North Crestwood Traffic Study

Final Draft Report

draft

transportation planning, design and delivery

JS10760 04/11/11

GTAconsultants

North Crestwood Traffic Study

Final Draft Report

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1. Introduction

1.1 Background

Queanbeyan's population is expected to grow by 72% by 2036[1], making it one of NSW's fastest growing areas. This growth has the potential to have a considerable impact on traffic and transport in the Queanbeyan area. To address any impact of the likely growth of traffic on the road network, the *Googong and Tralee Traffic Study (2031)* was prepared to identify network improvements that would ensure Queanbeyan's transport network continues to operate at an acceptable level as its population grows.

As part of a broader transport strategy for Queanbeyan, North Crestwood (bounded by Uriarra Road, Henderson Road, Campbell Street and Crawford Street) is an area of interest due to its potential for increasing levels of development and the issues this raises for the operational traffic capacity of the area. Issues which have already been raised include overflow of visitor and private parking into the surrounding streets, sight distance issues at developments, difficult right turn movements to and from Uriarra Road and lack of pedestrian facilities along Uriarra Road.

Queanbeyan City Council commissioned GTA Consultants in April 2011 to undertake a traffic study of the North Crestwood area to address these issues and recommend potential improvements to the road network.

1.2 Purpose of this Report

The purpose of this report is to provide an assessment of the existing traffic conditions in the North Crestwood study area, detail the anticipated impacts of future development on the local road network and develop a concept and design plan for the study area to improve transport operation. To achieve these objectives, this report considers the following:

i An assessment of existing traffic conditions in the study area
ii Assessment of future development scenarios and development of road network improvement options
iii Development of a concept plan detailing recommended transport network improvements and cost estimates for the proposed treatments.

1.3 References

In preparing this report, reference has been made to the following:

- an inspection of the site and its surrounds
- *Googong and Tralee Traffic Study (2031)* – April 2010
- Quotation Q4/10 - North Crestwood Traffic Study – Amended Consultancy Brief (Revision No.1)
- Canberra and Queanbeyan Cycling and Walking Map
- Queanbeyan PAMP, May 2009

[1] Queanbeyan City Council Press Release dated 7 April 2010

- Queanbeyan Bicycle Plan, May 2010
- traffic and car parking surveys as referenced in the context of this report
- other documents and data as referenced in this report.

1.4 Googong and Tralee Traffic Study (2031)

In 2008, Queanbeyan Council commissioned Gabites Porter to create a transportation model of the Queanbeyan LGA based on the 2006 Census land use and traffic flows. The purpose of this study was to analyse the existing conditions of Queanbeyan's road network as well as analyse, test and optimise a number of 2031 future land use and infrastructure scenarios. The model included the road network of both the Canberra and Queanbeyan Local Government Areas (LGAs) to gain a comprehensive understanding of the operation of the road network across the region.

The study identified a number of network deficiencies in the existing Queanbeyan transport network, with most serious deficiencies occurring in Canberra rather than in the Queanbeyan LGA. The study identified lower public transport patronage in Queanbeyan compared to Canberra, in part due to poor service frequency and hours of operation of local bus services.

To determine network deficiencies in 2031, the study used predicted infill and greenfield development numbers, which included an 85% increase in the number of households in Queanbeyan and 110% increase in vehicle ownership. The modelling showed there would be a significant degradation in the level of service of a number of key intersections and roads throughout the Queanbeyan LGA under an 'all development' scenario to 2031. However in regards to the study area, the model identified the following locations that would be near capacity under this scenario:

- The Norse Road / Uriarra Road railway bridge and adjacent intersection with Kendall Avenue and Richard Avenue in both AM and PM peak periods (located just outside the study area to the west).
- The intersection of Uriarra Road / Ross Road in the PM peak period.
- The intersection of Crawford Street / Campbell Street / Erin Street in the PM peak period (located just outside the study area to the east).

A number of road and intersection improvements were recommended throughout Queanbeyan, however none in the vicinity of the study area.

