TRAFFIC AND TRANSPORT
ENGINEERING CONSULTANTS

GOLD COAST
27 Paradise Ave Miami Qld 4220
P: (07) 5527 7333 **F:** (07) 5527 7555
Postal: PO Box 441 Mermaid Beach Qld 4218

BRISBANE
Level 36 Riparian Plaza 71 Eagle St Brisbane Qld 4000
P: (07) 3121 3198 **F:** (07) 3121 3030

SYDNEY
Level 26, 44 Market St Sydney NSW 2000
P: (02) 9089 8752 **F:** (02) 9089 8842

E: info@crg.net.au **www.crg.net.au**

CRG Traffic Pty Ltd ACN 151 846 847
In association with CRG Acoustics Pty Ltd

Proposed Rezoning
Lot 101 Ewingsdale Road, Ewingsdale
Lot 101 DP 1140936

TRAFFIC IMPACT ASSESSMENT

Prepared For

Jewelbond Pty Ltd

7 March 2013
crgref: 10505t

DOCUMENT REGISTER

NUMBER	ISSUE	AUTHOR	PROJECT DIRECTOR
3	7 March 2013	Chris Levers BE (Civil)	 Luke Rytenskild BE (Civil), RPEQ

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1 INTRODUCTION

CRG Traffic Pty Ltd has been engaged by Jewelbond Pty Ltd to undertake a Traffic Impact Assessment of a planning proposal to rezone the subject land to allow for development of various commercial uses including an aged care facility, medical centre and retail shops.

It is intended that this report be lodged with the Byron Shire Council. This Traffic Impact Assessment report addresses the following issues:

- Impact of the proposed rezoning upon the operation of the local road network, including the amenity of local residential streets;
- What road upgrades would be required to facilitate future development under the proposed rezoning;
- Access requirements for each precinct;
- Requirements for additional public transport services and pedestrian / bicycle pathways.

2 PROPOSED DEVELOPMENT

2.1 Subject Site

The subject site is known as Lot 101 DP1140936, Ewingsdale Road, Ewingsdale. It comprises two parcels of land with the eastern parcel (6.99ha) fronting McGettigans Lane and the western parcel (8.09ha) fronting William Flick Lane.

Figure 2.1 – Location of Subject Site

2.2 Proposed Rezoning

The subject Planning Proposal seeks a change to the present zoning and related controls to facilitate the development of various residential and commercial uses on the site including an aged care facility, medical centre and retail shops.

The western parcel of land fronting William Flick Lane is intended to be developed for Seniors Living and Retail purposes as follows:

- Seniors Living 100 lots (averaging 250m^2)
- Retail 2,500m^2
- Medical Centre 600m^2
- Aged Care Facility 60 beds

Vehicular access to this precinct would be via separate access points in William Flick Lane for the retail / commercial and residential components.

The eastern parcel off McGettigans Lane will be developed for Seniors Living with approximately 66 lots. Vehicular access to this component of the development would be via a single access point in McGettigans Lane.

3 EXISTING ROAD AND TRAFFIC CONDITIONS

3.1 Existing Roadway Conditions

Ewingsdale Road functions as an arterial road and provides for movement between the Pacific Highway and the Byron Bay town centre. The speed limit on Ewingsdale Road in the vicinity of the subject site is 100 Km / Hr.

William Flick Lane (Old Pacific Highway) is a two-way rural road with a pavement width of approximately eight metres in the vicinity of the subject site. It is a local road and with a primary function of providing access to adjoining rural property. It is estimated that William Flick Lane currently carries less than 300 vehicles per day.

The Ewingsdale Road / William Flick Lane intersection consists of an unsignalised four way layout with Ewingsdale Road having priority. A dedicated turning lane is provided for each right turn movement to the Old Pacific Highway.

McGettigans Lane is a two way rural road with a pavement width of approximately 7.5 metres in the vicinity of the subject site. Its primary function is to provide access to adjoining rural property and residential neighbourhoods. It is estimated that the McGettigans Lane currently carries in the order of 1,300 – 1,500 vehicles per day at is northern end. McGettigans Lane has a speed limit of 50 Km / Hr.

The Ewingsdale Road / McGettigans Lane intersection consists of a modified 'seagull' layout. A full 'seagull' intersection cannot be achieved due to the proximity of a side road to the east. A left turn deceleration lane is provided in the westbound approach to McGettigans Lane.

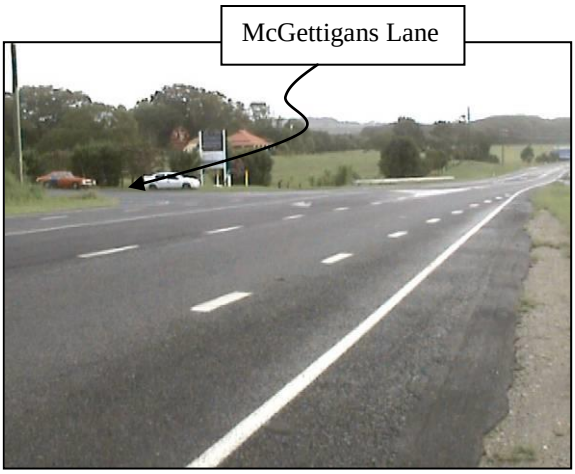
Images of the local road network are shown in Figure 3.1.

3.2 Existing Traffic Volumes

CRG conducted a survey of traffic volumes at the intersections of Ewingsdale Road & William Flick Lane and Ewingsdale Road & McGettigans Lane. The surveys were conducted on during February 2013. The results of the survey are presented in full in Appendix A and are summarised in Figure 3.2.

3.3 Future Traffic Volumes

Population growth in the area is expected to occur at a rate of approximately 1% p.a. However, in order to estimate the future background traffic volumes, a 3% p.a. growth rate has been applied to the through movements on Ewingsdale Road. This will result in a conservative estimate of future traffic volumes. Resultant estimates of future (2024) peak hour traffic movements through the road network are shown in Figure 3.3.



Ewingsdale Rd – looking west

McGettigans Lane approach to Ewingsdale Road

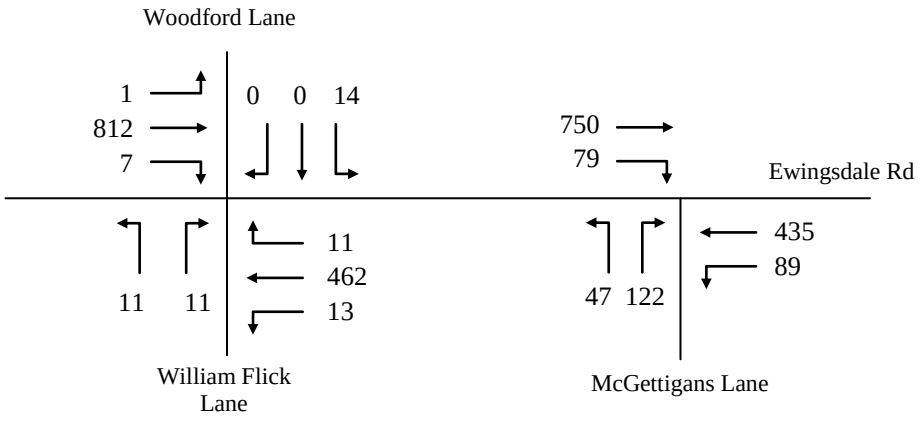
Ewingsdale Rd eastbound approach to McGettigans Lane

McGettigans Lane – looking south from Ewingsdale Road

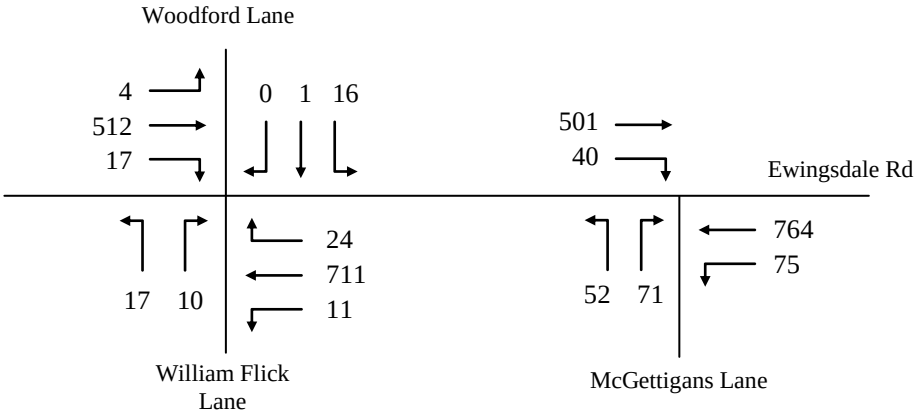
Ewingsdale Rd / William Flick Lane Intersection Looking west

William Flick Lane – looking Nth to Ewingsdale Rd

Figure 3.1: Images of the Local Road Network



AM Peak Hour



PM Peak Hour

Figure 3.2 –Surveyed Traffic Volumes (February 2013)

