

TRAFFIC AND PARKING IMPACT ASSESSMENT OF THE PROPOSED RETIREMENT VILLAGE

AT 181 ALLAMBIE ROAD, ALLAMBIE HEIGHTS



Address: Shop 7, 720 Old Princes Highway Sutherland NSW 2232 Postal: P.O Box 66 Sutherland NSW 1499

> Telephone: +61 2 8355 2440 Fax: +61 2 9521 7199 Web: www.mclarentraffic.com.au Email: admin@mclarentraffic.com.au

Division of RAMTRANS Australia ABN: 45067491678 RPEQ: 19457

Transport Planning, Traffic Impact Assessments, Road Safety Audits, Expert Witness



Development Type:	Retirement Village
Site Address:	181 Allambie Road, Allambie Heights
Prepared for:	Allambie Heights Village Ltd
Document reference:	200052.01FA

Status	Issue	Prepared By	Checked By	Date								
Reference Number: 18273												
Draft	Α	DW	LS	22 nd June 2018								
	В	LS		5 th July 2018								
Final	Α	LS	СМ	27 th July 2018								
		Reference Numb	er: 200052									
Draft A		DW		30 th January 2019								
Final	Α	DW		14 th February 2020								

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1 INTRODUCTION

M^cLaren Traffic Engineering (MTE) was commissioned by *Allambie Heights Village Ltd* to provide a Traffic and Parking Impact Assessment of the proposed Retirement Village at 181 Allambie Road, Allambie Heights.

1.1 Description and Scale of Development

The proposed development (as depicted in **Annexure A** for reference), includes the construction of infrastructure and other works required to facilitate the proposed senior living development consisting of 24 dwellings. The proposed development has the following features relevant to this Traffic and Parking Impact Assessment:

- 24 x two-bedroom seniors living units distributed across two apartment buildings;
- Construction of an ancillary Communal building;
- 30 x resident parking spaces located in a basement / lower ground level carpark and one (1) car wash bay on the ground floor;
- 17 x visitor parking spaces with 2 provided within the basement / lower ground level carpark and the remaining 15 provided on ground level;
- Construction of an emergency egress road to the north of the site.

All vehicular access to the site will be from the proposed two-way driveway off Martin Luther Place with the exception of waste collection and loading by vehicles up to a Small Rigid Vehicle (SRV) which will utilise the driveway of the adjacent William Charlton Village site which is located at the intersection of Allambie Road / Mortain Avenue

1.2 State Environmental Planning Policy (Infrastructure) 2007

The proposed development does not qualify as a traffic generating development with relevant size and/or capacity under Clause 104 of the *SEPP (Infrastructure) 2007*. Accordingly, formal referral to the Roads and Maritime Services (RMS) is not necessary and Northern Beaches Council officers can determine accordingly.

1.3 Site Description

Currently, the subject site is predominantly vacant land with William Charlton Retirement Village located on the eastern side of the site. The proposed development has a single frontage to Martin Luther Place to the south. Vehicular access to the site is provided by an internal road from Martin Luther Place. The site is generally surrounded by low density residential dwellings to the east, bushland to the south and west with Fred Hutley Village located directly to the north of the site. The subject site is currently zoned R2 – Low Density Residential under the *Warringah Local Environment Plan 2011*.



1.4 Site Context

The site location is shown in an aerial photo and a map in Figure 1 & Figure 2 below.



Site Location





Site Location

FIGURE 2: SITE CONTEXT – STREET MAP



2 EXISTING TRAFFIC AND PARKING CONDITIONS

2.1 Road Hierarchy

The existing road network within close proximity to the site has the following characteristics:

- 2.1.1 Allambie Road
- RMS classified REGIONAL Road (Road No. 7345);
- Approximately 13m in width facilitating one traffic flow lane and one dedicated bicycle lane in both directions and kerbside parking;
- Signposted 60km/h speed limit;
- Unrestricted kerbside parking permitted on both sides of the road.

2.1.2 Martin Luther Place

- Unclassified LOCAL road;
- Approximately 10m in width facilitating two-way passing and kerbside;
- No speed limit signposted, 50km/h applies;
- Unrestricted kerbside parking permitted on both sides of the road.

2.2 Existing Traffic Management

- Priority controlled intersection of Allambie Road / Martin Luther Place;
- Signalised intersection of Allambie Road / Mortain Avenue.

2.3 Existing Traffic Environment

Traffic counts were completed at the intersections of Allambie Road/ Martin Luther Place and Allambie Road/ Mortain Avenue on 30th and 31st May 2018, representing a typical weekday. Surveys are reproduced in **Annexure B**.

2.3.1 Intersection Performance

Existing intersection performances have been assessed using SIDRA INTERSECTION 8.0. The analysis is summarised in **Table 1**. Detailed SIDRA output summaries are provided in **Annexure C** for reference.



TABLE 1: INTERSECTION PERFORMANCES (SIDRA INTERSECTION 8.0)

Intersection	Peak	Degree of	Average Delay ⁽²⁾	Level of	Control	Worst	
intersection	Hour	Saturation ⁽¹⁾	(sec/veh)	Service ⁽³⁾⁽⁴⁾	Туре	Movement	
		EXIS	TING PERFORMANC	CE			
	A N A	0.00	1.4	NA		RT from	
Allambie Road /	AM	0.66	(Worst: >70)	(Worst: F)		Place	
Martin Luther Place	DM	0.05	0.5	NA	Give way	RT from	
	Pivi	0.85	(Worst: >70)	(Worst: F)		Place	
	0.14	0.00	40.9	С		Through from	
Allambie Road / Mortain Avenue	Alvi	0.99	(Worst: >70)	(Worst: E)	Signalized	South	
	DM	2.01	>70	F	Signalised	Right from	
	PIVI	2.01	(Worst: >70)	(Worst: F)		Allambie Road South	

NOTES:

(1) Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.

(2) Average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.

(3) Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service,

designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.

