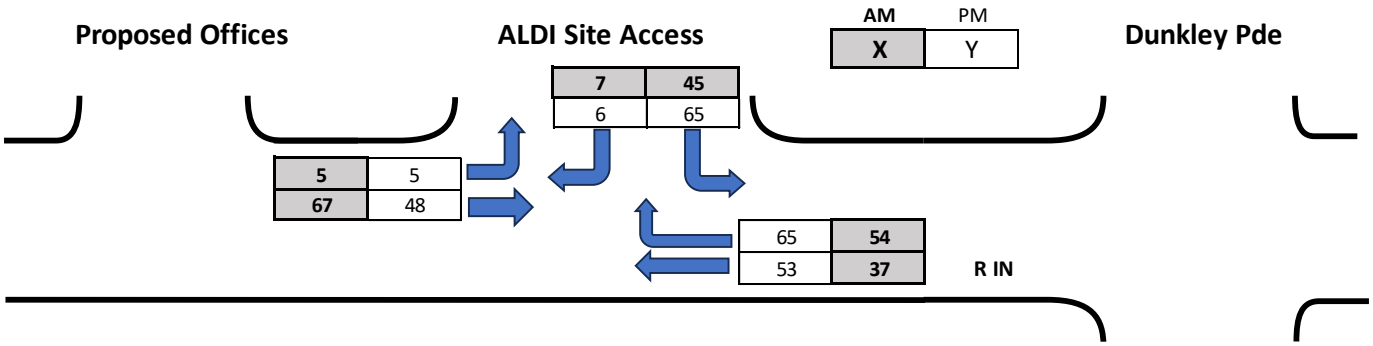


Figure 4-5: Traffic utilising existing ALDI Site Access

Discussion
The maximum peak hour of traffic for the intersection of Progress Rd & Dunkley Pde was observed on the hour ending 5:30 PM with 1836 total vehicle movements. The AM peak hour period ending 9:15 AM saw 1612 total vehicle movements.

Automatic Counts

An automatic count was carried out for a week on Progress Rd, 30m West of Dunkley Pde, from Sunday 18th June to Saturday 24th June. The location of the count is shown below in Figure 4-6 & Figure 4-7 below:

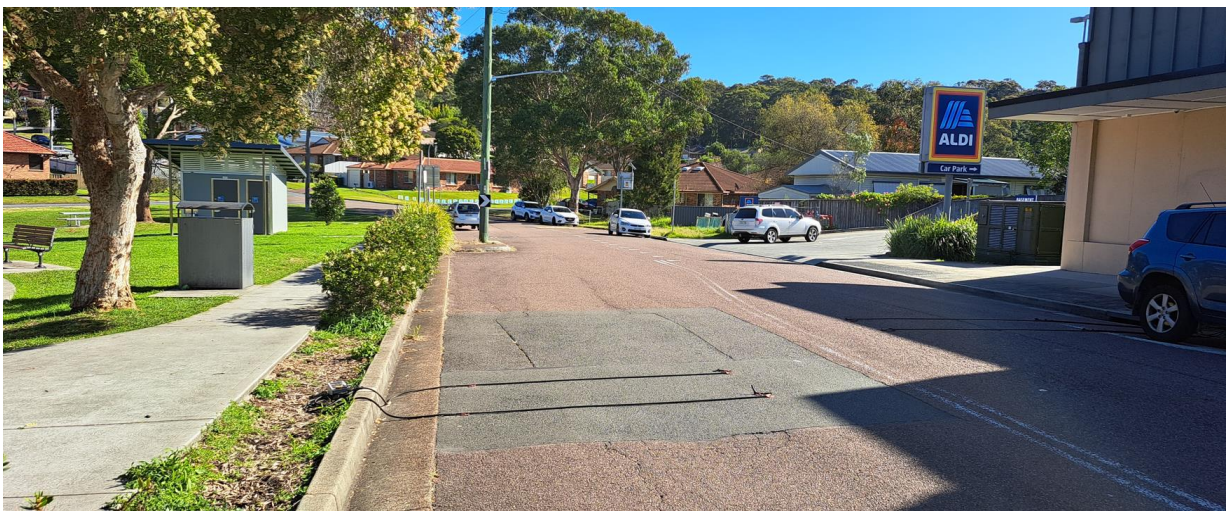


Figure 4-6: Autocount location on Progress Rd, West of Dunkley Pde (looking West)

Figure 4-7: Autocount location on Progress Rd, just West of Dunkley Pde (looking East)

The summarized results averaging Monday to Friday are presented in Table 4-1 below:

Table 4-1: Automatic Count Results, Progress Rd 30m West of Dunkley Pde (Average of Mon-Fri)

Direction:	***AM Peak***		***PM Peak***		***Daily Veh:***
	Time:	***Veh:***	***Time:***	***Veh:***	
Eastbound	8:00 – 9:00	115	14:00 – 15:00	160	1419
Westbound	10:00 – 11:00	102	15:00 – 16:00	137	1098
Bidirectional	10:00 – 11:00	191	14:00 – 15:00	258	2517

The full results are shown in Appendix B at the end of this report.

Discussion:
On an average weekday, the PM peak between 2:00 PM & 3:00 PM has 258 Vehicles (Veh) and the AM Peak between 10:00 AM & 11:00 AM has 191 Veh. The daily traffic amounted to 2517 Veh.

Most of the traffic using the existing ALDI access on Progress Rd came from the intersection with Dunkley Pde. To the west of the proposed site is only a residential area with no connecting roads to other suburbs.

5. Trip Generation

Transport for NSW's Guide to Traffic Generating Developments via TDT 2013/04a provides the following Trip Generation Rates in Table 5-1 below:

Table 5-1: TforNSW Trip Generation Rates for Office / Commercial Areas TDT 2013/04a

Daily vehicle trips = 11 per 100 m^2 gross floor area Morning peak hour vehicle trips = 1.6 per 100 m^2 gross floor area. Evening peak hour vehicle trips = 1.2 per 100 m^2 gross floor area.

This was used to derive the total trip generations for the proposed development detailed in Table 5-2 below:

Table 5-2: Predicted Trip Generation for Office/Commercial

Component	Time	Active Area m^2	Trip Rate per 100m^2	Trips
Office / Commercial Area	AM Peak Hour	920	1.6	**15**
	PM Peak Hour	920	1.2	**12**
	DAILY	920	11	102

Discussion
The predicted trip generation from the proposed development is 15 trips in the AM Peak and 12 trips in PM Peak.