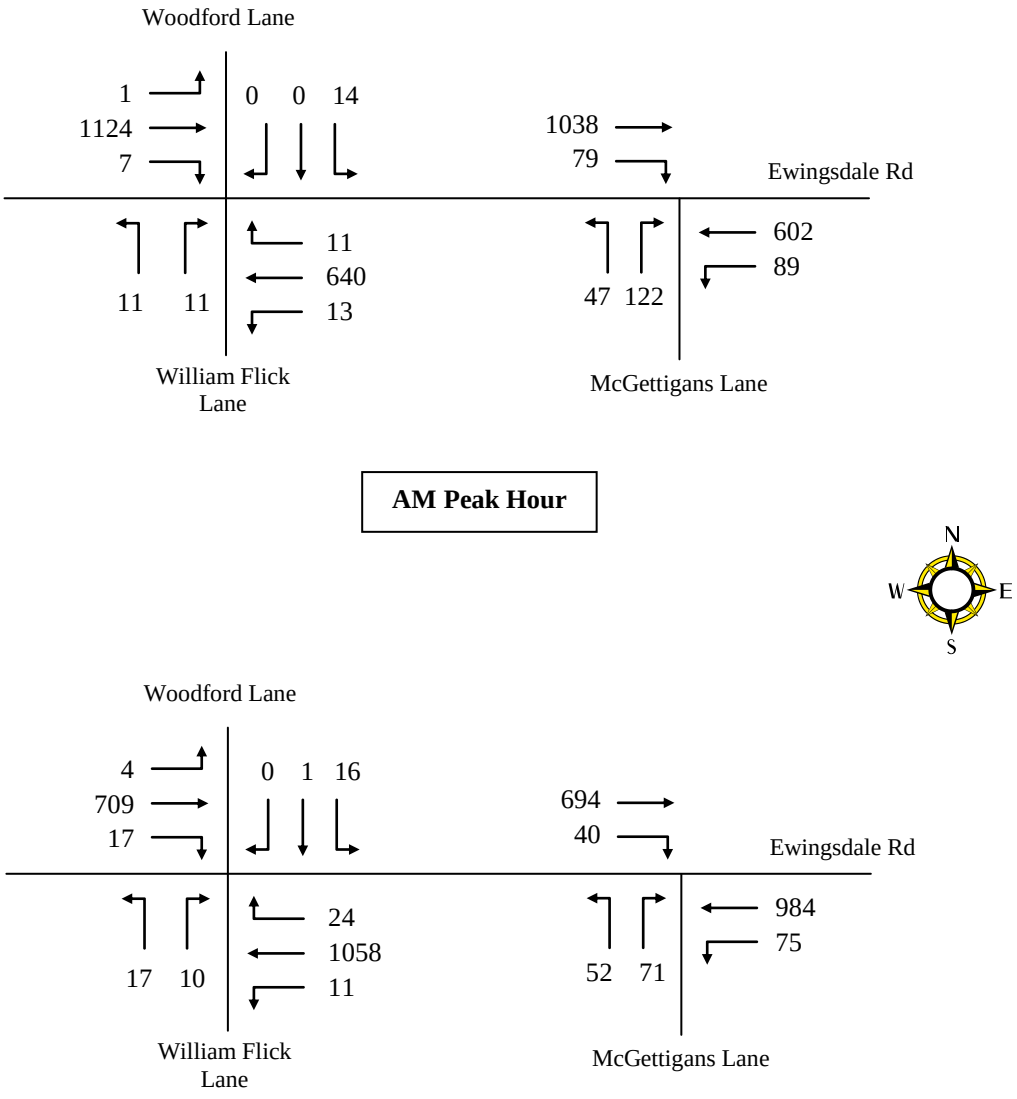


Figure 3.3 – Projected Future (2024) Peak Hour Traffic Volumes

3.4 Pacific Highway Upgrade

The Pacific Highway is currently being upgraded over a length of approximately 17 km between Ross Lane in Tintenbar and extending north to the Ewingsdale interchange. As part of this upgrade, the Ewingsdale interchange is being retained and improved to include:

- A new direct southbound on-ramp on the eastern side of the interchange, connected to the south side of the roundabout in Ewingsdale Road.
- Retaining the existing southbound off-ramp but with some re-alignment.

Figure 3.4 shows a concept plan of the Ewingsdale Interchange upgrade as shown in the 'Tintenbar to Ewingsdale Upgrade - Environmental Assessment Report' prepared by the Roads and Traffic Authority.

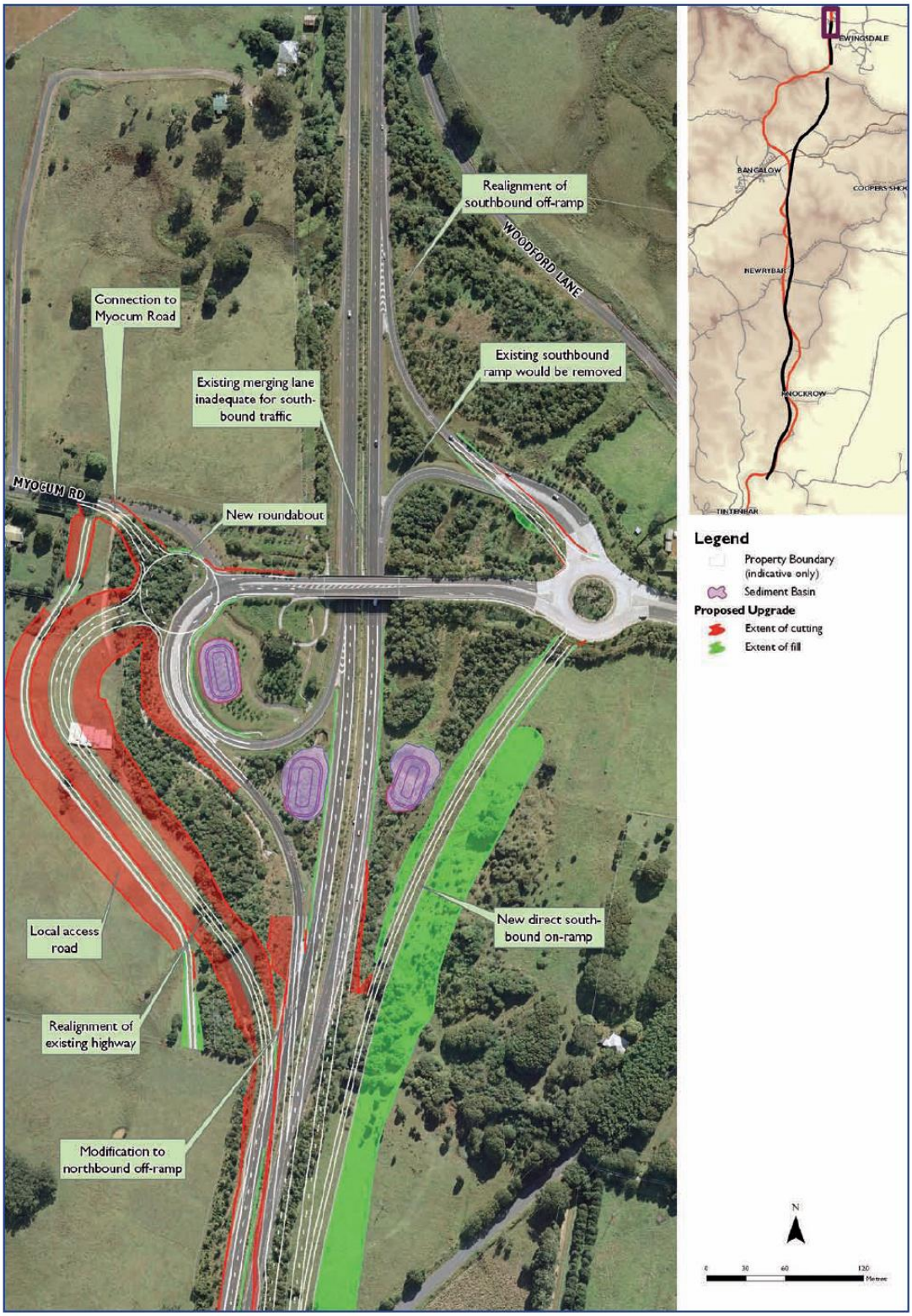


Figure 3.4: Ewingsdale Interchange – Current Upgrade Work

4 DEVELOPMENT TRAFFIC

4.1 Trip Generation

An indication of the traffic generation potential of the development proposal is provided by reference to the Department of Main Roads publication *Road Planning and Design Manual, Appendix 3A –Trip Generation Rates (December 2005).* The following rates are applicable to the proposed development:

Retirement / Aged Homes
Peak Hour: 0.2 trips per dwelling / room

Retail (0 – 10,000m^2)
Peak Hour: 12.3 trips per 100m^2

Medical Centre
Peak Hour: 13 trips per 100m^2

The proportion of linked-trips (passing trade) to retail development is typically in the order of 25%. Application of the above rates to the proposed development yields the following peak period traffic generation potential:

Table 4.1: Traffic Generation

Component	Morning Peak Hour			Afternoon Peak Hour		
	In	Out	Total	In	Out	Total
Seniors Living / Aged Care						
Western Precinct	6	26	32	19	13	32
Eastern Precinct	3	11	14	8	6	14
Medical Centre (600m^2)	59	15	74	37	37	74
Retail (1,200m^2)						
Primary Trips	55	55	110	55	55	110
Passing Trade	19	19	38	19	19	38
Total	**142**	**126**	**268**	**138**	**130**	**268**

However, it is also considered appropriate to apply an overall discount of 25% to the retail and medical centre uses since these components will attract a significant proportion of trade from the associated seniors living / aged care residents. The resultant traffic generation potential is shown below in Table 4.2:

Table 4.2: Traffic Generation (With 25% Discount Applied to Retail / Medical Centre)

Component	Morning Peak Hour			Afternoon Peak Hour		
	In	Out	Total	In	Out	Total
Seniors Living / Aged Care						
Western Precinct	5	20	25	15	10	25
Eastern Precinct	3	11	14	8	6	14
Medical Centre (350m^2)	44	12	56	28	28	56
Retail (1,200m^2)						
Primary Trips	41	41	82	41	41	82
Passing Trade	14	14	28	14	14	28
Total	**107**	**98**	**205**	**106**	**99**	**205**

4.2 Trip Distribution

Based on a review of the surrounding road network and land use pattern, it is estimated that the proposed development traffic will distribute as follows:

To / from the west via Ewingsdale Road -	30%
To / from the east via Ewingsdale Road -	70%
Total	**100%**

The resultant net increase in traffic volumes at the Ewingsdale Road / William Flick Lane and Ewingsdale Road / McGettigans Lane intersections are shown in Figure 4.1.