2. Existing Conditions

The North Crestwood study area is located to the northwest of the Queanbeyan town centre. It is bounded by the following roads:

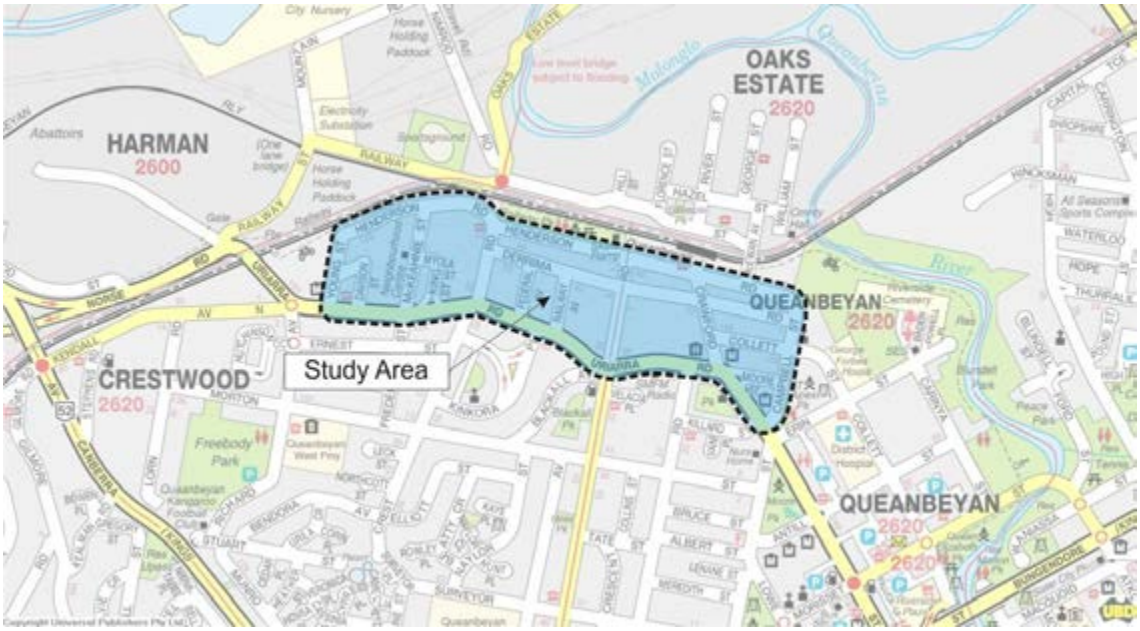
- Uriarra Road to the south
- Young Street to the west
- Henderson Road to the north
- Campbell Street to the east.

The area contains mainly residential land use with some commercial/retail land use located along Uriarra Road. The residential areas are divided into two main precincts to the west and east of Ross Road:

- East of Ross Road, the study area contains mainly single residential dwellings with a maximum height restriction of two storeys.
- West of Ross Road, the study area contains a large number of medium density residential flat buildings, with a maximum height restriction of four storeys.

The location of the study area and its surrounds are shown in Figure 2.1.

Figure 2.1: Study Area and its Surrounds



(Base map reproduced with permission from Universal Publishers Pty Ltd)

2.1 Site Observations

The following traffic-related observations were noted during a site visit conducted on Thursday 5th May 2011:

- A moderate level of on-street parking was observed during the early morning before 7am representing overnight resident parking.
- On-street parking was not observed to interfere with access to garbage collection.

- Garbage bins were not observed to interfere with property access or restrict through traffic to one lane at any point.
- Existing no stopping zones appeared to be well placed around blind corners, steep hills and as an offset for intersections or on narrow roads or laneways.

The following intersections were noted to have poor visibility for oncoming traffic:

- Collett Street/Campbell Street – to the north
- Derria Road/Henderson Road – to the north
- Ross Road/Uriarra Road - to the east
- Crawford Street/Uriarra Road – to the east
- Crest Road/ Uriarra Road – to the east.

Poor visibility was generally either caused by steep grades or sharp curves in the roadway.

Overall, the existing queues and delays at intersections appeared to be acceptable.

2.2 Road Network

All roads within the study area are under the care, control and management of the Queanbeyan City Council. The three major roads within the study area are described in the following sections.

2.2.1 Major Roads

Uriarra Road / Crawford Street

Uriarra Road / Crawford Street is classified as an Arterial Road[2] and is generally aligned in an east-west direction. Crawford Street turns into Uriarra Road near the eastern end of the study area where and for the majority of its length is a divided road with one lane in each direction. The posted speed limit is 60km/h.

Unrestricted kerbside parking in a dedicated parking lane is generally permitted on both sides of Uriarra Road, with the exception of a section on the north side of the Road between Young Street and McKeahnie Street, which has 1-hour parking restrictions at all times.

Uriarra Road is shown in Figure 2.2 and Figure 2.3 and carries approximately 13,400 vehicles per day[3].

2 Figure 5, Queanbeyan PAMP dated May 2009

3 Based on peak hour traffic counts commissioned by GTA Consultants between Blackall Avenue and Ross Road on 5 May 2011 and assuming a peak-to-daily ratio of 10%.