6. Predicted Trip Distribution

The following assumptions have been used to derive the trip distribution for the proposed development:

AM Peak 70% inward / 30% outward **PM Peak** 30% in / 70% outward

Using the Trips totals for the AM and PM Peaks above, the predicted trip distribution is shown in Table 6-1 below:

Table 6-1: Trip Distribution Table

	AM		PM	
	%	No.	%	No.
Exit	0.3	4	0.7	9
Entry	0.7	11	0.3	3
Total	1	15	1	12

This is visually represented with the existing road network in Figure 6-1 below:

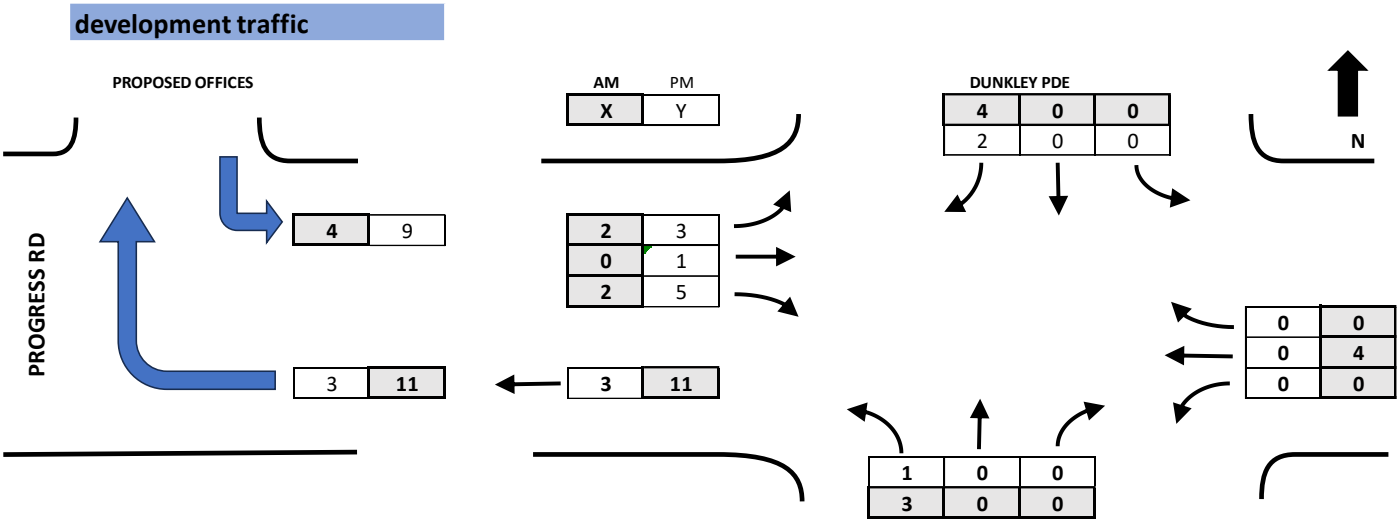


Figure 6-1: Traffic flows generated by proposed offices and intersecting with Dunkley Pde Intersection (AM & PM)

Discussion

As shown in Figure 6-1, it is assumed that all vehicles generated by the development will come from or go to the East via the intersection with Dunkley Pde. This is because the area to the west is a residential area with no connecting roads to other suburbs.

7. Existing Plus Development Traffic 2022

The trips predicted to be generated by the proposed development have been added to the movements already reported for the peak hours in Section 3: Existing Traffic. This presented below in Figure 7-1:

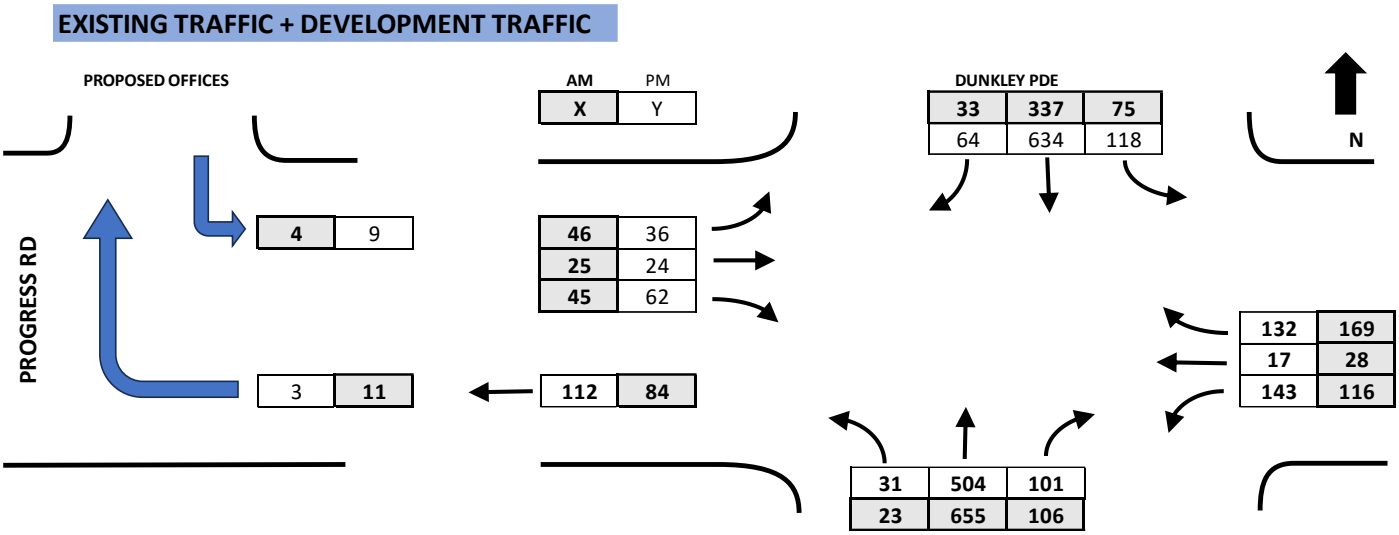


Figure 7-1: Existing Plus Development Traffic Flows

8. SIDRA Analysis

In order to assess the impact of the proposed facility on the surrounding road network the Intersection Analysis Tool, SIDRA, has been used to analyse the performance of the intersection of Progress Rd / Dunkley Pde.

SIDRA derives the Level of Service at an intersection based on the average delay per vehicle, which can be applied to both an individual movement and the entire intersection. The concept is the same for both signalised and un-signalised intersections. Levels of service are ranked for A to F as summarised below in Table 8-1.

Table 8-1: Intersection Level of Service Performance Categories

	Control Delay per Vehicle	
Level of Service	**All Intersection Types**	**Description**
A	d <= 14.5	Excellent
B	14.5 < d <= 28.5	Very Good
C	28.5 < d <= 42.5	Good
D	42.5 < d <= 56.5	Acceptable
E	56.5 < d <= 70.5	Poor
F	70.5 < d	Very Poor

The layout of the site for Progress Rd / Dunkley Pde used for the SIDRA analysis is shown in Figure 8-1 below:

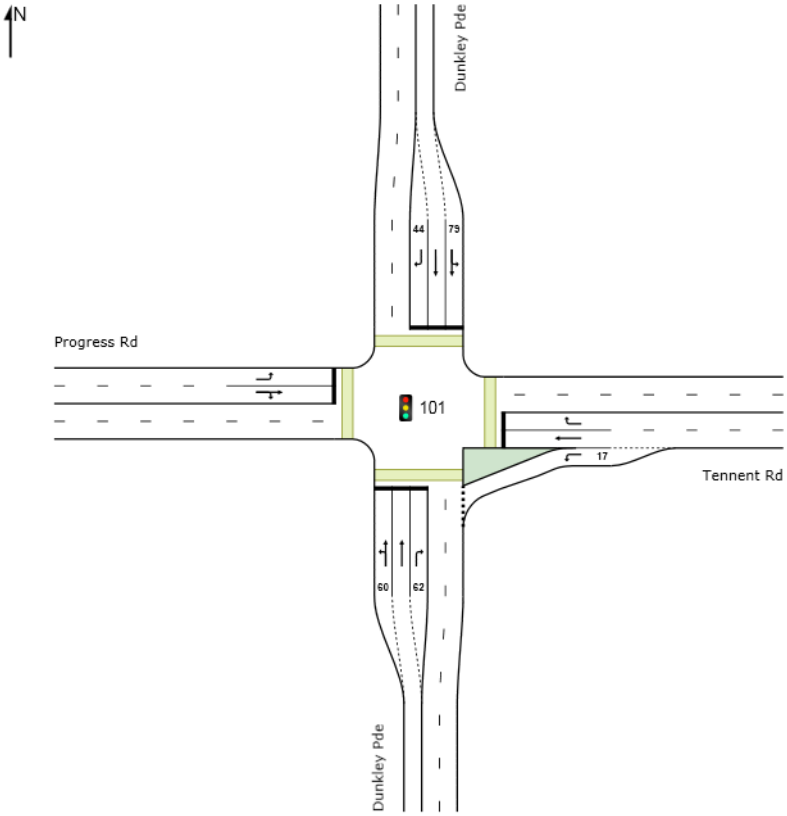


Figure 8-1: SIDRA layout for Progress Rd & Dunkley Pde Intersection

9. SIDRA Results

The SIDRA results for the intersection of Progress Rd & Dunkley Pde are shown below from Table 9-1 to Table 9-6 for the following respective scenarios:

1. Existing 2023 Traffic (AM Peak Hour)
2. Existing 2023 Traffic (PM Peak Hour)
3. Existing 2023 Traffic with Development Traffic (AM Peak Hour)
4. Existing 2023 Traffic with Development Traffic (PM Peak Hour)
5. Estimated 2033 Traffic with Development Traffic (AM Peak Hour)
6. Estimated 2033 Traffic with Development Traffic (PM Peak Hour)

Estimated 2033 Traffic was derived by applying a yearly growth factor of 2% to all movements excluding those associated with the western leg of the intersection. This is based on the following assumptions:

- The Mt Hutton neighbourhood to the west of the intersection with Dunkley Pde continues without any roads connecting it to other suburbs.
- Both the Mt Hutton neighbourhood to the west of the intersection with Dunkley Pde and the existing ALDI commercial area experience no significant development.
- Traffic accessing the ALDI retail area and the proposed commercial offices remain constant.

Table 9-1: Existing 2023 Traffic (AM Peak Hour)

MOVEMENT SUMMARY

Site: 101 [Site1 Progress Rd / Dunkley Pde (AM)

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunkley Pde															
1	L2	20	0	20	0.0		0.657	27.8	**LOS B**	9.2	65.4	0.94	0.82	0.98	22.0
2	T1	655	11	655	1.7	*	0.657	22.2	**LOS B**	9.2	65.6	0.94	0.82	0.98	34.2
3	R2	106	2	106	1.9	*	0.578	36.1	**LOS C**	3.3	23.2	1.00	0.80	1.07	13.3
Approach		781	13	781	1.7		0.657	24.2	**LOS B**	9.2	65.6	0.95	0.82	0.99	31.2
East: Tennent Rd															
4	L2	116	0	116	0.0		0.099	6.2	**LOS A**	0.7	5.1	0.34	0.63	0.34	34.3
5	T1	24	0	24	0.0		0.092	25.6	**LOS B**	0.6	4.5	0.91	0.65	0.91	18.5
6	R2	169	1	169	0.6	*	0.685	34.1	**LOS C**	5.2	36.6	1.00	0.86	1.15	25.9
Approach		309	1	309	0.3		0.685	22.9	**LOS B**	5.2	36.6	0.74	0.76	0.83	26.8
North: Dunkley Pde															
7	L2	75	1	75	1.3		0.396	24.0	**LOS B**	5.1	36.4	0.84	0.73	0.84	28.7
8	T1	337	14	337	4.2		0.396	19.4	**LOS B**	5.1	36.4	0.85	0.72	0.85	35.7
9	R2	29	1	29	3.4		0.160	34.0	**LOS C**	0.8	6.0	0.95	0.71	0.95	27.2
Approach		441	16	441	3.6		0.396	21.2	**LOS B**	5.1	36.4	0.86	0.72	0.86	33.7
West: Progress Rd															
10	L2	44	1	44	2.3		0.241	34.4	**LOS C**	1.3	9.1	0.96	0.73	0.96	27.1
11	T1	25	0	25	0.0	*	0.360	29.3	**LOS C**	2.0	14.0	0.97	0.74	0.97	15.4
12	R2	43	0	43	0.0		0.360	34.9	**LOS C**	2.0	14.0	0.97	0.74	0.97	17.1
Approach		112	1	112	0.9		0.360	33.4	**LOS C**	2.0	14.0	0.97	0.74	0.97	21.5
All Vehicles		1643	31	1643	1.9		0.685	23.8	**LOS B**	9.2	65.6	0.89	0.77	0.92	30.5

* Critical Movement (Signal Timing)

Table 9-2: Existing 2023 Traffic (PM Peak Hour)

MOVEMENT SUMMARY

Site: 101 [Site1 Progress Rd / Dunkley Pde (PM)

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunkley Pde															
1	L2	30	1	30	3.3		0.489	25.4	**LOS B**	6.7	47.4	0.88	0.74	0.88	23.2
2	T1	504	7	504	1.4		0.489	19.8	**LOS B**	6.7	47.6	0.88	0.74	0.88	35.8
3	R2	101	0	101	0.0	*	0.544	35.8	**LOS C**	3.1	21.5	0.99	0.79	1.03	13.4
Approach		635	8	635	1.3		0.544	22.6	**LOS B**	6.7	47.6	0.90	0.75	0.90	31.8
East: Tennent Rd															
4	L2	143	0	143	0.0		0.141	7.7	**LOS A**	1.3	9.2	0.44	0.66	0.44	31.9
5	T1	17	0	17	0.0		0.075	26.6	**LOS B**	0.5	3.3	0.92	0.64	0.92	18.0
6	R2	132	1	132	0.8	*	0.613	34.1	**LOS C**	4.0	28.3	1.00	0.82	1.08	25.9
Approach		292	1	292	0.3		0.613	20.7	**LOS B**	4.0	28.3	0.72	0.73	0.76	27.0

North: Dunkley Pde														
7	L2	118	2	118	1.7	0.674	26.6	**LOS B**	10.3	73.0	0.93	0.83	0.97	27.6
8	T1	634	6	634	0.9	* 0.674	21.4	**LOS B**	10.3	73.0	0.94	0.83	0.98	34.3
9	R2	62	1	62	1.6	0.338	34.8	**LOS C**	1.8	13.0	0.97	0.75	0.97	26.9
Approach		814	9	814	1.1	0.674	23.2	**LOS B**	10.3	73.0	0.94	0.82	0.98	32.6
West: Progress Rd														
10	L2	33	0	33	0.0	0.178	34.0	**LOS C**	0.9	6.6	0.95	0.72	0.95	27.3
11	T1	23	0	23	0.0	* 0.425	29.6	**LOS C**	2.4	16.7	0.98	0.75	0.98	15.2
12	R2	57	0	57	0.0	0.425	35.1	**LOS C**	2.4	16.7	0.98	0.75	0.98	16.8
Approach		113	0	113	0.0	0.425	33.7	**LOS C**	2.4	16.7	0.97	0.74	0.97	20.3
All Vehicles		1854	18	1854	1.0	0.674	23.3	**LOS B**	10.3	73.0	0.89	0.78	0.92	30.8

* Critical Movement (Signal Timing)

Table 9-3: Existing 2023 Traffic with Development Traffic (AM Peak Hour)