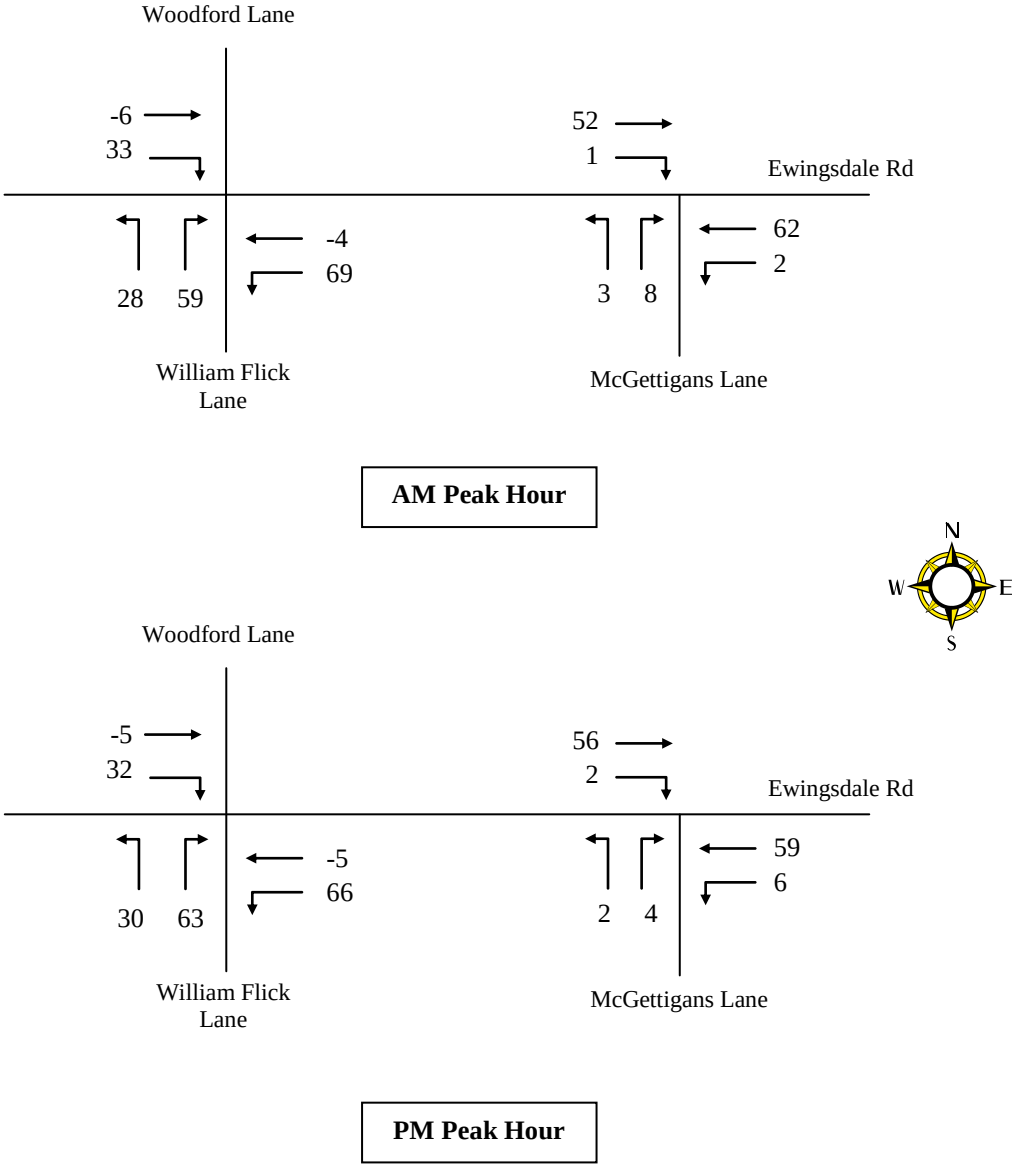


Figure 4.1 – Development Traffic Volumes

5 TRAFFIC IMPACT ASSESSMENT

5.1 Scope of Assessment

The impact of the proposed uses upon the Ewingsdale Road / William Flick Lane / Woodford Lane and Ewingsdale Road / McGettigans Lane intersections has been modelled using SIDRA software.

The assessment has considered both morning and afternoon traffic conditions and projected future (year 2024) traffic conditions.

Criteria for evaluating the results of SIDRA analysis are provided in Appendix B.

5.2 Ewingsdale Road / William Flick Lane / Woodford Lane

The Ewingsdale Road / William Flick Lane / Woodford Lane intersection has been modelled using SIDRA under current and projected future (year 2024) traffic conditions, without and with the proposed development.

The results of the SIDRA analysis of the intersection are presented in full in Appendix C and are summarised below.

Table 5.1: SIDRA Results for Ewingsdale Rd / William Flick Ln / Woodford Ln

Existing Intersection Scenario	Degree Of Saturation	Average Delay (sec)	Right Turn Delay out of William Flick Ln (sec)	95th Percentile Queue (vehicles)
AM 2013 Without Development	0.425	1.0	53.5	0.4
AM 2013 With Development	0.963	9.5	176.2	6.0
AM 2024 Without Development	0.588	1.9	203.4	1.2
AM 2024 With Development	1.167	11.3	288.8	10.5
PM 2013 Without Development	0.372	1.3	50.8	0.3
PM 2013 With Development	0.938	9.4	157.7	5.6
PM 2024 Without Development	0.553	2.0	215.4	1.2
PM 2024 With Development	1.217	13.2	324.1	12.3

As noted above, delays for vehicles turning right out of William Flick Lane will steadily worsen over the next 10 years as background traffic volumes in Ewingsdale Road increase. This will occur regardless of the proposed development.

The provision of a roundabout would provide adequate capacity for existing and future traffic conditions. CRG has prepared a concept plan of a possible roundabout treatment at the intersection, which is shown in Figure 5.1 overleaf.

Figure 5.1: Roundabout Concept Plan for the Ewingsdale Road / William Flick Lane Intersection

CRG has conducted a SIDRA analysis of the roundabout presented in Figure 5.1. The roundabout has been modelled under future 2024 traffic conditions with the proposed development traffic. The results are presented in full in Appendix C and are summarised below.

Table 5.2: SIDRA Results for Ewingsdale Rd / William Flick Ln / Woodford Ln (Roundabout)

Roundabout Scenario	Degree Of Saturation	Average Delay (sec)	Right Turn Delay out of William Flick Ln (sec)	95th Percentile Queue (vehicles)
AM 2024 With Development	0.432	4.7	13.6	3.3
PM 2024 With Development	0.408	4.9	15.0	2.9

As shown above, a roundabout treatment would perform satisfactorily reducing vehicle delays and queue lengths in William Flick Lane and Woodford Lane. Due to the low turning movement volumes at the intersection, delays and queuing in each Ewingsdale Road approach would be minimal.

The proposed roundabout would be relatively costly to construct, however, would facilitate safe access to Woodford Lane and existing development in William Flick Lane. It would also facilitate safe access to future development on Lot 100 located between the subject properties (Lot 101). It is considered, therefore, that it would be reasonable for Council to include the cost of the roundabout in its Section 94 works schedule.

5.3 Ewingsdale Road / McGettigans Lane

The Ewingsdale Road / McGettigans Lane intersection has been modelled using SIDRA under current and projected future (year 2024) traffic conditions, without and with the proposed development.

The results of the SIDRA analysis of the intersection are presented in full in Appendix C and are summarised below.

Table 5.3: SIDRA Results for Ewingsdale Rd / McGettigans Ln

Existing Intersection Scenario	Degree Of Saturation	Average Delay (sec)	Total Right Turn Delay out of McGettigans Ln (sec)	95th Percentile Queue (vehicles)
AM 2013 Without Development	0.392	2.9	18.0	0.8
AM 2013 With Development	0.419	3.0	19.1	1.0
AM 2024 Without Development	0.543	2.6	20.8	1.1
AM 2024 With Development	0.570	2.8	22.4	1.3
PM 2013 Without Development	0.399	2.4	21.7	0.7
PM 2013 With Development	0.430	2.4	23.3	0.8
PM 2024 Without Development	0.514	2.3	27.4	1.0
PM 2024 With Development	0.545	2.4	29.9	1.1

As shown above, the existing intersection will operate satisfactorily for the foreseeable future with the proposed development traffic, with satisfactory delays and vehicle queuing on all approaches and movements.

It is therefore concluded that the proposal will not have any adverse impact upon this intersection.

6 SITE ACCESS

6.1 Western Precinct - William Flick Lane

Vehicular access to this precinct would be via separate access points in William Flick Lane for the retail / commercial and residential components.

Approximate turning movement volumes at the access intersection in 2024 are shown below in Figure 6.1.

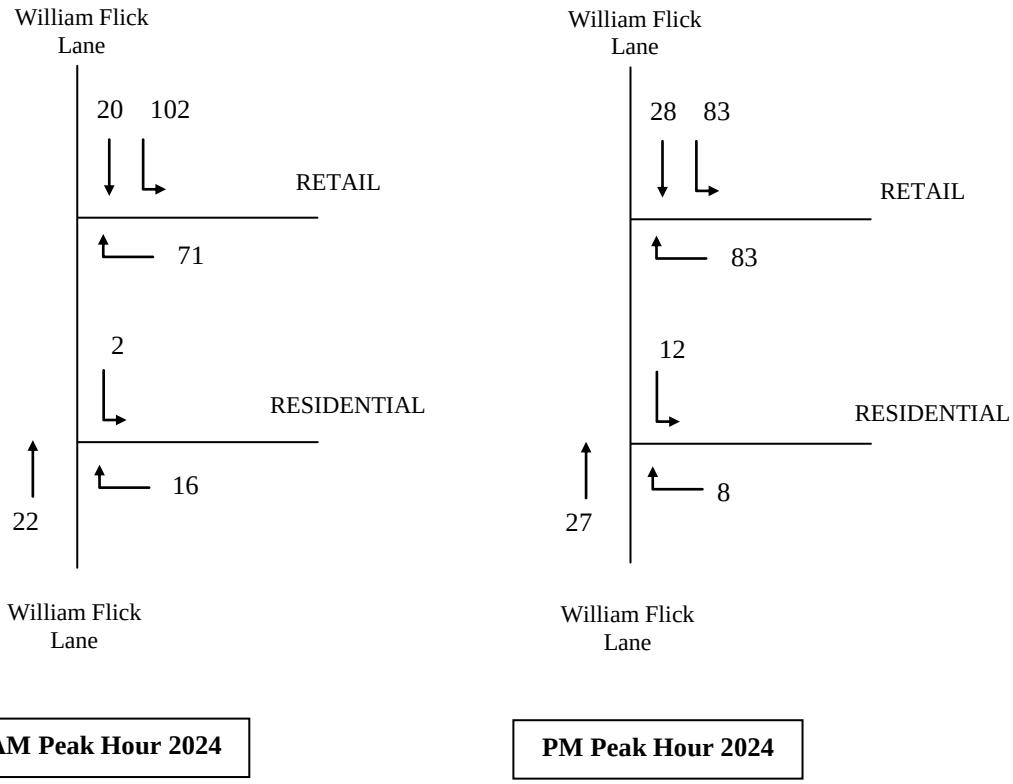


Figure 6.1: Estimated Turning Movement Volumes

Given that right turn volumes into the subject site at this location will be insignificant, there will be no requirement for a dedicated right turn lane in William Flick Lane at the proposed access. As shown in Figure 6.2, the estimated left turn volume into the site does not warrant a dedicated left turn lane.

It is therefore concluded that no auxiliary turning lanes will be required to facilitate safe access to the subject site from William Flick Lane.

There are no sight distance constraints along the William Flick Lane frontage of the site.