(4) NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

As shown above the intersection of Allambie Road / Mortain Avenue is currently operating at Level of Service (LoS) C during the AM peak period and LoS F during the PM peak period. LoS F indicates that the intersection is operating at capacity with significant delays and queues. The intersection of Martin Luther Place / Allambie Road indicates existing delays for right turn movements out of the site.

2.4 Future Road and Infrastructure Upgrades

From *Northern Beaches Council's Development Application Tracker* and website, it appears that there are no future planned road changes which will affect existing traffic conditions within the vicinity of the subject site.

2.5 Public Transport

The subject site has access to existing bus route 142, 280 and E66 provided by *State Transit* and *Forest Coach Lines*. The nearest bus stop is located along the sites frontage on Allambie Road (Stop ID 210093). These bus routes provide access to the local suburbs, including Wynyard, Cremorne, Manly Vale, Manly, Chatswood and Frenches Forest. The site has no direct access to the Sydney Trains Network. The subject sites location in relation to the surrounding public transport infrastructure is shown in **Figure 3** below.





★ Site Location





3 PARKING ASSESSMENT

3.1 Council Parking Requirement

Warringah's Development Control Plan 2011 does not provide car parking requirements for seniors housing and as such reference will be made to the *State Environmental Planning Policy (SEPP) (Housing for Seniors or People with a Disability) 2004.*

3.2 State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004

Reference is made to Clause 50 of the SEPP (Housing for Seniors or people with a Disability) 2004 – standards that cannot be used to refuse development consent for self-contained dwellings which states the following in relation to car parking provision:

"(h) parking: if at least the following is provided:

- (i) 0.5 car spaces for each bedroom where the development application is made by a person other than a social housing provider, or"
- (ii) 1 car space for each 5 dwellings where the development application is made by, or is made by a person jointly with, a social housing provider.

Туре	Scale	Rate	Spaces Required	Spaces Provided
Independent Living Unit	24 dwellings with a total of 48 bedrooms	0.5 car spaces per bedroom	24	30
Subtotal	24	-	24	30

TABLE 2: SEPP MINIMUM PARKING REQUIREMENTS

As shown above, the development requires a total of **24** car parking spaces. The site plan indicates a total of **30** car parking spaces for residential dwellings representing a numerical surplus of some six **(6)** parking spaces from the SEPP minimum parking requirements.

The proposed communal building and putting golf course are ancillary to the seniors living dwellings and therefore does not require the provision of visitor parking. Furthermore, the SEPP does not require the provision of visitor parking spaces for seniors living such that the provision of nil (0) parking satisfies the minimum requirements. Nevertheless, the proposed plans indicate a total of **16** visitor parking spaces located on ground level and lower ground level which should be looked upon favourably by Council.



3.3 Bicycle & Motorcycle parking Requirements

Warringah's DCP outlines the following bicycle parking requirement for seniors living developments.

<u>Seniors Housing</u> 1 per 2 Independent living units and for all other types of development 1 per 15 beds. Visitors: 1 per 12 independent living units and for all other types of development 1 per 30 beds.

Applying these rates based upon the 24 independent living units, this would result in twelve (**12**) residential bicycle spaces and two (**2**) visitor bicycle spaces. The plans detail nil (0) residential or visitor bicycle parking however there is sufficient space onsite to provide this provision.

Warringah's DCP does not provide motorcycle parking rates for seniors housing and as such, the DCP does not require the provision of motorcycle parking such that nil (0) provision complies.

3.4 Servicing & Loading

Council's DCP does not specify a specific waste collection provision for seniors living developments. It is proposed that the development will use the historical waste collection area that services William Charlton Village. Currently William Charlton Village's waste is stored and collected twice a week to the north of the site accessed from the driveway located within the intersection of Mortain Avenue / Allambie Road. It is envisaged that this historical waste collection service is sufficient for both the existing William Charlton Village and the proposed development such that the historical operation will satisfy the requirements of the proposed development.

The site provides a loading bay of dimensions 2.8m by 5.4m within the lower ground floor parking area for use by vehicles up to B99 in size. Loading by vehicles larger than a B99 vehicle up to and including a 6.4m Small Rigid Vehicle is proposed to occur via access from the adjacent driveway of the William Charlton Village located within the intersection of Mortain Avenue / Allambie Road.

A bushfire emergency egress lane is provided to the north of the site to provide an alternative exit for firetrucks in an emergency. It should also be noted that the public road within the site is assessed as acceptable for fire brigade access within the *Bush Fire Assessment Report Allambie Heights Village Project 2* completed by *Total Earth Care Pty Ltd* dated January 2020. The subject sites proposed driveway and alternative bushfire exit are assessed below in relation to the guidelines referred to in the following subsections.

3.4.1 <u>NSW Fire Brigades Guidelines for Emergency Vehicle Access</u>

Reference is made to the *NSW Fire Brigades Guidelines for Emergency Vehicle Access Policy No. 4 Version 02* dated 27th October 2010, which provides guidelines regarding the



dimensions of Fire Brigade vehicles and their access requirements. The subject sites driveway and alternate emergency exit provide sufficient dimensions for general appliance egress as well as sufficient grades and transitions, based on the plans in **Annexure A**. However, within the adjacent site of William Charlton Village, the roadway widths near Allambie road are less than the 5.0m specified within the NSW Fire Brigades guidelines document. Despite the variation from the guidelines, swept path analysis has been undertaken for a General Appliance of 10.1m in length with resultant swept paths shown in **Annexure D** for reference. The undertaken swept paths illustrate successful egress of a 10.1m length General Appliance through the adjacent sites driveway. Whether this variation from the guidelines and the swept paths provided in **Annexure D** are acceptable or not is subject to confirmation from a Fire Consultant.