MOVEMENT SUMMARY

Site: 101 [Site1 Progress Rd / Dunkley Pde (AM) + Development Traffic

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Avg. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunkley Pde														
1	L2	23	0	23	0.0	0.660	27.8	**LOS B**	9.3	65.9	0.94	0.82	0.98	22.0
2	T1	655	11	655	1.7	* 0.660	22.3	**LOS B**	9.3	66.1	0.94	0.82	0.98	34.2
3	R2	106	2	106	1.9	* 0.578	36.1	**LOS C**	3.3	23.2	1.00	0.80	1.07	13.3
Approach		784	13	784	1.7	0.660	24.3	**LOS B**	9.3	66.1	0.95	0.82	0.99	31.2
East: Tennent Rd														
4	L2	116	0	116	0.0	0.099	6.2	**LOS A**	0.7	5.1	0.34	0.63	0.34	34.3
5	T1	28	0	28	0.0	0.108	25.7	**LOS B**	0.8	5.3	0.91	0.65	0.91	18.4
6	R2	169	1	169	0.6	* 0.685	34.1	**LOS C**	5.2	36.6	1.00	0.86	1.15	25.9
Approach		313	1	313	0.3	0.685	23.0	**LOS B**	5.2	36.6	0.75	0.76	0.83	26.7
North: Dunkley Pde														
7	L2	75	1	75	1.3	0.396	24.0	**LOS B**	5.1	36.4	0.84	0.73	0.84	28.7
8	T1	337	14	337	4.2	0.396	19.4	**LOS B**	5.1	36.4	0.85	0.72	0.85	35.7
9	R2	33	1	33	3.0	0.182	34.1	**LOS C**	0.9	6.8	0.95	0.72	0.95	27.2
Approach		445	16	445	3.6	0.396	21.3	**LOS B**	5.1	36.4	0.86	0.72	0.86	33.6
West: Progress Rd														
10	L2	46	1	46	2.2	0.252	34.4	**LOS C**	1.3	9.5	0.96	0.73	0.96	27.0
11	T1	25	0	25	0.0	* 0.371	29.3	**LOS C**	2.1	14.5	0.97	0.75	0.97	15.4
12	R2	45	0	45	0.0	0.371	34.9	**LOS C**	2.1	14.5	0.97	0.75	0.97	17.0
Approach		116	1	116	0.9	0.371	33.5	**LOS C**	2.1	14.5	0.97	0.74	0.97	21.5
All Vehicles		1658	31	1658	1.9	0.685	23.9	**LOS B**	9.3	66.1	0.89	0.77	0.92	30.4

* Critical Movement (Signal Timing)

Table 9-4: Existing 2023 Traffic with Development Traffic (PM Peak Hour)

MOVEMENT SUMMARY

Site: 101 [Site1 Progress Rd / Dunkley Pde (PM) + Development Traffic (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunkley Pde															
1	L2	31	1	31	3.2		0.490	25.4	**LOS B**	6.7	47.5	0.88	0.74	0.88	23.2
2	T1	504	7	504	1.4		0.490	19.8	**LOS B**	6.7	47.7	0.88	0.74	0.88	35.7
3	R2	101	0	101	0.0	*	0.544	35.8	**LOS C**	3.1	21.5	0.99	0.79	1.03	13.4
Approach		636	8	636	1.3		0.544	22.6	**LOS B**	6.7	47.7	0.90	0.75	0.90	31.7
East: Tennent Rd															
4	L2	143	0	143	0.0		0.141	8.0	**LOS A**	1.4	9.7	0.46	0.66	0.46	31.4
5	T1	17	0	17	0.0		0.075	26.6	**LOS B**	0.5	3.3	0.92	0.64	0.92	18.0
6	R2	132	1	132	0.8	*	0.613	34.1	**LOS C**	4.0	28.3	1.00	0.82	1.08	25.9
Approach		292	1	292	0.3		0.613	20.9	**LOS B**	4.0	28.3	0.73	0.73	0.77	26.9
North: Dunkley Pde															
7	L2	118	2	118	1.7		0.674	26.6	**LOS B**	10.3	73.0	0.93	0.83	0.97	27.6
8	T1	634	6	634	0.9	*	0.674	21.4	**LOS B**	10.3	73.0	0.94	0.83	0.98	34.3
9	R2	64	1	64	1.6		0.348	34.9	**LOS C**	1.9	13.4	0.97	0.75	0.97	26.9
Approach		816	9	816	1.1		0.674	23.2	**LOS B**	10.3	73.0	0.94	0.82	0.98	32.6
West: Progress Rd															
10	L2	36	0	36	0.0		0.194	34.1	**LOS C**	1.0	7.3	0.95	0.72	0.95	27.2
11	T1	24	0	24	0.0	*	0.457	29.7	**LOS C**	2.6	18.0	0.98	0.76	0.98	15.1
12	R2	62	0	62	0.0		0.457	35.3	**LOS C**	2.6	18.0	0.98	0.76	0.98	16.8
Approach		122	0	122	0.0		0.457	33.8	**LOS C**	2.6	18.0	0.97	0.75	0.97	20.3
All Vehicles		1866	18	1866	1.0		0.674	23.4	**LOS B**	10.3	73.0	0.90	0.78	0.92	30.7

* Critical Movement (Signal Timing)

Table 9-5: Estimated 2033 Traffic with Development Traffic (AM Peak Hour)

MOVEMENT SUMMARY

Site: 101 [Site1 Progress Rd / Dunkley Pde (AM) + Development Traffic 2033 (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)
Design Life Analysis (Final Year): Results for 10 years

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunkley Pde														
1	L2	23	0	23	0.0	0.787	31.6	**LOS C**	12.4	88.2	0.99	0.95	1.17	20.0

2	T1	655	11	786	1.7	* 0.787	26.0	LOS B	12.5	88.4	0.99	0.95	1.17	31.9
3	R2	106	2	127	1.9	* 0.694	37.4	LOS C	4.0	28.7	1.00	0.86	1.20	13.0
Approach		784	13	936	1.7	0.787	27.7	LOS B	12.5	88.4	0.99	0.94	1.17	29.3
East: Tennent Rd														
4	L2	116	0	139	0.0	0.122	6.5	LOS A	1.0	6.8	0.36	0.64	0.36	33.9
5	T1	28	0	28	0.0	0.108	25.7	LOS B	0.8	5.3	0.91	0.65	0.91	18.4
6	R2	169	1	203	0.6	* 0.822	37.8	LOS C	6.8	47.7	1.00	0.97	1.39	24.4
Approach		313	1	370	0.3	0.822	25.1	LOS B	6.8	47.7	0.75	0.82	0.97	25.6
North: Dunkley Pde														
7	L2	75	1	90	1.3	0.475	24.6	LOS B	6.3	45.0	0.86	0.75	0.86	28.4
8	T1	337	14	404	4.2	0.475	19.9	LOS B	6.3	45.0	0.88	0.74	0.88	35.3
9	R2	33	1	33	3.0	0.182	34.1	LOS C	0.9	6.8	0.95	0.72	0.95	27.2
Approach		445	16	527	3.6	0.475	21.6	LOS B	6.3	45.0	0.88	0.74	0.88	33.4
West: Progress Rd														
10	L2	46	1	46	2.2	0.252	34.4	LOS C	1.3	9.5	0.96	0.73	0.96	27.0
11	T1	25	0	25	0.0	* 0.371	29.3	LOS C	2.1	14.5	0.97	0.75	0.97	15.4
12	R2	45	0	45	0.0	0.371	34.9	LOS C	2.1	14.5	0.97	0.75	0.97	17.0
Approach		116	1	116	0.9	0.371	33.5	LOS C	2.1	14.5	0.97	0.74	0.97	21.5
All Vehicles		1658	31	1950	1.9	0.822	25.9	LOS B	12.5	88.4	0.91	0.85	1.04	29.3

* Critical Movement (Signal Timing)

Table 9-6: Estimated 2033 Traffic with Development Traffic (PM Peak Hour)

MOVEMENT SUMMARY

Site: 101 [Site1 Progress Rd / Dunkley Pde (PM) + Development Traffic 2033 (Site Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)
Design Life Analysis (Final Year): Results for 10 years