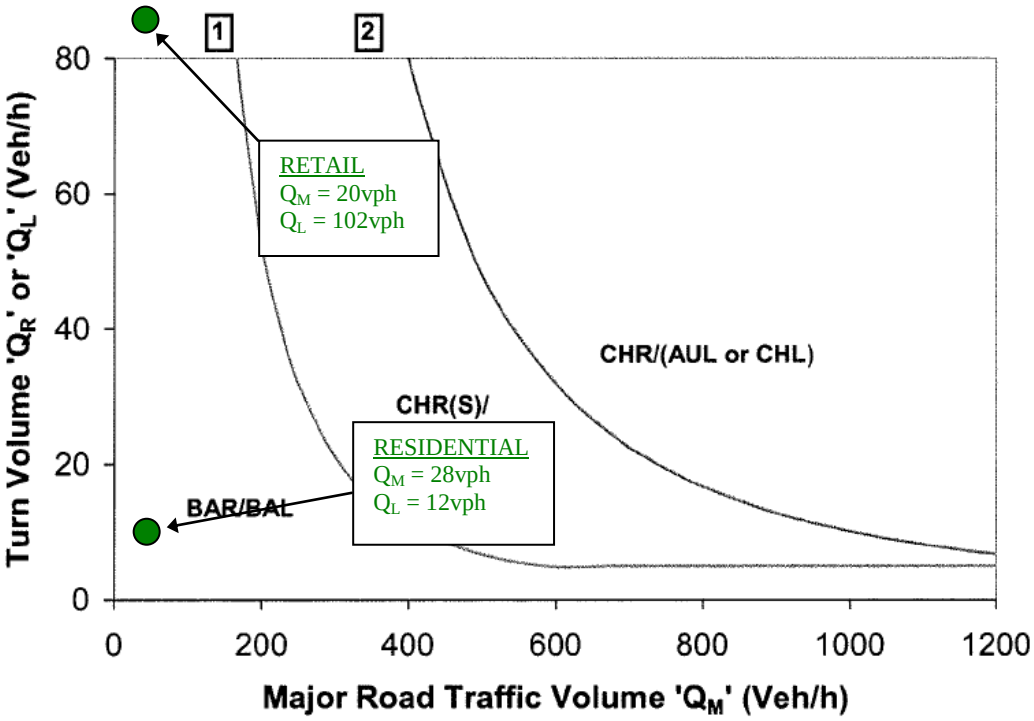


Figure 6.2: Warrants for Turning Lanes (From Austroads Part 4A)

6.2 Eastern Precinct – McGettigans Lane

Vehicular access to this component of the development would be via a single access point in McGettigans Lane.

Approximate turning movement volumes at the access intersection in 2024 are shown below in Figure 6.3.

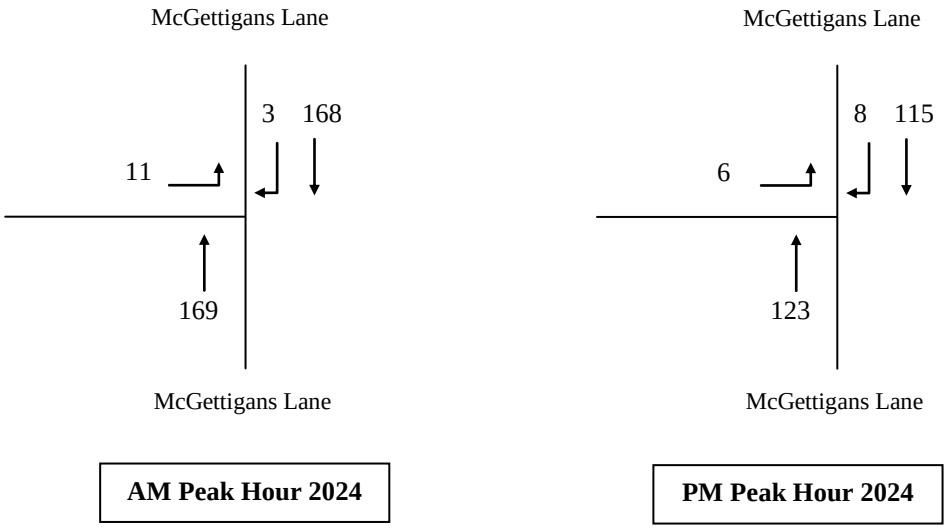


Figure 6.3: Estimated Turning Movement Volumes

Given that left turn volumes into the subject site at this location will be insignificant, there will be no requirement for a dedicated left turn lane in McGettigans Lane at the proposed access. As shown in Figure 6.4, the estimated right turn volume into the site does not warrant a dedicated right turn lane.

It is therefore concluded that no auxiliary turning lanes will be required to facilitate safe access to the subject site from McGettigans Lane.

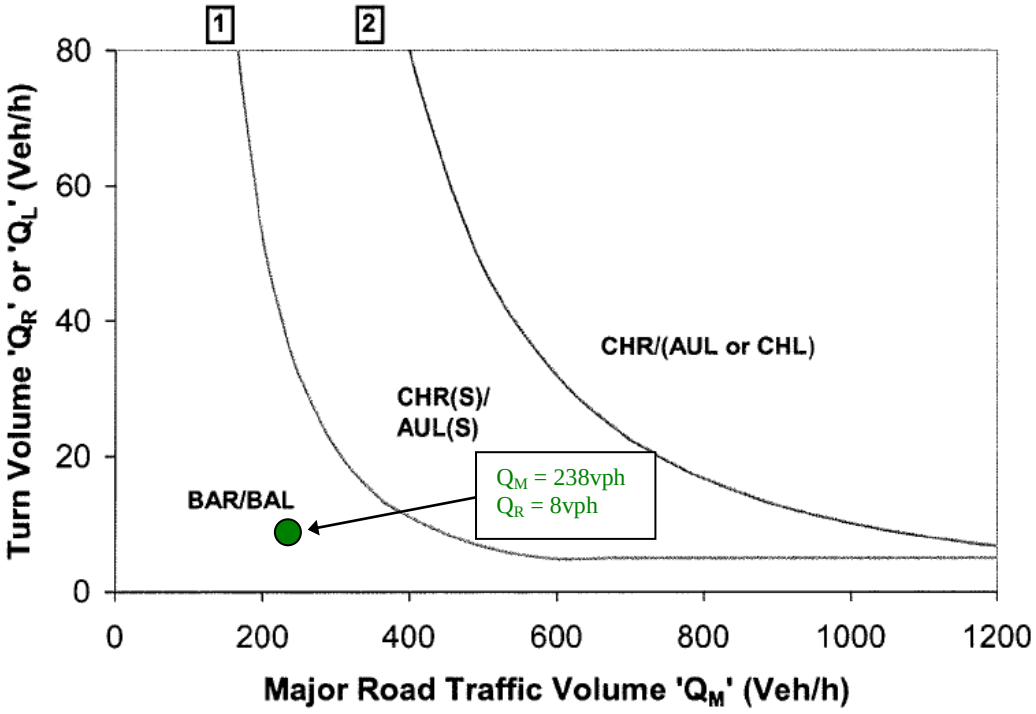


Figure 6.4: Warrants for Turning Lanes (From Austroads Part 4A)

It is noted that any access off McGettigans Lane will need to be located towards the northern end of the site due to sight distance constraints associated with horizontal and vertical curves located at the southern end of the site.

7 SUMMARY OF CONCLUSIONS & RECOMMENDATIONS

- The subject site is known as Lot 101 DP1140936 Ewingsdale Road, Ewingsdale. It comprises two parcels of land with the eastern parcel (6.99ha) fronting McGettigans Lane and the western parcel (8.09ha) fronting William Flick Lane.

- The subject Planning Proposal seeks a change to the present zoning and related controls to facilitate the development of various commercial uses on the site including an aged care facility, medical centre and retail shops. The western parcel of land fronting William Flick Lane is intended to be developed for Seniors Living, Retail, Medical Centre and Aged Care. The Eastern precinct is intended to be developed for Seniors Living.

- Vehicular access to the western precinct would be via separate access points in William Flick Lane for the retail / commercial and residential components. Access to the eastern precinct would be via a single access point in McGettigans Lane

- It is estimated that the proposed development will generate 205 peak hour vehicle trips.

- A SIDRA analysis of the existing Ewingsdale Road / William Flick Lane intersection reveals that delays for vehicles turning right out of William Flick Lane will steadily worsen over the next 10 years as background traffic volumes in Ewingsdale Road increase. This will occur regardless of the proposed development. The intersection will therefore require upgrading in the future regardless of the proposed development. The provision of a roundabout would provide adequate capacity for existing and future traffic conditions.

- The proposed roundabout would be relatively costly to construct, however, would facilitate safe access to Woodford Lane and existing development in William Flick Lane. It would also facilitate safe access to future development on Lot 100 located between the subject properties (Lot 101). It is considered, therefore, that it would be reasonable for Council to include the cost of the roundabout in its Section 94 works schedule.

- SIDRA analysis of the existing Ewingsdale Road / McGettigans Lane intersection indicates that it will operate satisfactorily for the foreseeable future with the proposed development traffic, with satisfactory delays and vehicle queuing on all approaches and movements.

- Dedicated turning lanes are not required in William Flick Lane or McGettigans Lane to facilitate safe access to the proposed development.

APPENDIX A

Traffic Survey Data:

(a) Ewingsdale Road / William Flick Lane / Woodford Lane
(b) Ewingsdale Road / McGettigans Lane

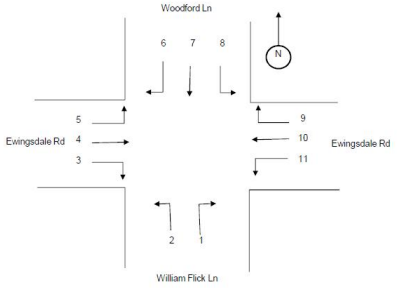
Intersection Count

Date: Thursday 28 February 2013
Address: Ewingsdale Rd / William Flick Ln, Byron Bay
Name: Chris Ryan
Intersection Type: 4-way
Job no: 10505