Figure 2.2: Uriarra Road at Frederick Street Looking West

Figure 2.3: Uriarra Road at Ross Road Looking East

Henderson Road

Henderson Road is classified as a Collector Road[4] and is generally aligned in an east-west direction. It is a two-way road configured with one lane in each direction. The posted speed limit is 50 km/h.

Henderson Road is shown in Figure 2.4 and Figure 2.5 and carries approximately 3,200 vehicles per day[5].

Figure 2.4: Henderson Road Looking West

Figure 2.5: Henderson Road Looking East

Ross Road

North of Uriarra Road, Ross Road is classified as a Distributor Road[4] and is aligned in a north-south direction. It is a two-way road configured with one lane in each direction. The posted speed limit is 50 km/h.

Ross Road is shown in Figure 2.6 and Figure 2.7 and carries approximately 2,200 vehicles per day[6].

4 Figure 5, Queanbeyan PAMP dated May 2009

5 Based on peak hour traffic counts commissioned by GTA Consultants immediately west of McEwan Avenue on 5 May 2011 and assuming a peak-to-daily ratio of 10%.

6 Based on peak hour traffic counts commissioned by GTA Consultants immediately south of Uriarra Road on 5 May 2011 and assuming a peak-to-daily ratio of 10%.

Figure 2.6: Ross Road Looking North

Figure 2.7: Ross Road Looking South

2.2.2 Other Roads

Other roads in the in the vicinity of the study area include:

- Canberra Avenue – connects Queanbeyan to Canberra to the west of the study area
- Norse Road – connects Canberra Avenue to Uriarra Road over the railway line
- Kendall Avenue North – connects Canberra Avenue to Uriarra Road.

2.2.3 Surrounding Intersections

The following major intersections are located in or adjacent to the study area:

- Uriarra Road / Kendall Avenue North / Richard Avenue – 4-way roundabout located just to the west of the study area
- Uriarra Road / Ross Avenue – 4-way give way intersection
- Uriarra Road / Crawford Street – give way T-intersection.

2.3 Traffic Volumes

GTA Consultants commissioned traffic movement counts at the intersections of:

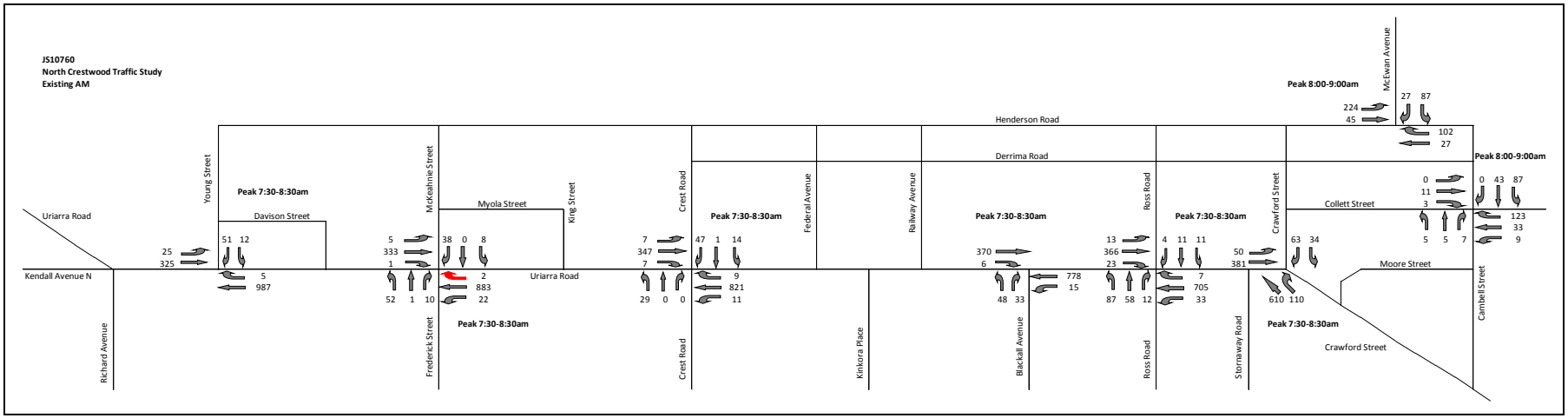
- Uriarra Road / Young Street
- Uriarra Road / McKeahnie Street / Frederick Street
- Uriarra Road / Blackall Avenue
- Uriarra Road / Crest Road
- Uriarra Road / Ross Road
- Uriarra Road / Crawford Street
- Campbell Street / Collett Street
- Henderson Road / McEwan Street.