3.4.2 NSW Rural Fire Services Planning for Bush Fire Protection

Reference is made to the *NSW Rural Fire Service Planning for Bush Fire Protection (PBP)* 2006 which provides guidelines regarding the dimensions of Rural Fire Brigade vehicles and their access requirements for bush fires. The subject site driveway and alternate exit provide sufficient dimensions with widths of at least 6m and sufficient grades below 15% on sealed roads or 10% on unsealed roads for fire vehicle access. With respect to the adjacent site of William Charlton Village, the roadway widths near Allambie road are less than the 4.0m specified within the *PBP* but greater than 3.5m. The *PBP* states the following:

Note: Some short constrictions in the access may be accepted where they are not less than the minimum (3.5m), extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.

Despite the variation of 4.0m width from the *PBP* guidelines, swept path analysis has been undertaken for the constricted access with an 8.8m length Medium Rigid Vehicle (MRV) (which the PBP refers to as being equivalent to a Category 1 Tanker), with resultant swept paths shown in **Annexure D** for reference. The undertaken swept paths illustrate successful egress of an MRV through the adjacent sites driveway. Whether this variation from the *PBP* guidelines and the swept paths provided in **Annexure D** are acceptable or not is subject to confirmation from a Fire Consultant.

3.5 Disabled Parking

The Council DCP does not specifically outline any disabled parking with regards to seniors living developments, as such reference is made to the *Building Code of Australia* (BCA) which classifies accommodation for the aged as a Class 3(b) building and stated the following disabled parking requirement.

1 space for every 100 car parking spaces or part thereof

The application of the BCA requirement for the seniors living development requires that there is a minimum of one **(1)** disabled parking space. The lower ground carpark details two (2) adaptable parking spaces of minimum width 3.8m in accordance with AS4299 and four



(4) visitor disabled accessible parking spaces in accordance with AS2890.6 (subject to the required changes in **Section 3.6**) representing compliance with the BCA.

3.6 Car Park Design & Compliance

The car parking layout of both the ground level and lower ground level has been assessed and found to be generally compliant with the relevant clauses of AS2890.1 and AS2890.6 subject to the required changes below. Swept path test results are reproduced in **Annexure D**.

The car parking layout includes the following features:

- A total of **47** car parking spaces including:
 - 30 car parking spaces of minimum 3.2m x 5.4m for residents;
 - 17 car parking spaces of minimum 2.5m x 5.4m for visitors;
- 3.8m width, 5.4m length adaptable spaces for residents of adaptable dwellings;
- 2.4m width by 5.4m length disabled spaces with associated adjacent 2.4m width by 5.4m length shared space for visitors;
- One (1) car wash bay located on ground level.

The following dot points identify required changes to the design which are required to be completed prior to certification at the Construction Certificate Stage. It is recommended that a design certificate be required at the Construction Certificate Stage to confirm the required changes have been implemented, as well as to account for any design changes during the Development Application process.

- The intersection of Martin Luther Lane and Martin Luther Place is required to be signposted and linemarked as a STOP sign controlled intersection with a concept shown in **Annexure E** for reference.
- The proposed disabled accessible spaces and the adjacent shared spaces are to be sufficiently linemarked in accordance with AS2890.6:2009.
- Bollards within the shared spaces located adjacent to disabled accessible spaces are to be set back a complaint distance of 800±50mm from the back of the shared space. Alternatively, the variation in bollard distance from the standards could be approved by an Accessibility Consultant.
- Each disabled accessible parking space and associated shared spaces are required to be changed to have a maximum grade of 1:40 (or 1:33 if the surface is bituminous seal and the space is out of doors), or alternatively be approved for disabled access by an Accessibility Consultant.



- Confirmation from a Fire Consultant is required regarding the emergency egress of fire brigade vehicles outlined in **Section 3.4**.
- Visitor spaces on the ground floor are to be widened to a minimum width of 2.5m.
- Confirmation of a minimum headroom of 2.2m within typical parking spaces and light vehicle circulation areas and 2.5m above disabled accessible spaces and adjacent shared spaces.



4 TRAFFIC ASSESSMENT

The impact of the expected traffic generation levels associated with the subject proposal is discussed in the following sub-sections.

4.1 Traffic Generation

The estimated traffic generation level for the proposed development is based upon the RMS *Guide to Traffic Generating Developments October 2002* and more recent supplements. The RMS publicised updated traffic generation rates for seniors housing within the *Technical Direction TDT 2013/04a*, and will be applied to the seniors living development. The communal building and putting golf course is ancillary to the seniors living development and is not expected to generate additional traffic to or from the site. The expected traffic generation is summarised in **Table 3** below.

Development Type	Scale	Peak Period	Rate	Peak Traffic Generation	Trip Assignment ⁽¹⁾
Independent Living	24	AM ⁽²⁾	0.4 per	9.6 (10)	2 IN; 8 OUT
Unit	24	PM	dwelling	9.6 (10)	8 IN; 2 OUT

TABLE 3: EVENING PEAK HOUR TRAFFIC GENERATION

Note (1): Assumes 20% inbound & 80% outbound during AM peak (shown above). Vice versa for PM. (2) AM morning peak hour does not generally coincide with the network peak hour

As shown above, the traffic generated by the site equates to **10** vehicles trips in both the AM (2 IN; 8 OUT) and PM (8 IN; 2 OUT) peak periods respectively. As stated with the RMS surveys the traffic generation for senior living dwellings does not generally coincide with the peak AM period.

4.2 Traffic Assignment

Given the surrounding road network and limited available routes to / from the site, it is assumed that traffic entering the site will be evenly distributed between the north and the south direction such that 50% of traffic arrives from the north and 50% arrives from the south along Allambie Road. Similarly, traffic exiting the site will be split with 50% travelling north and 50% travelling south along Allambie Road.

4.3 Traffic Impact

The traffic generation outlined in **Section 4.1 & 4.2** above has been added to the existing traffic volumes recorded and SIDRA INTERSECTION 8.0 used to assess the resulting performance of each intersection. The purpose of this assessment is to compare the existing intersection operations to the future scenario under the increased traffic load. The results of this assessment are shown in **Table 4**.