TIME	MOVEMENT											
	1	2	3	4	5	6	7	8	9	10	11	TOTAL
6:00 - 6:15	2	4	7	109	0	0	0	5	4	65	3	199
6:15 - 6:30	4	3	3	111	0	0	0	2	4	79	2	208
6:30 - 6:45	2	1	3	120	1	0	0	1	3	81	4	216
6:45 - 7:00	1	2	5	213	1	0	0	4	0	141	2	369
7:00 - 7:15	1	2	2	163	0	0	1	3	3	93	1	269
7:15 - 7:30	0	4	1	211	0	0	0	4	1	101	1	323
7:30 - 7:45	1	2	1	191	0	0	0	6	4	108	3	316
7:45 - 8:00	3	2	3	231	0	0	0	2	3	104	2	350
8:00 - 8:15	7	3	2	179	1	0	0	2	3	149	7	353
8:15 - 8:30	2	2	4	187	0	0	0	5	3	113	2	318
8:30 - 8:45	1	4	2	179	1	1	1	3	5	131	2	330
8:45 - 9:00	1	3	3	161	0	0	0	2	3	107	3	283
9:00 - 9:15	3	1	2	143	1	0	0	9	4	134	2	299
9:15 - 9:30	1	1	3	141	1	0	0	3	6	110	4	270
9:30 - 9:45	4	2	3	143	0	1	0	1	5	132	1	292
9:45 - 10:00	2	3	2	139	0	0	0	1	5	141	2	295
10:00 - 10:15	BREAK											0
10:15 - 10:30												0
10:30 - 10:45	3	2	1	123	0	0	0	2	6	128	2	267
10:45 - 11:00	3	8	2	158	0	2	0	4	5	126	3	311
11:00 - 11:15	4	5	2	147	0	0	0	3	6	129	4	300
11:15 - 11:30	2	6	1	136	0	1	0	2	5	162	2	317
11:30 - 11:45	3	3	1	109	0	0	0	2	4	107	1	230
11:45 - 12:00	1	1	2	116	1	0	1	8	6	121	1	258
12:00 - 12:15	1	2	1	151	1	1	0	2	6	106	2	273
12:15 - 12:30	0	2	2	108	0	0	0	3	5	109	3	232
12:30 - 12:45	1	3	3	121	0	1	0	4	6	110	4	253
12:45 - 1:00	1	2	2	145	0	0	0	6	5	121	6	288
1:00 - 1:15	2	2	1	103	0	0	0	2	5	147	4	266
1:15 - 1:30	0	4	0	113	0	0	1	4	2	140	4	268
1:30 - 1:45	1	3	1	114	0	0	0	2	6	171	3	301
1:45 - 2:00	1	3	1	123	0	0	0	3	4	151	2	288
2:00 - 2:15	BREAK											0
2:15 - 2:30												0
2:30 - 2:45	3	2	6	122	0	0	0	3	7	123	2	268
2:45 - 3:00	2	6	5	133	1	0	0	3	7	171	3	331
3:00 - 3:15	3	5	4	135.3	2	0	0	8	5	235	4	401.3
3:15 - 3:30	2	4	2	122	1	0	1	2	5	182	2	323
3:30 - 3:45	2	4	1	127	0	0	0	4	4	206	2	349
3:45 - 4:00	3	2	2	125	1	0	0	3	9	183	3	331
4:00 - 4:15	2	3	2	119	1	1	0	3	5	193	2	331
4:15 - 4:30	3	3	1	142	0	0	0	4	5	215	2	375

1 HOUR SUMMARY

TIME	MOVEMENT											
	1	2	3	4	5	6	7	8	9	10	11	TOTAL
6:00 - 7:00	9	10	18	553	2	0	0	12	11	366	11	992
6:15 - 7:15	8	8	13	607	2	0	1	10	10	394	9	1062
6:30 - 7:30	4	9	11	707	2	0	1	12	7	416	8	1177
6:45 - 7:45	3	10	9	778	1	0	1	17	8	443	7	1277
7:00 - 8:00	5	10	7	796	0	0	1	15	11	406	7	1258
7:15 - 8:15	11	11	7	812	1	0	0	14	11	462	13	1342
7:30 - 8:30	13	9	10	788	1	0	0	15	13	474	14	1337
7:45 - 8:45	13	11	11	776	2	1	1	12	14	497	13	1351
8:00 - 9:00	11	12	11	706	2	1	1	12	14	500	14	1284
8:15 - 9:15	7	10	11	670	2	1	1	19	15	485	9	1230
8:30 - 9:30	6	9	10	624	3	1	1	17	18	482	11	1182
8:45 - 9:45	9	7	11	588	2	1	0	15	18	483	10	1144
9:00 - 10:00	10	7	10	566	2	1	0	14	20	517	9	1156
9:15 - 10:15	7	6	8	423	1	1	0	5	16	383	7	857
9:30 - 10:30	6	5	5	282	0	1	0	2	10	273	3	587
9:45 - 10:45	5	5	3	262	0	0	0	3	11	269	4	562
10:00 - 11:00	6	10	3	281	0	2	0	6	11	254	5	578
10:15 - 11:15	10	15	5	428	0	2	0	9	17	383	9	878
10:30 - 11:30	12	21	6	564	0	3	0	11	22	545	11	1195
10:45 - 11:45	12	22	6	550	0	3	0	11	20	524	10	1158
11:00 - 12:00	10	15	6	508	1	1	1	15	21	519	8	1105
11:15 - 12:15	7	12	5	512	2	2	1	14	21	496	6	1078
11:30 - 12:30	5	8	6	484	2	1	1	15	21	443	7	993
11:45 - 12:45	3	8	8	496	2	2	1	17	23	446	10	1016
12:00 - 1:00	3	9	8	525	1	2	0	15	22	446	15	1046
12:15 - 1:15	4	9	8	477	0	1	0	15	21	487	17	1039
12:30 - 1:30	4	11	6	482	0	1	1	16	18	518	18	1075
12:45 - 1:45	4	11	4	475	0	0	1	14	18	579	17	1123
1:00 - 2:00	4	12	3	453	0	0	1	11	17	609	13	1123
1:15 - 2:15	2	10	2	350	0	0	1	9	12	462	9	857
1:30 - 2:30	2	6	2	237	0	0	0	5	10	322	5	589
1:45 - 2:45	4	5	7	245	0	0	0	6	11	274	4	556
2:00 - 3:00	5	8	11	255	1	0	0	6	14	294	5	599
2:15 - 3:15	8	13	15	390.3	3	0	0	14	19	529	9	1000.3
2:30 - 3:30	10	17	17	512.3	4	0	1	16	24	711	11	1323.3
2:45 - 3:45	9	19	12	517.3	4	0	1	17	21	793	11	1404.3
3:00 - 4:00	10	15	9	509.3	4	0	1	17	23	805	11	1404.3
3:15 - 4:15	9	13	7	493	3	1	1	12	23	763	9	1334
3:30 - 4:30	10	12	6	513	2	1	0	14	23	796	9	1386



Intersection Count

Date: Wednesday 27 February 2013

Address: Ewingsdale Rd / McGettigans Ln, Byron Ba

Name: Chris Ryan

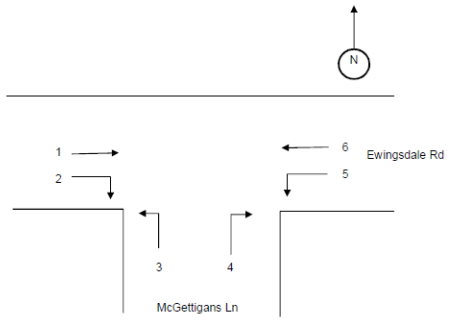
Intersection Ty T-Junction

Job no: 10505

TIME	MOVEMENT						
	1	2	3	4	5	6	TOTAL
6:00 - 6:15	108	4	4	4	11	65	**196**
6:15 - 6:30	112	4	6	9	12	78	**221**
6:30 - 6:45	107	12	8	21	9	83	**240**
6:45 - 7:00	205	9	4	10	9	127	**364**
7:00 - 7:15	154	10	6	16	8	93	**287**
7:15 - 7:30	99	26	2	23	13	91	**254**
7:30 - 7:45	175	23	9	31	26	102	**366**
7:45 - 8:00	203	31	13	23	24	95	**389**
8:00 - 8:15	189	14	14	39	16	132	**404**
8:15 - 8:30	183	11	11	29	23	106	**363**
8:30 - 8:45	169	7	7	22	17	131	**353**
8:45 - 9:00	158	6	11	18	22	95	**310**
9:00 - 9:15	149	4	4	19	11	116	**303**
9:15 - 9:30	135	10	6	33	23	124	**331**
9:30 - 9:45	142	6	7	5	15	127	**302**
9:45 - 10:00	129	8	8	12	10	131	**298**
10:00 - 10:15	BREAK						**0**
10:15 - 10:30							**0**
10:30 - 10:45	121	3	5	11	11	131	**282**
10:45 - 11:00	161	3	5	11	21	122	**324**
11:00 - 11:15	147	3	9	18	16	127	**321**
11:15 - 11:30	131	5	6	11	15	159	**328**
11:30 - 11:45	113	2	5	18	12	110	**260**
11:45 - 12:00	124	4	6	12	15	115	**277**
12:00 - 12:15	153	9	2	12	17	108	**302**
12:15 - 12:30	111	5	6	22	13	110	**268**
12:30 - 12:45	123	6	13	6	15	102	**265**
12:45 - 1:00	147	5	6	10	8	123	**300**
1:00 - 1:15	113	3	6	9	5	141	**277**
1:15 - 1:30	109	5	5	11	14	135	**279**
1:30 - 1:45	99	18	2	15	18	177	**330**
1:45 - 2:00	119	11	17	26	23	134	**330**
2:00 - 2:15	BREAK						**0**
2:15 - 2:30							**0**
2:30 - 2:45	118	11	12	22	28	116	**307**
2:45 - 3:00	132	15	19	25	29	155	**375**
3:00 - 3:15	131	6	11	13	17	231	**410**
3:15 - 3:30	117	12	9	19	15	177	**349**
3:30 - 3:45	121	7	13	14	14	201	**370**
3:45 - 4:00	121	7	11	16	17	179	**351**
4:00 - 4:15	117	3	10	12	20	185	**348**
4:15 - 4:30	133	14	10	15	19	209	**401**

HOURLY SUMMARY

TIME	MOVEMENT						
	1	2	3	4	5	6	TOTAL
6:00 - 7:00	532	29	22	44	41	353	**1021**
6:15 - 7:15	578	35	24	56	38	381	**1112**
6:30 - 7:30	565	57	20	70	39	394	**1145**
6:45 - 7:45	633	68	21	80	56	413	**1272**
7:00 - 8:00	631	90	30	93	71	381	**1297**
7:15 - 8:15	666	94	38	116	79	420	**1413**
7:30 - 8:30	750	79	47	122	89	435	**1522**
7:45 - 8:45	744	63	45	113	80	464	**1509**
8:00 - 9:00	699	38	43	108	78	464	**1430**
8:15 - 9:15	659	28	33	88	73	448	**1329**
8:30 - 9:30	611	27	28	92	73	466	**1297**
8:45 - 9:45	584	26	28	75	71	462	**1247**
9:00 - 10:00	555	28	25	69	59	498	**1235**
9:15 - 10:15	406	24	21	50	48	382	**931**
9:30 - 10:30	271	14	15	17	25	258	**601**
9:45 - 10:45	250	11	13	23	21	262	**581**
10:00 - 11:00	282	6	10	22	33	253	**606**
10:15 - 11:15	429	9	19	41	49	380	**927**
10:30 - 11:30	560	14	25	52	64	539	**1254**
10:45 - 11:45	552	13	25	59	65	518	**1232**
11:00 - 12:00	515	14	26	60	59	511	**1185**
11:15 - 12:15	521	20	19	54	60	492	**1166**
11:30 - 12:30	501	20	19	64	58	443	**1106**
11:45 - 12:45	511	24	27	53	61	435	**1111**
12:00 - 1:00	534	25	27	50	54	444	**1134**
12:15 - 1:15	494	19	31	47	42	477	**1110**
12:30 - 1:30	492	19	30	36	43	501	**1121**
12:45 - 1:45	468	31	19	45	46	576	**1186**
1:00 - 2:00	440	37	30	61	61	587	**1216**
1:15 - 2:15	327	34	24	52	56	446	**939**
1:30 - 2:30	218	29	19	41	42	311	**660**
1:45 - 2:45	237	22	29	48	51	250	**637**
2:00 - 3:00	250	26	31	47	56	271	**681**
2:15 - 3:15	381	32	42	60	73	502	**1091**
2:30 - 3:30	498	44	51	79	89	679	**1440**
2:45 - 3:45	501	40	52	71	75	764	**1504**
3:00 - 4:00	490	32	44	62	64	788	**1481**
3:15 - 4:15	476	29	43	61	67	742	**1419**
3:30 - 4:30	492	31	44	57	71	774	**1470**