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Dunkley Pde														
1	L2	31	1	31	3.2	0.550	25.1	LOS B	8.0	56.8	0.89	0.76	0.89	23.5
2	T1	504	7	605	1.4	0.550	19.5	LOS B	8.1	57.0	0.89	0.76	0.89	36.0
3	R2	101	0	121	0.0	* 0.653	36.8	LOS C	3.8	26.6	1.00	0.84	1.14	13.2
Approach		636	8	757	1.2	0.653	22.5	LOS B	8.1	57.0	0.91	0.77	0.93	31.9
East: Tennent Rd														
4	L2	143	0	172	0.0	0.180	8.9	LOS A	1.9	13.2	0.51	0.68	0.51	30.2
5	T1	17	0	17	0.0	0.087	27.9	LOS B	0.5	3.3	0.94	0.65	0.94	17.4
6	R2	132	1	158	0.8	* 0.858	40.8	LOS C	5.5	38.8	1.00	1.00	1.56	23.3
Approach		292	1	347	0.3	0.858	24.4	LOS B	5.5	38.8	0.75	0.83	1.01	24.8

North: Dunkley Pde													
7	L2	118	2	142	1.7	0.781	29.3 **LOS C**	13.9	98.6	0.97	0.94	1.12	26.4
8	T1	634	6	761	0.9	* 0.781	24.0 **LOS B**	13.9	98.6	0.96	0.93	1.12	32.7
9	R2	64	1	64	1.6	0.348	34.9 **LOS C**	1.9	13.4	0.97	0.75	0.97	26.9
Approach		816	9	966	1.1	0.781	25.5 **LOS B**	13.9	98.6	0.97	0.92	1.11	31.3
West: Progress Rd													
10	L2	36	0	36	0.0	0.194	34.1 **LOS C**	1.0	7.3	0.95	0.72	0.95	27.2
11	T1	24	0	24	0.0	* 0.457	29.7 **LOS C**	2.6	18.0	0.98	0.76	0.98	15.1
12	R2	62	0	62	0.0	0.457	35.3 **LOS C**	2.6	18.0	0.98	0.76	0.98	16.8
Approach		122	0	122	0.0	0.457	33.8 **LOS C**	2.6	18.0	0.97	0.75	0.97	20.3
All Vehicles		1866	18	2192	1.0	0.858	24.7 **LOS B**	13.9	98.6	0.91	0.84	1.02	30.0

* Critical Movement (Signal Timing)

Discussion

The existing traffic analysis shows that the overall intersection performs at a Level of Service (LoS) of B. All approaches perform with a LoS of B except for the Western Approach on Progress Rd, which has a LoS of C.

When adding traffic generated by the proposed development there was virtually no change in the performance of the intersection with overall performance remaining at Level of Service B.

The SIDRA assessment also shows that the intersection of Progress Rd/ Dudley Rd performs well in 2033 with overall performance retaining a LoS of B.

10. Parking Assessment

The parking layout for the commercial offices is shown below in Figure 10-1:

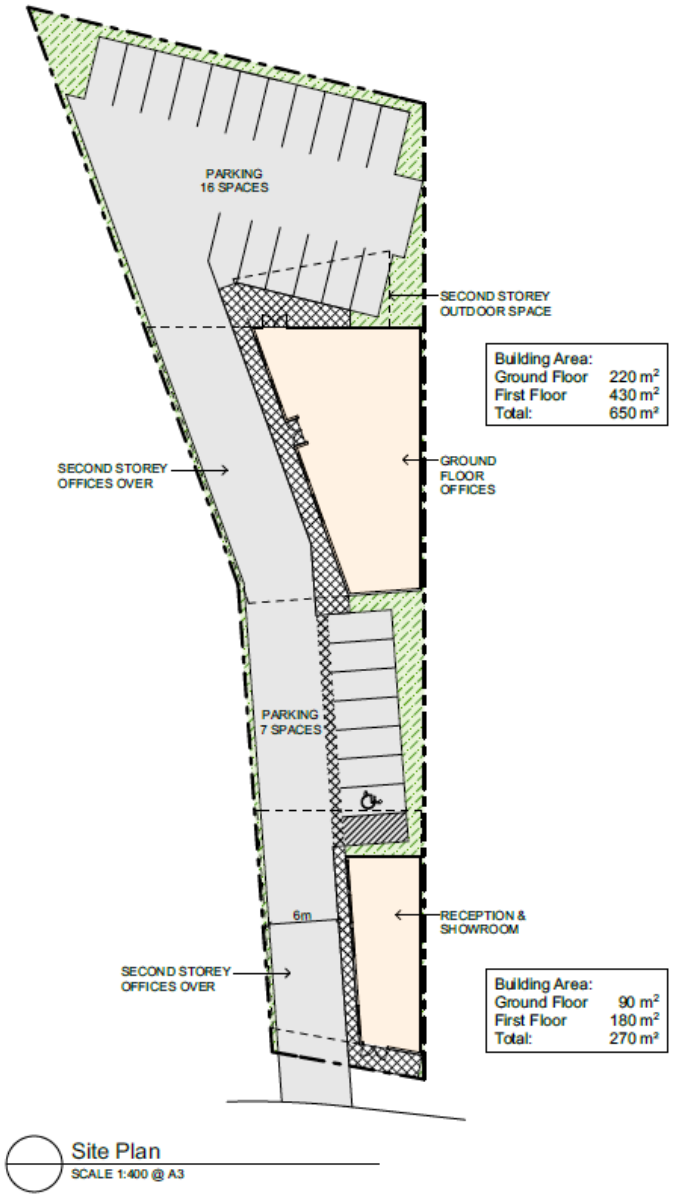


Figure 10-1: Parking layout for commercial offices

A more detailed floor plan for the proposed site is shown below in Figure 10-2:

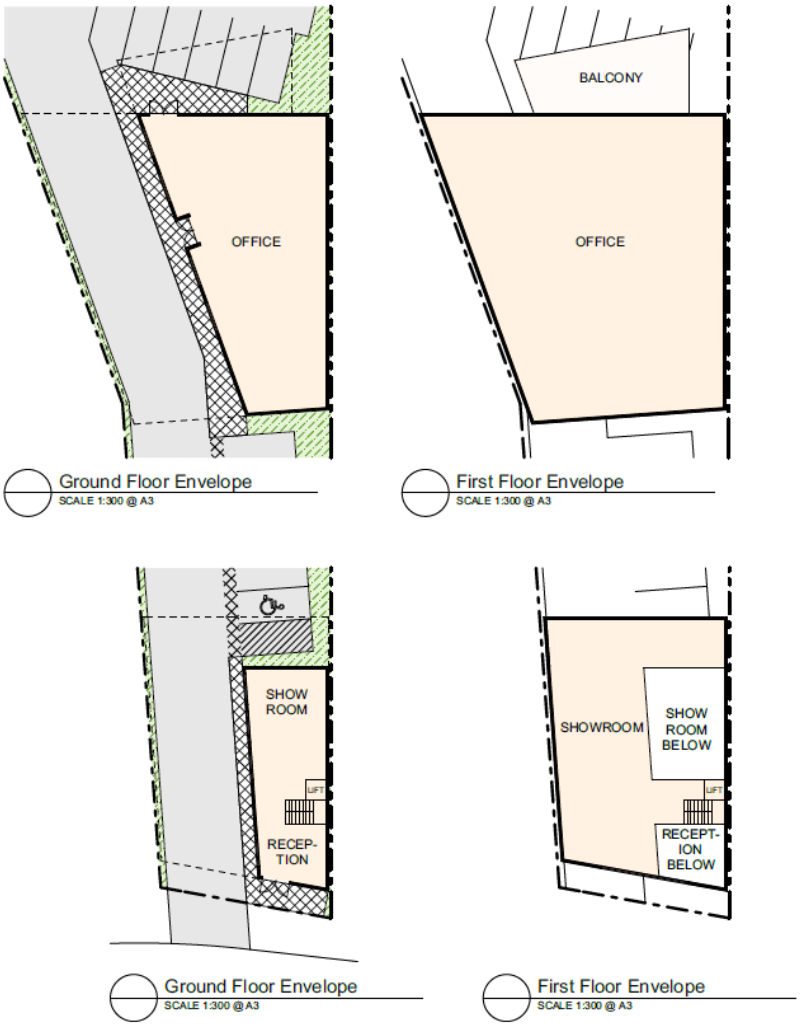


Figure 10-2: Detailed Floor Plan of commercial offices

Discussion

The parking requirements for industrial or commercial offices, according to Lake Macquarie City Council Development Control Plan 2014 (LMCC DCP 2014), are as follows:

1 parking space per 100 m² Gross Floor Area (GFA)
1 parking space per 50 m² of office space GFA
1 disability parking space if total parking spaces is greater than 5 and less than 50 spaces

The calculations for the required parking spaces, are shown below in Table 10-1:

Table 10-1: Calculation for Required Parking Spaces (as per LMCC DCP 2014)

Category	Sub-category	Required Spaces / GFA (m²)	GFA (m²)	Spaces Req.
Industry	Non-Office Space	1 Space per 100m²	270	3
	Office Space	2 Space per 100m²	650	13
			Total:	**16**

There are 16 total parking spaces including 1 disability parking space required according to council standards and there are 23 parking spaces provided by the proposed development. Therefore, the parking requirements are met.

11. CONCLUSIONS & RECOMMENDATIONS

The following conclusions have been made after the assessment of the site:

- Trips generated by the proposed commercial offices will have an insignificant impact on the intersection of Progress Rd & Dunkley Pde, which currently runs at a Level of Service of B. It will continue to run at a Level of Service of B in 2033, assuming a growth rate of 2% per year from 2023.

- The number of proposed parking spaces meets the requirements for industrial / office developments as per Lake Macquarie's Development Control Plan 2014.

Based on these conclusions it is recommended that the proposed commercial offices for 1 Progress Rd, Mt Hutton be approved.

Appendix A

INTERSECTION COUNT

Progress Rd / Dunkley Pde

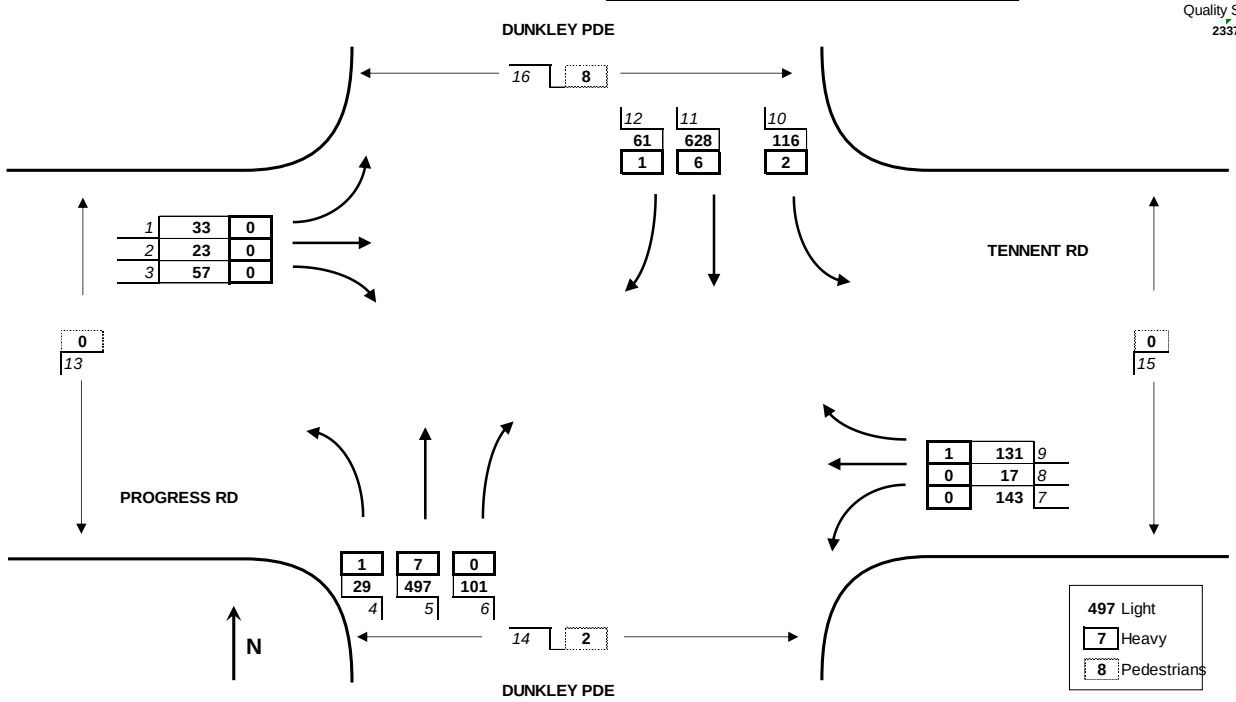
Thursday, 15th June 2023 (PM Period)
Friday, 16th June 2023 (AM Period)

15/6/2023 - DUNKLEY PDE / TENNENT RD, MT HUTTON

17:30 <<< HOUR ENDING **Thursday**

Summary:	DUNKLEY PDE / TENNENT RD
1836	Total Light Vehicles
18	Total Heavy Vehicles
10	Total Pedestrians

Quality Surveys
233708



15/6/2023 - DUNKLEY PDE / TENNENT RD, MT HUTTON

Light Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR		Pedestrians 13	14	15	16
15:15	14	15	18	6	114	27	19	4	28	26	126	16	413		10	2	3	17
15:30	12	6	22	10	92	24	63	8	34	20	127	16	434		5	2	0	3
15:45	6	11	16	6	108	23	39	4	27	29	158	20	447		1	2	0	2
16:00	9 <	9 <	16 <	5	104	31	23	7	26	31	143	10	414	1708	2 <	2 <	1	7 <
16:15	10	3	18 <	4	111	27	30 <	8	24	29	162	12	438	1733	0	0	3	2
16:30	6	7	12	9	99	19	26	10	22	35	160	14	419	1718	1	3	3 <	1
16:45	10	6	21	5	113	19	38	5 <	42	27	171	11	468	1739	0	0	0 <	1
17:00	7	5	13	6	117	29	38	3	34	37 <	148 <	12	449	1774	0	0	0	3
17:15	8	8	9	7	144	22	35	6	27	22	158	18	464	1800	0	2	0	2
17:30	8	4	14	11 <	123	31	32	3	28 <	30	151	20	455	1836 <	0	0	0	2
17:45	11	6	16	4	125 <	22	15	3	19	34	167	18	440	1808	0	0	0	3
18:00	8	3	19	5	84	32 <	22	4	18	30	150	18 <	393	1752	0	0	0	6