TABLE 4: FUTURE INTERSECTION PERFORMANCES (SIDRA INTERSECTION 8.0)

Intersection	Peak	Degree of	Average Delay ⁽²⁾	Level of	Control	Worst						
intersection	Hour	Saturation ⁽¹⁾	(sec/veh)	Service ⁽³⁾⁽⁴⁾	Туре	Movement						
EXISTING PERFORMANCE												
	ΔΜ	0.66	1.4	NA		RT from Martin						
Allambie Road / Martin		0.00	(Worst: >70)	(Worst: F)	Give Wey	Luther Place						
Luther Place	DM	0.95	0.5	NA	Give way	RT from Martin						
	Pivi	0.65	(Worst: >70)	(Worst: F)		Luther Place						
	0.04	0.00	40.9	С		Through from						
Allambie Road /	AW	0.99	(Worst: >70)	(Worst: E)	Oʻrus allis ald	South						
Mortain Avenue	DM	0.01	>70	F	Signalised	Right from						
	РМ	2.01	(Worst: >70)	(Worst: F)		South						
	FUTU	RE PERFORM	ANCE (POST D	EVELOPMENT)							
	0.04	0.00	1.9	NA		RT from Martin						
Allambie Road / Martin	AW	0.66	(Worst: >70)	(Worst: F)		Luther Place						
Luther Place	DM	0.00	0.9	NA	Give way	RT from Martin						
	PIVI	0.86	(Worst: >70)	(Worst: F)		Luther Place						
	0.04	0.00	42.0	С		Through from						
Allambie Road /	Alvi	0.99	(Worst: >70)	(Worst: F)	Cianalias d	South						
Mortain Avenue	DM	0.00	>70	F	Signalised	Right from						
	PM	2.06	(Worst: >70)	(Worst: F)		South						

NOTES:

(1) Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.

(2) Average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most

disadvantaged movement.

(3) Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service,

designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.

(4) NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

As shown above the impact of this level of traffic will have very minimal adverse effect on any nearby intersections. The intersection of Allambie Road / Mortain Avenue is currently operating at a LoS of F during the PM peak period. The increase in some five through movements at the intersection represents an increase of 0.2% which will not detrimentally impact delays or queue lengths and can be readily accommodated within the existing road network.

The Intersection of Martin Luther Place / Allambie Road indicates delays for right turn movements out of the site. During peak traffic times it is expected that drivers wishing to



travel southbound from the site will turn left out of the site and travel to the roundabout intersection of Allambie Road / Aquatic Drive approximately 700m to the north of the site and perform a U-turn to return traveling south. It is emphasised that this manoeuvre will be low in frequency and is not expected to occur due to majority of vehicle trips associated with the proposed development occurring outside of network peak traffic periods.



5 CONCLUSION

In view of the foregoing, the proposed senior living development (as depicted in **Annexure A**) is fully supportable in terms of its traffic and parking impacts, subject to the required changes outlined in **Section 3.6**. The following outcomes of this traffic impact assessment are relevant to note:

- The car parking layout has been assessed to generally comply with the relevant dimensional requirements and objectives of AS2890.1, AS2890.2, AS4299 and AS2890.6, subject to the required changes outlined in **Section 3.6.** It is recommended that a design certificate be required at the Construction Certificate Stage to confirm the required changes have been implemented, as well as to account for any design changes during the Development Application process.
- The site requires the provision of 24 residential parking spaces as per the requirements of the SEPP (Housing for Seniors or people with a Disability) 2004. The development proposes a total of 30 residential car parking spaces representing a surplus of some six (6) residential spaces from the SEPP requirements. The site additionally provides 17 visitor car parking spaces where nil (0) are required which should be looked upon favourably by Council.
- The traffic generated by the site equates to 10 vehicles trips in both the AM (2 in; 8 out) and PM (8 in; 2 out) peak periods respectively. The traffic generated by the proposed development will be of a low order and will not detrimentally impact the ongoing operation of the existing road network.
- It is envisaged that the historical waste collection service that accesses the adjacent William Charlton Village site via the driveway located within the intersection of Mortain Avenue / Allambie Road is sufficient for both the existing William Charlton Village and the proposed development such that the historical operation will satisfy the requirements of the proposed development.
- It is expected that loading by vehicles up to a B99 will occur from the proposed loading bay within the lower ground floor parking area. Loading by vehicles larger than a B99 vehicle, up to and including a 6.4m length Small Rigid Vehicle is proposed to occur via access from the driveway located within the intersection of Mortain Avenue / Allambie Road.



ANNEXURE A: CONCEPT SITE PLANS (SHEET 1 OF 3)





ANNEXURE A: CONCEPT SITE PLANS (SHEET 2 OF 3)





ANNEXURE A: CONCEPT SITE PLANS (SHEET 3 OF 3)





ANNEXURE B: SURVEY DATA (SHEET 1 OF 2)