These counts were undertaken on Thursday 5th May 2011 during the following peak periods:

- Morning (AM) peak – between 7:00am and 9:00am
- Evening (PM) peak – between 4:00pm and 6:00pm.

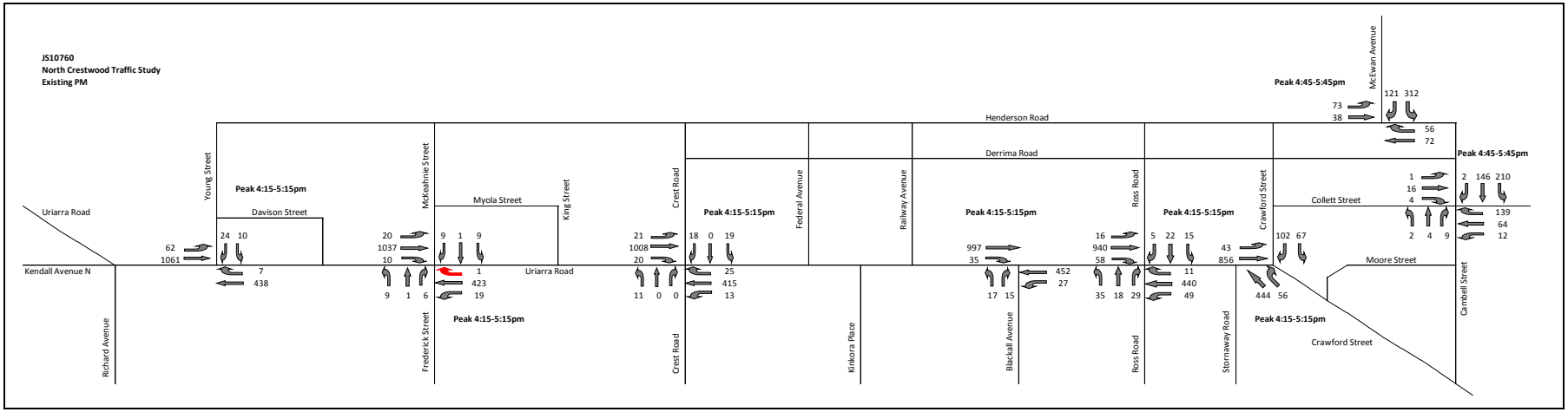
The Thursday AM and PM peak hour traffic volumes are summarised in Figure 2.8 and Figure 2.9 with full results contained in Appendix B.

Figure 2.8: Existing Thursday AM Peak Hour Traffic Volumes



Illegal Movement

Figure 2.9: Existing Thursday PM Peak Hour Traffic Volumes



Illegal Movement

Figure 2.8 and Figure 2.9 illustrate that the major movement along Uriarra Road is westbound during the Thursday AM peak hour and eastbound during the Thursday PM peak hour. The eastbound volumes on Uriarra Road are highest during the PM peak period suggesting that any right turning and through movements for the side roads would be most impacted during this time period.

2.4 Intersection Operation

The operation of the eight surveyed intersections within the study area has been assessed using SIDRA INTERSECTION[7], a computer based modelling package which calculates intersection performance.

The commonly used measure of intersection performance, as defined by the RTA, is vehicle delay. SIDRA INTERSECTION determines the average delay that vehicles encounter and provides a measure of the level of service.

Table 2.1 shows the criteria that SIDRA INTERSECTION adopts in assessing the level of service.

Table 2.1: SIDRA INTERSECTION Level of Service Criteria

Level of Service (LOS)	Average Delay per vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Sign
A	0 to 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	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

Table 2.2 to Table 2.9 present a summary of the existing operations of the eight intersections surveyed during the Thursday AM and PM peak periods. Full results are presented in Appendix C.

Table 2.2: Uriarra Road / Young Street Intersection - Existing Operating Conditions

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Uriarra Road E	0.56	6	101	A
	Young Street (Lane 1 - Left)	0.04	10	1	A
	Young Street (Lane 2 - Right)	0.58	58	16	E
	Uriarra Road W	0.21	1	0	A
	Overall	0.58	6	101	
Thu PM	Uriarra Road E	0.27	24	68	B
	Young Street (Lane 1 - Left)	0.08	27	2	B
	Young Street (Lane 2 - Right)	0.37	65	9	E
	Uriarra Road W	0.60	0	0	A
	Overall	0.60	8	68	

Table 2.2 indicates that the Uriarra Road / Young Street intersection currently operates at an acceptable level of service, with the exception of the following movement:

[7] Program used under license from Akcelik & Associates Pty Ltd.

- Right turn out of Young Street which operates at a level of service E during both the AM and PM peak hours.