APPENDIX B: Criteria for Interpreting Results of SIDRA Analysis

1. *Level of Service (LOS)*

LOS	Traffic Signals and Roundabouts	Give Way and Stop Signs
'A'		Good operation.
'B'	Good operation. Good with acceptable delays and spare capacity.	Acceptable delays and spare capacity.
'C'	Satisfactory.	Satisfactory but accident study required.
'D'	Operating near capacity.	Near capacity and accident study required.
'E'	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode.	At capacity and requires other control mode.
'F'	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode.

2. *Average Vehicle Delay (AVD)*

The AVD provides a measure of the operational performance of an intersection as indicated on the table below which relates AVD to LOS. The AVD's listed in the table should be taken as a guide only as longer delays could be tolerated in some locations (i.e. inner city conditions) and on some roads (ie minor side street intersecting with a major arterial route).

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

3. *Degree of Saturation (DS)*

The DS is another measure of the operational performance of individual intersections.

For intersections controlled by **traffic signals**[1] both queue length and delay increase rapidly as DS approaches 1, and it is usual to attempt to keep DS to less than 0.9. Values of DS in the order of 0.7 generally represent satisfactory intersection operation. When DS exceeds 0.9 queues can be anticipated.

For intersections controlled by a **roundabout or GIVE WAY or STOP signs**, satisfactory intersection operation is indicated by a DS of 0.8 or less.

1 *The values of DS for intersections under traffic signal control are only valid for cycle length of 120 secs.*

APPENDIX C - SIDRA Results

MOVEMENT SUMMARY

Site: AM 2013 Without development

Ewingsdale Road & William Flick Lane
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: William Flick Lane											
1	L	11	0.0	0.024	13.2	LOS B	0.1	0.4	0.46	0.87	44.8
3	R	11	0.0	0.133	53.5	LOS F	0.4	2.7	0.92	1.00	24.8
Approach		22	0.0	0.133	33.3	LOS D	0.4	2.7	0.69	0.93	31.9
East: Ewingsdale Rd E											
4	L	13	0.0	0.007	8.2	LOS A	0.0	0.0	0.00	0.67	49.0
5	T	462	3.0	0.242	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R	11	0.0	0.022	14.1	LOS B	0.1	0.5	0.66	0.84	43.2
Approach		486	2.9	0.242	0.5	NA	0.1	0.5	0.02	0.04	59.1
North: Woodford Lane											
7	L	14	0.0	0.041	16.8	LOS C	0.1	0.7	0.64	0.96	42.1
8	T	1	0.0	0.021	46.3	LOS E	0.1	0.4	0.90	1.00	27.0
9	R	1	0.0	0.021	46.2	LOS E	0.1	0.4	0.90	1.00	27.0
Approach		16	0.0	0.041	20.5	LOS C	0.1	0.7	0.67	0.96	39.3
West: Ewingsdalel Rd W											
10	L	1	0.0	0.001	7.6	LOS A	0.0	0.0	0.05	0.58	49.5
11	T	812	3.0	0.425	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	7	0.0	0.008	10.3	LOS B	0.0	0.2	0.46	0.66	46.7
Approach		820	3.0	0.425	0.1	NA	0.0	0.2	0.00	0.01	59.8
All Vehicles		1344	2.8	0.425	1.0	NA	0.4	2.7	0.03	0.04	58.4

MOVEMENT SUMMARY

Site: PM 2013 Without development

Ewingsdale Road & William Flick Lane
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: William Flick Lane											
1	L	17	0.0	0.045	15.6	LOS C	0.1	0.8	0.58	0.94	42.9
3	R	10	0.0	0.113	50.8	LOS F	0.3	2.4	0.91	1.00	25.6
Approach		27	0.0	0.113	28.6	LOS D	0.3	2.4	0.70	0.96	34.3
East: Ewingsdale Rd E											
4	L	11	0.0	0.006	8.2	LOS A	0.0	0.0	0.00	0.67	49.0
5	T	711	3.0	0.372	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R	24	0.0	0.030	10.9	LOS B	0.1	0.8	0.50	0.73	46.1
Approach		746	2.9	0.372	0.5	NA	0.1	0.8	0.02	0.03	59.2
North: Woodford Lane											
7	L	16	0.0	0.036	13.6	LOS B	0.1	0.6	0.49	0.89	44.5
8	T	1	0.0	0.020	44.5	LOS E	0.1	0.4	0.90	1.00	27.6
9	R	1	0.0	0.020	44.4	LOS E	0.1	0.4	0.90	1.00	27.6
Approach		18	0.0	0.036	17.0	LOS C	0.1	0.6	0.53	0.90	41.7
West: Ewingsdalel Rd W											
10	L	4	0.0	0.004	7.7	LOS A	0.0	0.1	0.08	0.57	49.3
11	T	512	3.0	0.268	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	17	0.0	0.026	12.2	LOS B	0.1	0.7	0.57	0.77	44.9
Approach		533	2.9	0.268	0.4	NA	0.1	0.7	0.02	0.03	59.3
All Vehicles		1324	2.8	0.372	1.3	NA	0.3	2.4	0.04	0.06	58.1

MOVEMENT SUMMARY

Site: AM 2024 Without development

Ewingsdale Road & William Flick Lane
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: William Flick Lane											
1	L	11	0.0	0.027	14.8	LOS B	0.1	0.5	0.54	0.91	43.6
3	R	11	0.0	0.448	203.4	LOS F	1.2	8.7	0.98	1.03	9.2
Approach		22	0.0	0.448	109.1	LOS F	1.2	8.7	0.76	0.97	15.1
East: Ewingsdale Rd E											
4	L	13	0.0	0.007	8.2	LOS A	0.0	0.0	0.00	0.67	49.0
5	T	640	3.0	0.335	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R	11	0.0	0.047	22.5	LOS C	0.1	1.0	0.84	0.95	37.0
Approach		664	2.9	0.335	0.5	NA	0.1	1.0	0.01	0.03	59.1
North: Woodford Lane											
7	L	14	0.0	0.053	22.7	LOS C	0.2	1.2	0.79	1.00	37.9
8	T	1	0.0	0.067	122.4	LOS F	0.2	1.2	0.97	1.00	13.9
9	R	1	0.0	0.067	122.3	LOS F	0.2	1.2	0.97	1.00	13.9
Approach		16	0.0	0.067	35.2	LOS E	0.2	1.2	0.81	1.00	31.2
West: Ewingsdalel Rd W											
10	L	1	0.0	0.001	7.6	LOS A	0.0	0.0	0.05	0.58	49.5
11	T	1124	3.0	0.588	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	7	0.0	0.010	11.5	LOS B	0.0	0.2	0.54	0.71	45.5
Approach		1132	3.0	0.588	0.1	NA	0.0	0.2	0.00	0.00	59.9
All Vehicles		1834	2.9	0.588	1.9	NA	1.2	8.7	0.02	0.03	57.1

MOVEMENT SUMMARY

Site: PM 2024 Without development

Ewingsdale Road & William Flick Lane
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: William Flick Lane											
1	L	17	0.0	0.058	21.3	LOS C	0.2	1.3	0.76	1.00	38.9
3	R	10	0.0	0.438	215.4	LOS F	1.2	8.5	0.99	1.03	8.7
Approach		27	0.0	0.438	93.2	LOS F	1.2	8.5	0.85	1.01	17.0
East: Ewingsdale Rd E											
4	L	11	0.0	0.006	8.2	LOS A	0.0	0.0	0.00	0.67	49.0
5	T	1058	3.0	0.553	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R	24	0.0	0.040	12.8	LOS B	0.1	1.0	0.60	0.82	44.3
Approach		1093	2.9	0.553	0.4	NA	0.1	1.0	0.01	0.02	59.4
North: Woodford Lane											
7	L	16	0.0	0.042	15.5	LOS C	0.1	0.7	0.58	0.94	43.0
8	T	1	0.0	0.072	131.2	LOS F	0.2	1.3	0.97	1.00	13.2
9	R	1	0.0	0.072	131.1	LOS F	0.2	1.3	0.97	1.00	13.2
Approach		18	0.0	0.072	28.4	LOS D	0.2	1.3	0.62	0.95	34.3
West: Ewingsdalel Rd W											
10	L	4	0.0	0.004	7.7	LOS A	0.0	0.1	0.08	0.57	49.3
11	T	709	3.0	0.371	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	17	0.0	0.043	16.3	LOS C	0.1	1.0	0.73	0.91	41.4
Approach		730	2.9	0.371	0.4	NA	0.1	1.0	0.02	0.02	59.3
All Vehicles		1868	2.8	0.553	2.0	NA	1.2	8.5	0.03	0.05	56.9