Curtis Traffic Surveys				Turning	moveme	nt count		Allambie	e Rd		
100.		ŀ	180602m	cl (18_27	3)		Peak Hour	920	26		
Day, date	е			31/05/18				Volumes	↓ `	1	77
Location:				Allambie	Rd & Mor	ain Av				F	60
Weather	:			Fine			N		121	70	
Client:				McLaren	Traffic Eng	ineering	↑			Morta	in Av
				From Aliam	bie Ka	M	· · · ·	From Allam	bie Ku		
				south		From Mort	ain Av	nortn		1 0 cai	
Tim	e Per	iod		through	right	left	right	left	through	vehicles	Peak
07:00	to	07:15		210	10	18	15	6	151	410	
07:15	to	07:30		206	13	16	17	8	146	406	
07:30	to	07:45		250	13	14	14	- 4	152	447	,
07:45	to	08:00		247	20	15	27	10	141	460	
08:00	to	08:15		263	15	18	21	10	227	554	
08:15	to	08:30		385	20	15	28	5	243	696	peak
08:30	to	08:45		319	15	17	14	4	238	607	
08.45	to	09.00	-	247	20	10	14	. 7	212	510	
Total		07100		2127	126	123	150	54	1510)	
Hourly sun	nmar	ý									
07:00	to	08:00		913	56	63	73	28	590	1723	
07:15	to	08:15		966	61	63	79	32	666	1867	,
07:30	to	08:30		1145	* 68	62	90	29	763	2157	,
07.45	to	08.45		1214	70	65	90	29	849	2317	,
08.00	to	09.00		1214	70	F 60	F 77	26	P 920	2367	peak hour
		07.00							,		
Curtis T	raffi	ic Survey	s	Turnin	ig mover	nent cou	int	Alla	mbie Ro	t	
100.				180602	mcl (18	273)		Deels Libure	1607	352	
, Day, dat	e		+	30/05/1	8	,		Volumes		$\downarrow \smile$	11
Location	:		+	Allambi	e Rd & M	ortain Av					43
Weather	r:		+	Rain				N	602	181	
Client:			t	McLare	n Traffic E	ngineerin	g	1		M	lortain Av
			t								
			T		ппріє ка	L					
			_	south		From Mor	tain Av	north		10(4)	
Tin	ne Pe	riod		through	right	left	right	left	through	vehicles	Peak
16.00	to	16.12	t	68	3 26	6	2	25	251	378	
		14.20	ŀ				-		201	477	
16:15	to	16:30	ŀ	6.	o 45	15	4	45	305	4//	
16:30	to	16:45		57	7 51	9	7	80	462	666	
16:45	to	17:00		8	I 84	- 11	3	77	282	538	
17.00	to	17.15		139	9 43	8	6	88	402	686	
			ŀ					00	102		
17:15	to	17:30	ŀ	15:	3 52	. 15	4	84	362	670	
17:30	to	17:45		145	5 46	12	0	108	412	723	peak
17:45	to	18:00	Γ	165	5 40	8	1	72	431	717	
18.00		10.15	ŀ	153				FO	410	664	
10.00	10	10.15	ŀ	15.	5 30	۳ ۲	'	30	10	700	
18:15	to	18:30		103	3 22	. 5	4	8	353	495	
18:30	to	18:45		102	2 12	. 4	3	8	219	348	
18:45	to	19:00		105	5 15	4	2	6	191	323	
Total				1334	4 474	101	37	651	4088		
Hourly su	mma	ry	+								
16:00	to	17:00		269	206	41	16	227	1300	2059	
14.15		17.15	$\left \right $	24	200	42	- 20	290		2227	
10:15	ťŌ	17:15	$\left \right $	540	223	#3	20	270	-	230/	
16:30	to	17:30		430	230	43	20	329	1508	2560	
16:45	to	17:45		518	3 225	46	13	357	1458	2617	
17:00	to	18:00		602	2 181	43	11	352	1607	2796	peak hour
17:15	to	18:15	ſ	616	5 176	39	6	314	1623	2774	
17:30	to	18.30	┢	564	5 146	29	-	238	1614	2599	
17.45		10.45	$\left \right $	500		· 21	F	120	1421	2377	
17:45	τo	10:45	ŀ	523	, 112 , P	21		138	- 1421	2224	
							10	70	1101	1020	



ANNEXURE B: SURVEY DATA (SHEET 2 OF 2)

Curtis Traffi	c Surveys	Turning	movemer	nt count				Allamb	ie Rd	
1914	180602mcl (18 273)							6	973	
Day, date		31/05/18		,		Volumes	5			
Location:	ocation: Allambie Rd & Martin Luth						12			N
Weather:		Fine			М	Luther F	PI	6	1280	1
Client:		McLaren	Traffic Engi	neering						
		From Allam	bie Rd north	From M Lut	her Pl	From Allamb	ie Rd south			
Time Pe	riod	through	right	left	right	left	through	vehicles	Peak	
07:00 to	07:15	170) I	I	l	I	218	392		
07:15 to	07:30	168	: I	2	2	0	219	392		
07:30 to	07:45	168	• 0	0	0	4	256	428		
07:45 to	08:00	155	0	0	0	1	264	420		
08:00 to	08:15	239	·	0	3	0	281	524		
08:15 to	08:30	264	0	2	. 1	0	389	656	peak	
08:30 to	08:45	251	3	I	7	2	341	605		
08:45 to	09:00	219	2	2	. 1	4	269	497		
Total		1634	8	8	15	12	2237			
Hourly summar	γ									
07:00 to	08:00	661	2	3	3	6	957	1632		
07:15 to	08:15	730	2	2	5	5	1020	1764		
07:30 to	08:30	826	1	2	4	5	1190	2028		
07:45 to	08:45	909	4	3	۳ – Li	3	1275	2205		
08:00 to	09:00	973	6	5	12	6	1280	2282	peak hour	

			_									
Curtis Traffic Surveys			Turning	moven	nent co	unt	Allambie Rd					
JUU.		1	-	180602m	ncl (18_2	73)		Peak Hour		ļ		1659
Day, dat	e			30/05/18				Volumes	10		+	
Location	:			Allambie	Rd & Ma	rtin Lutł	ner Pl		4	7		
Weathe	:			Rain				М	Luther P	1 2	T	781
Client:				McLaren	Traffic E	ngineerir	ng					
											Ν	
				n orth		Erom M I	uthor Pl		indie Ku		•	
			_	norui		FIONTIFIE		south				
Time Period			through	right	left	right	left	through	vehicles	Peak		
16:00	to	16:15		254	4	2	2	I	89	352		
16:15	to	16:30		315	0	5	2	4	101	427		
16:30	to	16:45		451	0	2	0	4	120	577		
16:45	to	17:00		301	0	2	1	3	159	466		
17:00	to	17:15		389	I	1	0	I	191	583		
17:15	to	17:30		384	I	3	2	I	199	590		
17:30	to	17:45		410	0	3	1	0	195	609		
17:45	to	18:00		425	0	2	0	0	198	625		
18:00	to	18:15		440	0	2	1	I	189	633	peak	
18:15	to	18:30		368	I.	2	2	0	130	503		
18:30	to	18:45		214	0	0	0	I	108	323		
18:45	to	19:00		201	I	0	0	0	112	314		
Total				4152	8	24	П	16	1791			
Hourly su	mmar	у										
16:00	to	17:00		32	4	1 1	5	12	469	1822		
16:15	to	17:15		1456	۲ – ۱	10	3	12	571	2053		
16:30	to	17:30		1525	2	8	3	9	669	2216		
16:45	to	17:45		1484	2	9	4	5	744	2248		
17:00	to	18:00		1608	2	9	3	2	783	2407		
17:15	to	18:15		1659	<u> </u>	10	4	2	781	2457	peak hou	ır
17:30	to	18:30		1643	۲ I	9	4	۲ I	712	2370		
17:45	to	18:45		1447	۲ ا	6	3	2	625	2084		
18:00	to	19:00		1223	2	4	3	2	539	1773		