Heavy Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR	
15:15	0	0	1	0	3	1	1	0	0	2	3	1	12	
15:30	0	0	1	0	7	0	2	0	1	0	0	0	11	
15:45	0	0	0	0	1	1	2	0	0	0	1	0	5	
16:00	0	0	0 <	0	1 <	0 <	1 <	0	0	2 <	6	0 <	10	38 <
16:15	0	0	0	0	1	0	1 <	0	1 <	0	5	0	8	34
16:30	0	0	0	0	1	0	0	1 <	0	0	4	0	6	29
16:45	0	0	0	0	3	0	0	0 <	0	1	4 <	0	8	32
17:00	0	0	0	0	1	0	0	0 <	0	1	0	0	2	24
17:15	0	0	0	1 <	2	0	0	0 <	0	0	1	0	4	20
17:30	0	0	0	0 <	1	0	0	0	1	0	1	1 <	4	18
17:45	0	0	0	0 <	0	0	0	0	0	0	1	0 <	1	11
18:00	1 <	0	0	0 <	0	0	0	0	0	0	1	0 <	2	11

All Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR	
15:15	14	15	19	6	117	28	20	4	28	28	129	17	425	
15:30	12	6	23	10	99	24	65	8	35	20	127	16	445	
15:45	6	11	16	6	109	24	41	4	27	29	159	20	452	
16:00	9 <	9 <	16 <	5	105	31 <	24	7	26	33	149	10	424	1746
16:15	10	3	18	4	112	27	31 <	8	25	29	167	12	446	1767
16:30	6	7	12	9	100	19	26	11	22	35	164	14	425	1747
16:45	10	6	21	5	116	19	38	5 <	42	28	175 <	11	476	1771
17:00	7	5	13	6	118	29	38	3	34	38 <	148	12	451	1798
17:15	8	8	9	8	146	22	35	6	27	22	159	18	468	1820
17:30	8	4	14	11 <	124	31	32	3	29 <	30	152	21	459	1854 <
17:45	11	6	16	4	125 <	22	15	3	19	34	168	18	441	1819
18:00	9	3	19	5	84	32 <	22	4	18	30	151	18 <	395	1763

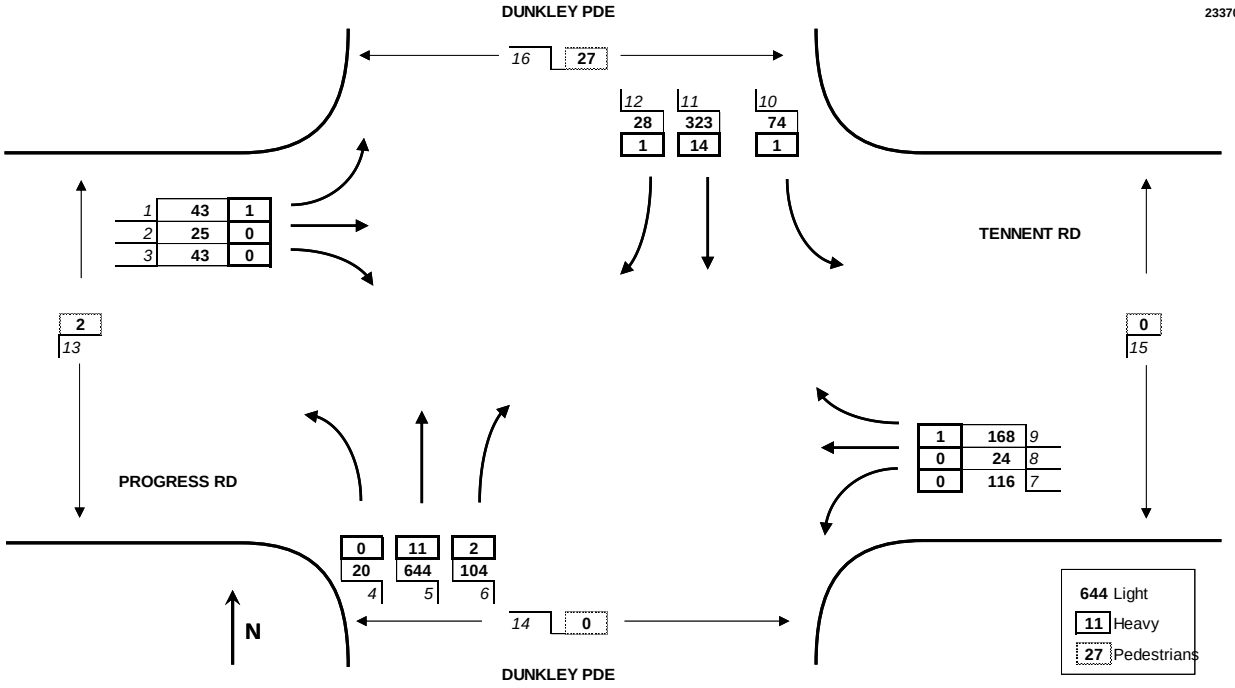
Note Arrows "<" indicate the end time for the peak hour for each turning movement.

16/6/2023 - DUNKLEY PDE / TENNENT RD, MT HUTTON

9:15 <<< HOUR ENDING **Friday**

Summary:	DUNKLEY PDE / TENNENT RD
1612	Total Light Vehicles
31	Total Heavy Vehicles
29	Total Pedestrians

Quality Surveys
233708



16/6/2023 - DUNKLEY PDE / TENNENT RD, MT HUTTON

Light Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR		Pedestrians 13	14	15	16
07:15	6	0	5	3	113	6	8	1	31	7	33	1	214		0	0	0	0
07:30	6	0	1	0	125	19	8	2	28	10	43	3	245		0	0	0	0
07:45	8	2	4	2	144	22	16	1	45	15	40	2	301		3	0	0	0
08:00	5	3	4	4	161	18	13	0	29	19	56	5	317	1077	1 <	0	0	4
08:15	13	0	8	5	167	15	19	0	37	11	46	5	326	1189	0 <	0	0	0
08:30	10	4	9	3	165	28	24	3	44	24	63	5	382	1326	0 <	0	0	7
08:45	10	6	14	3	175	31	29	10	55	17	91	9	450	1475	2	0	0	18 <
09:00	12 <	8	11	10	162 <	20	38	10	43 <	17	81	6	418	1576	0	0	0	2
09:15	11	7 <	9	4	142	25 <	25 <	1 <	26	16 <	88	8	362	1612 <	0	0	0	0
09:30	12 <	3	16 <	6	140	13	19	2	23	13	76 <	8	331	1561	0	0	0	0
09:45	7	4	10	8	119	22	15	2	26	14	72	10	309	1420	0	0	0	0
10:00	11	3	6	12 <	134	13	21	2	27	17	84	12 <	342	1344	0	0	1 <	2

Heavy Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR	
07:15	0	1	1	0	3	1	0	0	1	0	6	1	14	
07:30	1	0	0	0	7	1	0	0	0	3	2	1	15	
07:45	0	0	1	0	4	1	0	0	0	0	2	0	8	
08:00	0 <	0 <	0 <	0	4	0	0	0	0	0	4	0 <	8	45 <
08:15	0 <	0	0	0	4 <	1	0	1 <	2	1	3	0	12	43
08:30	1 <	0	0	0	4	2 <	0	0 <	0	0	2	1	10	38
08:45	0 <	0	0	0	3	0	0	0 <	1 <	1	4	0	9	39
09:00	0 <	0	0	0	1	0	0	0 <	0 <	0	6 <	0	7	38
09:15	0 <	0	0	0	3	0	0	0	0	0	2	0	5	31
09:30	0	0	0	0	6	1	1	0	0	2	3 <	0	13	34
09:45	0	0	0	1 <	2	0	0	0	0	1	1	0	5	30
10:00	1 <	0	0	0 <	4	0	1 <	0	0	2 <	1	0	9	32