MOVEMENT SUMMARY

Site: AM 2013 With development

Ewingsdale Road & William Flick Lane
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: William Flick Lane											
1	L	39	0.0	0.087	13.6	LOS B	0.2	1.4	0.49	0.92	44.5
3	R	70	0.0	0.963	176.2	LOS F	6.0	41.9	1.00	1.40	10.3
Approach		109	0.0	0.963	118.0	LOS F	6.0	41.9	0.81	1.23	14.3
East: Ewingsdale Rd E											
4	L	82	0.0	0.044	8.2	LOS A	0.0	0.0	0.00	0.67	49.0
5	T	458	3.0	0.239	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R	11	0.0	0.022	14.0	LOS B	0.1	0.5	0.66	0.83	43.3
Approach		551	2.5	0.239	1.5	NA	0.1	0.5	0.01	0.12	57.6
North: Woodford Lane											
7	L	14	0.0	0.040	16.7	LOS C	0.1	0.7	0.63	0.96	42.1
8	T	1	0.0	0.024	52.2	LOS F	0.1	0.5	0.92	1.00	25.2
9	R	1	0.0	0.024	52.1	LOS F	0.1	0.5	0.92	1.00	25.2
Approach		16	0.0	0.040	21.2	LOS C	0.1	0.7	0.67	0.96	38.8
West: Ewingsdalel Rd W											
10	L	1	0.0	0.001	7.6	LOS A	0.0	0.0	0.05	0.58	49.5
11	T	806	3.0	0.421	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	40	0.0	0.049	10.9	LOS B	0.2	1.3	0.50	0.74	46.1
Approach		847	2.9	0.421	0.5	NA	0.2	1.3	0.02	0.04	59.1
All Vehicles		1523	2.5	0.963	9.5	NA	6.0	41.9	0.08	0.16	47.7

MOVEMENT SUMMARY

Site: PM 2013 With development

Ewingsdale Road & William Flick Lane
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: William Flick Lane											
1	L	47	0.0	0.127	16.2	LOS C	0.3	2.3	0.61	1.00	42.5
3	R	73	0.0	0.938	157.7	LOS F	5.6	39.3	0.99	1.37	11.3
Approach		120	0.0	0.938	102.3	LOS F	5.6	39.3	0.85	1.23	15.9
East: Ewingsdale Rd E											
4	L	77	0.0	0.041	8.2	LOS A	0.0	0.0	0.00	0.67	49.0
5	T	706	3.0	0.369	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R	24	0.0	0.029	10.8	LOS B	0.1	0.7	0.50	0.73	46.2
Approach		807	2.6	0.369	1.1	NA	0.1	0.7	0.01	0.09	58.2
North: Woodford Lane											
7	L	16	0.0	0.036	13.6	LOS B	0.1	0.6	0.48	0.89	44.6
8	T	1	0.0	0.023	49.9	LOS E	0.1	0.5	0.91	1.00	25.8
9	R	1	0.0	0.023	49.8	LOS E	0.1	0.5	0.91	1.00	25.8
Approach		18	0.0	0.036	17.6	LOS C	0.1	0.6	0.53	0.90	41.2
West: Ewingsdalel Rd W											
10	L	4	0.0	0.004	7.7	LOS A	0.0	0.1	0.08	0.57	49.3
11	T	507	3.0	0.265	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	49	0.0	0.081	12.9	LOS B	0.3	2.1	0.60	0.85	44.2
Approach		560	2.7	0.265	1.2	NA	0.3	2.1	0.05	0.08	58.1
All Vehicles		1505	2.4	0.938	9.4	NA	5.6	39.3	0.10	0.18	47.8

MOVEMENT SUMMARY

Site: AM 2024 With development

Ewingsdale Road & William Flick Lane
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: William Flick Lane											
1	L	39	0.0	0.100	15.4	LOS C	0.2	1.7	0.57	0.97	43.1
3	R	70	0.0	1.167	288.8	LOS F	10.5	73.4	1.00	1.71	6.7
Approach		109	0.0	1.167	191.0	LOS F	10.5	73.4	0.85	1.45	9.7
East: Ewingsdale Rd E											
4	L	82	0.0	0.044	8.2	LOS A	0.0	0.0	0.00	0.67	49.0
5	T	636	3.0	0.333	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R	11	0.0	0.046	22.2	LOS C	0.1	1.0	0.84	0.95	37.1
Approach		729	2.6	0.333	1.3	NA	0.1	1.0	0.01	0.09	58.0
North: Woodford Lane											
7	L	14	0.0	0.052	22.6	LOS C	0.2	1.1	0.79	1.00	38.0
8	T	1	0.0	0.080	143.1	LOS F	0.2	1.5	0.98	1.00	12.3
9	R	1	0.0	0.080	143.0	LOS F	0.2	1.5	0.98	1.00	12.3
Approach		16	0.0	0.080	37.6	LOS E	0.2	1.5	0.81	1.00	30.1
West: Ewingsdalel Rd W											
10	L	1	0.0	0.001	7.6	LOS A	0.0	0.0	0.05	0.58	49.5
11	T	1118	3.0	0.585	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	40	0.0	0.061	12.3	LOS B	0.2	1.6	0.57	0.81	44.8
Approach		1159	2.9	0.585	0.4	NA	0.2	1.6	0.02	0.03	59.3
All Vehicles		2013	2.6	1.167	11.3	NA	10.5	73.4	0.07	0.14	45.8

MOVEMENT SUMMARY

Site: PM 2024 With development

Ewingsdale Road & William Flick Lane
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: William Flick Lane											
1	L	47	0.0	0.167	22.6	LOS C	0.5	3.8	0.80	1.00	38.0
3	R	73	0.0	1.217	324.1	LOS F	12.3	85.9	1.00	1.81	6.1
Approach		120	0.0	1.217	206.0	LOS F	12.3	85.9	0.92	1.50	9.1
East: Ewingsdale Rd E											
4	L	77	0.0	0.041	8.2	LOS A	0.0	0.0	0.00	0.67	49.0
5	T	1053	3.0	0.551	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6	R	24	0.0	0.040	12.7	LOS B	0.1	1.0	0.59	0.82	44.4
Approach		1154	2.7	0.551	0.8	NA	0.1	1.0	0.01	0.06	58.7
North: Woodford Lane											
7	L	16	0.0	0.042	15.5	LOS C	0.1	0.7	0.57	0.94	43.0
8	T	1	0.0	0.086	153.2	LOS F	0.2	1.6	0.98	1.00	11.6
9	R	1	0.0	0.086	153.1	LOS F	0.2	1.6	0.98	1.00	11.6
Approach		18	0.0	0.086	30.8	LOS D	0.2	1.6	0.62	0.94	33.1
West: Ewingsdalel Rd W											
10	L	4	0.0	0.004	7.7	LOS A	0.0	0.1	0.08	0.57	49.3
11	T	704	3.0	0.368	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	49	0.0	0.136	17.7	LOS C	0.5	3.2	0.78	0.93	40.2
Approach		757	2.8	0.368	1.2	NA	0.5	3.2	0.05	0.06	58.1
All Vehicles		2049	2.6	1.217	13.2	NA	12.3	85.9	0.09	0.15	44.1

MOVEMENT SUMMARY

Site: Roundabout AM 2024
With development

Ewingsdale Road & William Flick Lane
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: William Flick Lane											
1	L	39	0.0	0.122	7.1	LOS A	0.5	3.7	0.55	0.64	48.4
2	T	1	0.0	0.122	6.1	LOS A	0.5	3.7	0.55	0.56	48.5
3	R	70	0.0	0.122	13.6	LOS B	0.5	3.7	0.55	0.81	45.1
Approach		110	0.0	0.122	11.2	LOS B	0.5	3.7	0.55	0.75	46.2
East: Ewingsdale Rd E											
4	L	82	0.0	0.259	5.1	LOS A	1.6	11.3	0.17	0.46	51.8
5	T	636	3.0	0.259	3.9	LOS A	1.6	11.3	0.18	0.34	52.9
6	R	11	0.0	0.259	11.4	LOS B	1.2	8.7	0.19	0.91	47.0
Approach		729	2.6	0.259	4.2	LOS A	1.6	11.3	0.18	0.36	52.7
North: Woodford Lane											
7	L	14	0.0	0.024	9.0	LOS A	0.1	0.8	0.69	0.70	48.0
8	T	1	0.0	0.024	7.9	LOS A	0.1	0.8	0.69	0.66	47.9
9	R	1	0.0	0.024	15.4	LOS B	0.1	0.8	0.69	0.84	44.2
Approach		16	0.0	0.024	9.3	LOS A	0.1	0.8	0.69	0.70	47.7
West: Ewingsdalel Rd W											
10	L	1	0.0	0.432	5.4	LOS A	3.3	23.8	0.30	0.49	51.0
11	T	1118	3.0	0.432	4.2	LOS A	3.3	23.8	0.32	0.38	51.7
12	R	40	0.0	0.432	11.8	LOS B	2.4	17.1	0.34	0.83	47.0
Approach		1159	2.9	0.432	4.4	LOS A	3.3	23.8	0.32	0.40	51.5
All Vehicles		2014	2.6	0.432	4.7	LOS A	3.3	23.8	0.28	0.40	51.5

MOVEMENT SUMMARY

Site: Roundabout PM 2024
With development

Ewingsdale Road & William Flick Lane
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: William Flick Lane											
1	L	47	0.0	0.166	8.6	LOS A	0.8	5.3	0.67	0.76	47.4
2	T	1	0.0	0.166	7.5	LOS A	0.8	5.3	0.67	0.70	47.4
3	R	73	0.0	0.166	15.0	LOS B	0.8	5.3	0.67	0.91	44.0
Approach		121	0.0	0.166	12.4	LOS B	0.8	5.3	0.67	0.85	45.2
East: Ewingsdale Rd E											
4	L	77	0.0	0.408	5.2	LOS A	2.9	20.8	0.21	0.47	51.5
5	T	1053	3.0	0.408	4.0	LOS A	2.9	20.8	0.26	0.35	52.2
6	R	24	0.0	0.408	11.6	LOS B	2.2	15.8	0.32	0.83	47.0
Approach		1154	2.7	0.408	4.3	LOS A	2.9	20.8	0.26	0.37	52.0
North: Woodford Lane											
7	L	16	0.0	0.022	7.6	LOS A	0.1	0.7	0.59	0.62	48.6
8	T	1	0.0	0.022	6.5	LOS A	0.1	0.7	0.59	0.57	48.8
9	R	1	0.0	0.022	14.0	LOS B	0.1	0.7	0.59	0.81	45.3
Approach		18	0.0	0.022	7.8	LOS A	0.1	0.7	0.59	0.63	48.4
West: Ewingsdalel Rd W											
10	L	4	0.0	0.290	5.4	LOS A	1.9	13.6	0.29	0.49	51.1
11	T	704	3.0	0.290	4.2	LOS A	1.9	13.6	0.29	0.38	51.9
12	R	49	0.0	0.290	11.7	LOS B	1.4	10.2	0.29	0.84	46.9
Approach		757	2.8	0.290	4.6	LOS A	1.9	13.6	0.29	0.41	51.5
All Vehicles		2050	2.6	0.408	4.9	LOS A	2.9	20.8	0.30	0.41	51.3