ANNEXURE C: SIDRA INTERSECTION OUTPUTS (SHEET 1 OF 4)

MOVEMENT SUMMARY

ablaSite: 101 [Allambie/ Martin Luther AM Ex]

Allambie/ Martin Luther Site Category: (None) Giveway / Yield (Two-Way)

Move	Movement Performance - Vehicles													
Mov	T	Demand	Flows	Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Aver. No.	Average		
ID	rum	Total	ΗV	Satn	Delay	Service	Vehicles	Distance	Queued	Stop Rate	Cycles	Speed		
		veh/h	%	v/c	sec		veh	m				km/h		
South: Allambie Road South														
1	L2	6	0.0	0.660	5.7	LOS A	0.0	0.0	0.00	0.00	0.00	58.1		
2	T1	1280	0.0	0.660	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	59.6		
Approa	ach	1286	0.0	0.660	0.2	NA	0.0	0.0	0.00	0.00	0.00	59.6		
North:	Allambi	e Road No	rth											
8	T1	973	0.0	0.526	1.2	LOS A	1.0	6.8	0.06	0.00	0.09	57.7		
9	R2	6	0.0	0.526	40.8	LOS C	1.0	6.8	0.06	0.00	0.09	54.6		
Approa	ach	979	0.0	0.526	1.4	NA	1.0	6.8	0.06	0.00	0.09	57.6		
West:	Martin L	uther Place	Э											
10	L2	5	0.0	0.368	40.5	LOS C	1.0	6.7	0.98	1.01	1.08	13.4		
12	R2	12	0.0	0.368	116.8	LOS F	1.0	6.7	0.98	1.01	1.08	23.1		
Approa	ach	17	0.0	0.368	94.3	LOS F	1.0	6.7	0.98	1.01	1.08	20.3		
All Veh	nicles	2282	0.0	0.660	1.4	NA	1.0	6.8	0.03	0.01	0.05	57.5		

MOVEMENT SUMMARY

ablaSite: 101 [Allambie/ Martin Luther PM Ex]

Allambie/ Martin Luther Site Category: (None) Giveway / Yield (Two-Way)

Mover	Movement Performance - Vehicles													
Mov		Demand	Flows	Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Aver. No.	Average		
ID	rum	Total	ΗV	Satn	Delay	Service	Vehicles	Distance	Queued	Stop Rate	Cycles	Speed		
		veh/h	%	v/c	sec		veh	m				km/h		
South: Allambie Road South														
1	L2	2	0.0	0.402	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	58.3		
2	T1	781	0.0	0.402	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9		
Approa	ach	783	0.0	0.402	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9		
North:	Allambie	e Road Nor	rth											
8	T1	1659	0.0	0.852	0.0	LOS A	0.1	0.7	0.01	0.00	0.01	59.9		
9	R2	1	0.0	0.852	34.8	LOS C	0.1	0.7	0.01	0.00	0.01	56.6		
Approa	ach	1660	0.0	0.852	0.1	NA	0.1	0.7	0.01	0.00	0.01	59.9		
West:	Martin L	uther Place	Э											
10	L2	10	0.0	0.281	24.2	LOS B	0.7	4.9	0.95	1.00	1.02	14.7		
12	R2	4	0.0	0.281	226.1	LOS F	0.7	4.9	0.95	1.00	1.02	25.2		
Approa	ach	14	0.0	0.281	81.9	LOS F	0.7	4.9	0.95	1.00	1.02	17.7		
All Veh	nicles	2457	0.0	0.852	0.5	NA	0.7	4.9	0.01	0.01	0.01	58.9		



ANNEXURE C: SIDRA INTERSECTION OUTPUTS (SHEET 2 OF 4)

MOVEMENT SUMMARY

Site: 101 [Allambie/ Mortain AM Ex]

Allambie Road/ Mortain Avenue Site Category: (None) Signals - Fixed Time Isolated Cycle Time = 60 seconds (Site Optimum Cycle Time - Minimum Delay)

Move	nent P	erformanc	e - Ve	hicles								
Mov	T	Demand I	Flows	Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Aver. No.	Average
ID	Turn	Total	ΗV	Satn	Delay	Service	Vehicles	Distance	Queued	Stop Rate	Cycles	Speed
		veh/h	%	v/c	sec		veh	m				km/h
South:	Allambi	e Road So	uth									
2	T1	1214	0.0	0.990	70.1	LOS E	72.9	510.6	0.86	1.60	1.87	19.9
3	R2	70	0.0	0.250	17.1	LOS B	1.4	9.7	0.67	0.73	0.67	38.8
Approa	ach	1284	0.0	0.990	67.2	LOS E	72.9	510.6	0.85	1.56	1.81	20.5
East: N	/lortain /	Avenue										
4	L2	60	0.0	0.738	38.0	LOS C	4.4	30.9	1.00	0.89	1.27	27.8
6	R2	77	0.0	0.738	38.0	LOS C	4.4	30.9	1.00	0.89	1.27	36.2
Approa	ach	137	0.0	0.738	38.0	LOS C	4.4	30.9	1.00	0.89	1.27	33.1
North:	Allambi	e Road Nor	th									
7	L2	26	0.0	0.020	8.4	LOS A	0.2	1.6	0.32	0.63	0.32	51.4
8	T1	920	0.0	0.681	5.5	LOS A	15.3	107.2	0.61	0.56	0.61	51.8
Approa	ach	946	0.0	0.681	5.6	LOS A	15.3	107.2	0.61	0.56	0.61	51.8
All Veh	icles	2367	0.0	0.990	40.9	LOS C	72.9	510.6	0.76	1.12	1.30	28.0