All Vehicles

	1	2	3	4	5	6	7	8	9	10	11	12	Total Vehicles 15 MIN HOUR	
07:15	6	1	6	3	116	7	8	1	32	7	39	2	228	
07:30	7	0	1	0	132	20	8	2	28	13	45	4	260	
07:45	8	2	5	2	148	23	16	1	45	15	42	2	309	
08:00	5	3	4	4	165	18	13	0	29	19	60	5	325	1122
08:15	13	0	8	5	171	16	19	1	39	12	49	5	338	1232
08:30	11	4	9	3	169	30	24	3	44	24	65	6	392	1364
08:45	10	6	14	3	178 <	31	29	10	56	18	95	9	459	1514
09:00	12 <	8	11	10	163	20	38	10 <	43 <	17	87	6	425	1614
09:15	11	7 <	9	4	145	25 <	25 <	1 <	26	16 <	90	8	367	1643 <
09:30	12	3	16 <	6	146	14	20	2	23	15	79 <	8	344	1595
09:45	7	4	10	9	121	22	15	2	26	15	73	10	314	1450
10:00	12	3	6	12 <	138	13	22	2	27	19	85	12 <	351	1376

Note Arrows "<" indicate the end time for the peak hour for each turning movement.

Appendix B

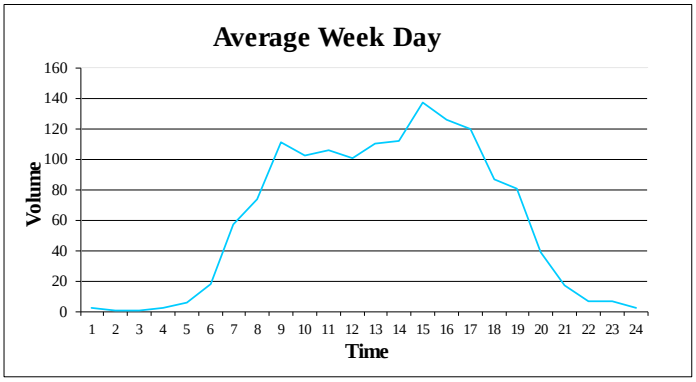
AUTOMATIC COUNT

Progress Rd 20m W of Dunkley Pde

Sunday 18th June – Saturday 24th June, 2023

Site 1 PROGRESS RD BTN ALDI ACCESS & DUNKLEY PDE [50] Eastbound

Day	Sun	Mon	Tue	Wed	Thu	Fri	Sat	W/Day	W/End	7 Day
Time	18/06/23	19/06/2023	20/06/2023	21/06/2023	22/06/2023	23/06/2023	24/06/2023	Ave.	Ave.	Ave
0:00	1	5	1	0	2	4	6	2	4	3
1:00	5	2	1	0	0	0	3	1	4	2
2:00	3	1	1	0	0	2	1	1	2	1
3:00	2	4	2	0	2	2	2	2	2	2
4:00	0	9	2	7	2	8	1	6	1	4
5:00	3	12	22	17	22	15	7	18	5	14
6:00	11	51	62	57	53	63	19	57	15	45
7:00	14	73	74	80	72	67	30	73	22	59
8:00	31	107	114	114	115	105	66	111	49	93
9:00	91	108	96	111	106	89	120	102	106	103
10:00	130	112	108	107	96	106	144	106	137	115
11:00	151	110	84	91	104	112	131	100	141	112
12:00	133	118	94	106	120	111	131	110	132	116
13:00	116	116	103	105	122	113	126	112	121	114
14:00	117	129	133	160	125	139	129	137	123	133
15:00	111	132	110	117	128	141	106	126	109	121
16:00	120	115	108	125	123	125	99	119	110	116
17:00	100	98	89	4	132	108	89	86	95	89
18:00	48	64	69	84	125	61	78	81	63	76
19:00	19	28	40	28	61	35	8	38	14	31
20:00	7	17	17	13	17	21	31	17	19	18
21:00	8	3	12	3	9	7	11	7	10	8
22:00	3	3	5	12	1	10	7	6	5	6
23:00	3	2	3	2	1	3	10	2	7	3
Total	**1227**	**1419**	**1350**	**1343**	**1538**	**1447**	**1355**	**1419**	**1291**	**1383**

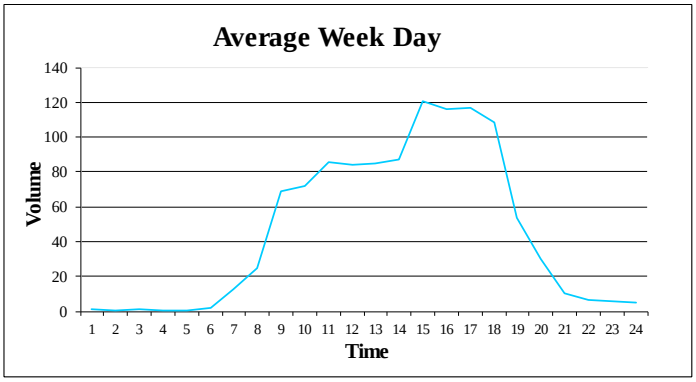


Summary

	from	to	
AM Peak	8:00 AM	9:00 AM	**115**
PM Peak	2:00 PM	3:00 PM	**160**
		Week Day Average	**1419**
		Weekend Day Average	**1291**
		7 Day Average	**1383**

Site 1 PROGRESS RD BTN ALDI ACCESS & DUNKLEY PDE [50] Westbound

Day	Sun	Mon	Tue	Wed	Thu	Fri	Sat	W/Day	W/End	7 Day
Time	18/06/23	19/06/2023	20/06/2023	21/06/2023	22/06/2023	23/06/2023	24/06/2023	Ave.	Ave.	Ave
0:00	1	2	2	1	1	0	1	1	1	1
1:00	3	0	0	0	0	1	0	0	2	1
2:00	1	2	1	0	0	1	1	1	1	1
3:00	0	1	0	0	0	0	1	0	1	0
4:00	0	0	1	0	0	0	0	0	0	0
5:00	1	3	2	2	1	2	1	2	1	2
6:00	3	13	13	12	13	13	6	13	5	10
7:00	3	28	23	31	23	20	6	25	5	19
8:00	21	74	56	68	80	66	49	69	35	59
9:00	54	73	53	73	77	84	93	72	74	72
10:00	80	88	57	96	84	102	122	85	101	90
11:00	114	78	81	97	81	85	107	84	111	92
12:00	105	107	77	72	89	81	90	85	98	89
13:00	90	77	98	79	88	94	92	87	91	88
14:00	103	135	108	136	107	116	88	120	96	113
15:00	94	116	98	137	109	121	88	116	91	109
16:00	89	106	101	129	128	119	73	117	81	106
17:00	66	99	117	120	116	90	68	108	67	97
18:00	37	45	44	53	93	35	51	54	44	51
19:00	18	27	27	26	35	34	13	30	16	26
20:00	3	9	6	7	15	13	18	10	11	10
21:00	3	4	8	7	10	5	7	7	5	6
22:00	7	5	3	7	2	12	7	6	7	6
23:00	3	4	6	4	2	9	8	5	6	5
Total	**899**	**1096**	**982**	**1157**	**1154**	**1103**	**990**	**1098**	**945**	**1054**



Summary

	from	to	
AM Peak	10:00 AM	11:00 AM	**102**
PM Peak	3:00 PM	4:00 PM	**137**
		Week Day Average	**1098**
		Weekend Day Average	**945**
		7 Day Average	**1054**