MOVEMENT SUMMARY

Site: AM 2013 without development

Ewingsdale Road & McGettigans Lane
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: McGettigans Lane											
1	L	47	0.0	0.103	13.5	LOS B	0.2	1.6	0.48	0.92	44.6
3	R	122	0.0	0.229	18.0	LOS C	0.8	5.8	0.56	1.00	44.0
Approach		169	0.0	0.229	16.7	LOS C	0.8	5.8	0.54	0.98	44.2
East: Ewingsdale Road											
4	L	89	0.0	0.048	8.2	LOS A	0.0	0.0	0.00	0.67	49.0
5	T	435	3.0	0.227	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		524	2.5	0.227	1.4	NA	0.0	0.0	0.00	0.11	57.8
West: Ewingsdale Road											
11	T	750	3.0	0.392	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	79	0.0	0.094	10.7	LOS B	0.4	2.6	0.51	0.75	46.4
Approach		829	2.7	0.392	1.0	NA	0.4	2.6	0.05	0.07	58.4
South West: Median (RT Stage 2)											
32	R	122	0.0	0.119	3.3	LOS A	0.4	2.1	0.47	0.60	28.6
Approach		122	0.0	0.119	3.3	LOS A	0.4	2.1	0.47	0.60	28.6
All Vehicles		1644	2.2	0.392	2.9	NA	0.8	5.8	0.11	0.22	55.6

MOVEMENT SUMMARY

Site: PM 2013 without development

Ewingsdale Road & McGettigans Lane
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: McGettigans Lane											
1	L	52	0.0	0.149	17.1	LOS C	0.4	2.7	0.65	1.00	41.9
3	R	71	0.0	0.197	21.7	LOS C	0.7	4.6	0.70	1.01	40.6
Approach		123	0.0	0.197	19.7	LOS C	0.7	4.6	0.68	1.00	41.2
East: Ewingsdale Road											
4	L	75	0.0	0.040	8.2	LOS A	0.0	0.0	0.00	0.67	49.0
5	T	764	3.0	0.399	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		839	2.7	0.399	0.7	NA	0.0	0.0	0.00	0.06	58.8
West: Ewingsdale Road											
11	T	501	3.0	0.262	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	40	0.0	0.071	13.2	LOS B	0.3	1.8	0.63	0.86	44.0
Approach		541	2.8	0.262	1.0	NA	0.3	1.8	0.05	0.06	58.4
South West: Median (RT Stage 2)											
32	R	71	0.0	0.055	2.4	LOS A	0.2	1.0	0.36	0.44	29.6
Approach		71	0.0	0.055	2.4	LOS A	0.2	1.0	0.36	0.44	29.6
All Vehicles		1574	2.4	0.399	2.4	NA	0.7	4.6	0.09	0.15	56.4

MOVEMENT SUMMARY

Site: AM 2024 without development

Ewingsdale Road & McGettigans Lane
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: McGettigans Lane											
1	L	47	0.0	0.117	15.1	LOS C	0.3	2.0	0.55	0.97	43.4
3	R	122	0.0	0.287	20.8	LOS C	1.1	7.8	0.66	1.03	41.4
Approach		169	0.0	0.287	19.2	LOS C	1.1	7.8	0.63	1.02	42.0
East: Ewingsdale Road											
4	L	89	0.0	0.048	8.2	LOS A	0.0	0.0	0.00	0.67	49.0
5	T	602	3.0	0.315	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		691	2.6	0.315	1.1	NA	0.0	0.0	0.00	0.09	58.3
West: Ewingsdale Road											
11	T	1038	3.0	0.543	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	79	0.0	0.116	12.0	LOS B	0.4	3.1	0.58	0.83	45.1
Approach		1117	2.8	0.543	0.8	NA	0.4	3.1	0.04	0.06	58.6
South West: Median (RT Stage 2)											
32	R	122	0.0	0.171	5.0	LOS A	0.5	3.0	0.65	0.74	25.5
Approach		122	0.0	0.171	5.0	LOS A	0.5	3.0	0.65	0.74	25.5
All Vehicles		2099	2.3	0.543	2.6	NA	1.1	7.8	0.11	0.18	56.0

MOVEMENT SUMMARY

Site: PM 2024 without development

Ewingsdale Road & McGettigans Lane
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: McGettigans Lane											
1	L	52	0.0	0.188	21.2	LOS C	0.5	3.8	0.77	1.01	39.0
3	R	71	0.0	0.275	27.4	LOS D	1.0	6.7	0.80	1.03	36.3
Approach		123	0.0	0.275	24.8	LOS C	1.0	6.7	0.79	1.02	37.5
East: Ewingsdale Road											
4	L	75	0.0	0.040	8.2	LOS A	0.0	0.0	0.00	0.67	49.0
5	T	984	3.0	0.514	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1059	2.8	0.514	0.6	NA	0.0	0.0	0.00	0.05	59.1
West: Ewingsdale Road											
11	T	694	3.0	0.363	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	40	0.0	0.099	16.2	LOS C	0.3	2.4	0.74	0.91	41.5
Approach		734	2.8	0.363	0.9	NA	0.3	2.4	0.04	0.05	58.6
South West: Median (RT Stage 2)											
32	R	71	0.0	0.066	3.0	LOS A	0.2	1.2	0.44	0.53	28.9
Approach		71	0.0	0.066	3.0	LOS A	0.2	1.2	0.44	0.53	28.9
All Vehicles		1987	2.5	0.514	2.3	NA	1.0	6.7	0.08	0.13	56.6

MOVEMENT SUMMARY

Site: AM 2013 with development

Ewingsdale Road & McGettigans Lane
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: McGettigans Lane											
1	L	50	0.0	0.115	14.1	LOS B	0.3	1.9	0.51	0.94	44.2
3	R	130	0.0	0.265	19.1	LOS C	1.0	7.2	0.60	1.02	42.9
Approach		180	0.0	0.265	17.7	LOS C	1.0	7.2	0.58	1.00	43.3
East: Ewingsdale Road											
4	L	91	0.0	0.049	8.2	LOS A	0.0	0.0	0.00	0.67	49.0
5	T	497	3.0	0.260	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		588	2.5	0.260	1.3	NA	0.0	0.0	0.00	0.10	58.0
West: Ewingsdale Road											
11	T	802	3.0	0.419	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	80	0.0	0.103	11.1	LOS B	0.4	2.8	0.54	0.78	45.9
Approach		882	2.7	0.419	1.0	NA	0.4	2.8	0.05	0.07	58.4
South West: Median (RT Stage 2)											
32	R	130	0.0	0.135	3.6	LOS A	0.4	2.4	0.50	0.63	28.1
Approach		130	0.0	0.135	3.6	LOS A	0.4	2.4	0.50	0.63	28.1
All Vehicles		1780	2.2	0.419	3.0	NA	1.0	7.2	0.12	0.22	55.5

MOVEMENT SUMMARY

Site: PM 2013 with development

Ewingsdale Road & McGettigans Lane
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: McGettigans Lane											
1	L	54	0.0	0.164	18.0	LOS C	0.4	3.1	0.69	1.00	41.2
3	R	75	0.0	0.228	23.3	LOS C	0.8	5.5	0.73	1.02	39.4
Approach		129	0.0	0.228	21.1	LOS C	0.8	5.5	0.72	1.01	40.2
East: Ewingsdale Road											
4	L	81	0.0	0.044	8.2	LOS A	0.0	0.0	0.00	0.67	49.0
5	T	823	3.0	0.430	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		904	2.7	0.430	0.7	NA	0.0	0.0	0.00	0.06	58.8
West: Ewingsdale Road											
11	T	557	3.0	0.291	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	42	0.0	0.082	14.0	LOS B	0.3	2.0	0.66	0.88	43.3
Approach		599	2.8	0.291	1.0	NA	0.3	2.0	0.05	0.06	58.4
South West: Median (RT Stage 2)											
32	R	75	0.0	0.061	2.6	LOS A	0.2	1.1	0.38	0.47	29.4
Approach		75	0.0	0.061	2.6	LOS A	0.2	1.1	0.38	0.47	29.4
All Vehicles		1707	2.4	0.430	2.4	NA	0.8	5.5	0.09	0.15	56.3

MOVEMENT SUMMARY

Site: AM 2024 with development

Ewingsdale Road & McGettigans Lane
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: McGettigans Lane											
1	L	50	0.0	0.131	15.8	LOS C	0.3	2.3	0.59	1.00	42.8
3	R	130	0.0	0.334	22.4	LOS C	1.3	9.4	0.71	1.05	40.1
Approach		180	0.0	0.334	20.6	LOS C	1.3	9.4	0.68	1.04	40.9
East: Ewingsdale Road											
4	L	91	0.0	0.049	8.2	LOS A	0.0	0.0	0.00	0.67	49.0
5	T	664	3.0	0.347	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		755	2.6	0.347	1.0	NA	0.0	0.0	0.00	0.08	58.4
West: Ewingsdale Road											
11	T	1090	3.0	0.570	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	80	0.0	0.127	12.6	LOS B	0.5	3.3	0.60	0.86	44.5
Approach		1170	2.8	0.570	0.9	NA	0.5	3.3	0.04	0.06	58.6
South West: Median (RT Stage 2)											
32	R	130	0.0	0.197	5.6	LOS A	0.6	3.5	0.68	0.78	24.7
Approach		130	0.0	0.197	5.6	LOS A	0.6	3.5	0.68	0.78	24.7
All Vehicles		2235	2.4	0.570	2.8	NA	1.3	9.4	0.12	0.19	55.8

MOVEMENT SUMMARY

Site: PM 2024 with development

Ewingsdale Road & McGettigans Lane
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: McGettigans Lane											
1	L	54	0.0	0.189	22.7	LOS C	0.6	4.4	0.80	1.01	37.9
3	R	75	0.0	0.321	29.9	LOS D	1.1	7.9	0.83	1.04	34.6
Approach		129	0.0	0.321	26.9	LOS D	1.1	7.9	0.82	1.03	36.0
East: Ewingsdale Road											
4	L	81	0.0	0.044	8.2	LOS A	0.0	0.0	0.00	0.67	49.0
5	T	1043	3.0	0.545	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1124	2.8	0.545	0.6	NA	0.0	0.0	0.00	0.05	59.0
West: Ewingsdale Road											
11	T	750	3.0	0.392	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	42	0.0	0.115	17.3	LOS C	0.4	2.7	0.77	0.92	40.6
Approach		792	2.8	0.392	0.9	NA	0.4	2.7	0.04	0.05	58.5
South West: Median (RT Stage 2)											
32	R	75	0.0	0.073	3.3	LOS A	0.2	1.3	0.46	0.57	28.8
Approach		75	0.0	0.073	3.3	LOS A	0.2	1.3	0.46	0.57	28.8
All Vehicles		2120	2.5	0.545	2.4	NA	1.1	7.9	0.08	0.13	56.4