MOVEMENT SUMMARY

Site: 101 [Allambie/ Mortain PM Ex]

Allambie Road/ Mortain Avenue Site Category: (None) Signals - Fixed Time Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Move	ment Pe	erformanc	e - Ve	hicles								
Mov	T	Demand F	Flows	Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Aver. No.	Average
ID	Turn	Total	ΗV	Satn	Delay	Service	Vehicles	Distance	Queued	Stop Rate	Cycles	Speed
		veh/h	%	v/c	sec		veh	m				km/h
South:	Allambi	e Road Sou	uth									
2	T1	602	0.0	0.386	2.8	LOS A	7.5	52.6	0.31	0.28	0.31	55.6
3	R2	181	0.0	2.057	1936.4	LOS F	84.9	594.1	1.00	4.13	11.46	1.0
Approa	ach	783	0.0	2.057	449.7	LOS F	84.9	594.1	0.47	1.17	2.89	4.3
East: N	Aortain A	venue										
4	L2	43	0.0	0.436	52.4	LOS D	2.5	17.2	1.00	0.74	1.00	23.4
6	R2	11	0.0	0.436	52.3	LOS D	2.5	17.2	1.00	0.74	1.00	31.7
Approa	ach	54	0.0	0.436	52.4	LOS D	2.5	17.2	1.00	0.74	1.00	25.4
North:	Allambie	e Road Nor	th									
7	L2	352	0.0	0.237	7.9	LOS A	3.7	26.2	0.26	0.66	0.26	51.8
8	T1	1607	0.0	1.192	389.0	LOS F	315.6	2209.2	1.00	3.69	4.45	4.9
Approa	ach	1959	0.0	1.192	320.6	LOS F	315.6	2209.2	0.87	3.15	3.70	6.6
All Ver	nicles	2796	0.0	2.057	351.6	LOS F	315.6	2209.2	0.76	2.55	3.42	5.8



ANNEXURE C: SIDRA INTERSECTION OUTPUTS (SHEET 3 OF 4)

MOVEMENT SUMMARY

♥ Site: 101 [Allambie/ Martin Luther AM Fut]

Allambie/ Martin Luther Site Category: (None) Giveway / Yield (Two-Way)

Move	ment P	erformanc	e - Ve	ehicles								
Mov	Turn	Demand	Flows Deg.		Average	Level of	95% Back of Queue		Prop.	Effective	Aver. No.	Average
ID	Turn	Total	ΗV	Satn	Delay	Service	Vehicles	Distance	Queued	Stop Rate	Cycles	Speed
		veh/h	%	v/c	sec		veh	m				km/h
South:	Allamb	ie Road So	uth									
1	L2	7	0.0	0.660	5.7	LOS A	0.0	0.0	0.00	0.00	0.00	58.1
2	T1	1280	0.0	0.660	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	59.6
Approa	ach	1287	0.0	0.660	0.2	NA	0.0	0.0	0.00	0.00	0.00	59.6
North:	Allambi	e Road Nor	th									
8	T1	973	0.0	0.531	1.4	LOS A	1.1	8.0	0.08	0.00	0.10	57.3
9	R2	7	0.0	0.531	40.9	LOS C	1.1	8.0	0.08	0.00	0.10	54.3
Approa	ach	980	0.0	0.531	1.7	NA	1.1	8.0	0.08	0.00	0.10	57.2
West:	Martin L	uther Place	;									
10	L2	9	0.0	0.503	52.5	LOS D	1.4	9.6	0.98	1.03	1.16	12.8
12	R2	16	0.0	0.503	130.2	LOS F	1.4	9.6	0.98	1.03	1.16	22.0
Approa	ach	25	0.0	0.503	102.2	LOS F	1.4	9.6	0.98	1.03	1.16	18.7
All Veh	nicles	2292	0.0	0.660	1.9	NA	1.4	9.6	0.04	0.02	0.06	56.6

MOVEMENT SUMMARY

ablaSite: 101 [Allambie/ Martin Luther PM Fut]

Allambie/ Martin Luther Site Category: (None) Giveway / Yield (Two-Way)

Mover	ment Pe	erformanc	e - Ve	hicles								
Mov	T	Demand	Flows	Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Aver. No.	Average
ID	Turn	Total	ΗV	Satn	Delay	Service	Vehicles	Distance	Queued	Stop Rate	Cycles	Speed
		veh/h	%	v/c	sec		veh	m				km/h
South:	Allambi	e Road So	uth									
1	L2	6	0.0	0.404	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	58.2
2	T1	781	0.0	0.404	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approa	ach	787	0.0	0.404	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
North:	Allambie	e Road Nor	rth									
8	T1	1659	0.0	0.858	0.2	LOS A	0.6	3.9	0.04	0.00	0.05	59.4
9	R2	5	0.0	0.858	35.6	LOS C	0.6	3.9	0.04	0.00	0.05	56.2
Approa	ach	1664	0.0	0.858	0.3	NA	0.6	3.9	0.04	0.00	0.05	59.4
West:	Martin L	uther Place	Э									
10	L2	11	0.0	0.357	37.2	LOS C	0.9	6.4	0.96	1.01	1.07	12.8
12	R2	5	0.0	0.357	244.8	LOS F	0.9	6.4	0.96	1.01	1.07	22.1
Approa	ach	16	0.0	0.357	102.1	LOS F	0.9	6.4	0.96	1.01	1.07	15.8
All Veh	nicles	2467	0.0	0.858	0.9	NA	0.9	6.4	0.03	0.01	0.04	58.2



ANNEXURE C: SIDRA INTERSECTION OUTPUTS (SHEET 4 OF 4)

MOVEMENT SUMMARY

Site: 101 [Allambie/ Mortain AM Fut]

Allambie Road/ Mortain Avenue Site Category: (None) Signals - Fixed Time Isolated Cycle Time = 65 seconds (Site Optimum Cycle Time - Minimum Delay)

Mover	nent P	erformanc	e - Ve	hicles								
Mov	T	Demand I	Flows	Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Aver. No.	Average
ID	Turn	Total	ΗV	Satn	Delay	Service	Vehicles	Distance	Queued	Stop Rate	Cycles	Speed
		veh/h	%	v/c	sec		veh	m				km/h
South:	Allambi	e Road So	uth									
2	T1	1218	0.0	0.991	71.9	LOS F	76.1	532.8	0.85	1.54	1.79	19.6
3	R2	70	0.0	0.253	17.6	LOS B	1.5	10.3	0.66	0.73	0.66	38.5
Approa	ach	1288	0.0	0.991	69.0	LOS E	76.1	532.8	0.84	1.49	1.73	20.1
East: N	/lortain /	Avenue										
4	L2	60	0.0	0.685	39.0	LOS C	4.6	32.4	1.00	0.85	1.16	27.4
6	R2	77	0.0	0.685	39.0	LOS C	4.6	32.4	1.00	0.85	1.16	35.8
Approa	ach	137	0.0	0.685	39.0	LOS C	4.6	32.4	1.00	0.85	1.16	32.7
North:	Allambi	e Road Nor	th									
7	L2	26	0.0	0.020	8.5	LOS A	0.2	1.7	0.31	0.63	0.31	51.4
8	T1	921	0.0	0.675	5.7	LOS A	16.2	113.1	0.60	0.55	0.60	51.6
Approa	ach	947	0.0	0.675	5.7	LOS A	16.2	113.1	0.59	0.55	0.59	51.6
All Veh	icles	2372	0.0	0.991	42.0	LOS C	76.1	532.8	0.75	1.08	1.24	27.6

MOVEMENT SUMMARY

Site: 101 [Allambie/ Mortain PM Fut]

Allambie Road/ Mortain Avenue Site Category: (None) Signals - Fixed Time Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Move	ment Pe	erformanc	e - Ve	hicles								
Mov	T	Demand F	lows	Deg.	Average	Level of	95% Back	of Queue	Prop.	Effective	Aver. No.	Average
ID	Turn	Total	ΗV	Satn	Delay	Service	Vehicles	Distance	Queued	Stop Rate	Cycles	Speed
		veh/h	%	v/c	sec		veh	m				km/h
South:	Allambi	e Road Sou	uth									
2	T1	603	0.0	0.387	2.8	LOS A	7.5	52.7	0.31	0.28	0.31	55.6
3	R2	181	0.0	2.057	1936.4	LOS F	84.9	594.1	1.00	4.13	11.46	1.0
Approa	ach	784	0.0	2.057	449.2	LOS F	84.9	594.1	0.47	1.17	2.89	4.3
East: N	Aortain A	Venue										
4	L2	43	0.0	0.436	52.4	LOS D	2.5	17.2	1.00	0.74	1.00	23.4
6	R2	11	0.0	0.436	52.3	LOS D	2.5	17.2	1.00	0.74	1.00	31.7
Approa	ach	54	0.0	0.436	52.4	LOS D	2.5	17.2	1.00	0.74	1.00	25.4
North:	Allambie	e Road Nor	th									
7	L2	352	0.0	0.237	7.9	LOS A	3.7	26.2	0.26	0.66	0.26	51.8
8	T1	1611	0.0	1.192	389.9	LOS F	316.8	2217.5	1.00	3.70	4.46	4.9
Approa	ach	1963	0.0	1.192	321.4	LOS F	316.8	2217.5	0.87	3.15	3.70	6.5
All Veh	nicles	2801	0.0	2.057	352.0	LOS F	316.8	2217.5	0.76	2.55	3.42	5.8



ANNEXURE D: SWEPT PATH TESTS

(Sheet 1 of 11)



AUSTRALIAN STANDARD 85TH PERCENTILE SIZE VEHICLE (B85)



AUSTRALIAN STANDARD 99.8TH PERCENTILE SIZE VEHICLE (B99)

Blue – Tyre Path Green – Vehicle Body Red – 300mm Clearance





AUSTRALIAN STANDARD SMALL RIGID VEHICLE (SRV)



AUSTRALIAN STANDARD MEDIUM RIGID VEHICLE (MRV)

Blue – Tyre Path Green – Vehicle Body Red – 500mm Clearance



ANNEXURE D: SWEPT PATH TESTS (Sheet 3 of 11)



GENERAL NSWFB FIRE TRUCK

Blue – Tyre Path Green – Vehicle Body Red – 500mm Clearance





B85 passing B99 at intersection of Martin Luther Lane / Site Access Lane Tested @ 10km/h Successful



ANNEXURE D: SWEPT PATH TESTS (Sheet 5 of 1)

B85 passing B99 at intersection of Site Access Lane / Site Driveway Tested @ 10km/h Successful





10.1m General Appliance EXIT along bushfire emergency egress road Tested @ 5km/h Successful











MRV EXIT along William Charlton Village roadway Tested @ 5km/h Successful





MRV Entry – William Charlton Village driveway Tested @ 5km/h Unsuccessful





SRV Entry - William Charlton Village driveway Tested @ 5km/h Successful





SRV Loading and Manoeuvring Tested @ 5km/h internally Total of 3 Manoeuvres Successful

Note: The turning bay could potentially be reduced by up to a maximum of 4.0m in length





ANNEXURE E: STOP SIGN CONCEPT