Vehicles turning right from Young Street into Uriarra Road experience average delays of 60 seconds during the AM and PM peak hour. The 95th percentile queue length is 3 vehicles which corresponds with the on-site observations.

Table 2.3: Uriarra Road / Frederick Street / McKeahnie Street Intersection - Existing Operating Conditions

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Frederick Street (Lane 1 - Left)	0.22	21	6	B
	Frederick Street (Lane 2 – Through / Right)	0.19	55	4	D
	Uriarra Road E	0.51	5	81	A
	McKeahnie Street (Lane 1 - Left)	0.02	9	0	A
	McKeahnie Street (Lane 2 - Through / Right)	0.58	86	18	F
	Uriarra Road W	0.20	12	37	A
	Overall	0.58	10	81	
Thu PM	Frederick Street (Lane 1 - Left)	0.01	10	0	A
	Frederick Street (Lane 2 – Through / Right)	0.15	78	4	F
	Uriarra Road E	0.24	19	58	B
	McKeahnie Street (Lane 1 - Left)	0.06	24	1	B
	McKeahnie Street (Lane 2 - Through / Right)	0.21	83	5	F
	Uriarra Road W	0.57	7	113	A
	Overall	0.57	11	113	

Table 2.3 indicates that the Uriarra Road / Frederick Street / McKeahnie Street intersection currently operates overall at an acceptable level of service with the exception of the following movements:

- Vehicles turning right out of Frederick Street into Uriarra Road, or continuing through the intersection experience average delays of approximately 60 seconds during AM peak hour and 80 seconds during the PM peak hour. The level of service for this movement is D in the AM peak hour and F in the PM peak hour.
- Vehicles turning right out of McKeahnie Street into Uriarra Road, or continuing through the intersection experience average delays of approximately 80 seconds during both the AM and PM peak periods. The level of service for this movement is F in both peak periods. The 95th percentile queue was 3 vehicles during the AM peak hour and 1 vehicle during the PM peak hour.

Table 2.4: Uriarra Road / Crest Road Intersection - Existing Operating Conditions

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Crest Road S	0.10	17	3	B
	Uriarra Road E (Lane 1 - Through)	0.46	0	0	A
	Uriarra Road E (Lane 2 - Right)	0.1	9	0	A
	Crest Road N (Lane 1 - Left)	0.02	9	1	A
	Crest Road N (Lane 2 – Right / Through)	0.59	74	19	F
	Uriarra Road W (Lane 1 – Left/Through)	0.20	0	0	A
	Uriarra Road W (Lane 2 - Right)	0.02	15	1	B
	Overall	0.59	4	20	
Thu PM	Crest Road S	0.02	10	1	A
	Uriarra Road E (Lane 1 - Through)	0.23	0	0	A
	Uriarra Road E (Lane 2 - Right)	0.10	20	3	B
	Crest Road N (Lane 1 - Left)	0.10	24	3	B
	Crest Road N (Lane 2 – Right / Through)	0.41	105	11	F
	Uriarra Road W (Lane 1 – Left/Through)	0.56	0	0	A
	Uriarra Road W (Lane 2 - Right)	0.02	10	1	A
	Overall	0.56	2.3	11	

Table 2.4 indicates that the Uriarra Road / Crest Road intersection currently operates overall with an acceptable level of service with the exception of:

- Vehicles turning right from the north approach of Crest Road into Uriarra Road.

Vehicles currently experience average delays of over 60 seconds during both the AM and PM peak hours. The level of service for this movement is F during both peak hours.

Table 2.5: Uriarra Road / Blackall Avenue Intersection - Existing Operating Conditions

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Blackall Avenue (Lane 1 - Left)	0.15	16	4	B
	Blackall Avenue (Lane 2 – Right)	0.36	53	11	D
	Uriarra Road E	0.44	0	0	A
	Uriarra Road W (Lane 1 - Through)	0.20	0	0	A
	Uriarra Road W (Lane 2 - Right)	0.03	11	3	A
	Overall	0.44	2	11	
Thu PM	Blackall Avenue (Lane 1 - Left)	0.03	10	1	A
	Blackall Avenue (Lane 2 – Right)	0.31	91	8	F
	Uriarra Road E	0.26	0	0	A
	Uriarra Road W (Lane 1 - Through)	0.50	0	0	A
	Uriarra Road W (Lane 2 - Right)	0.07	6	4	A
	Overall		2	8	

Table 2.5 shows that the Uriarra Road / Blackall Avenue intersection currently operates overall at an acceptable level of service with the exception of the following movement:

- Vehicles turning right from Blackall Avenue into Uriarra Road.

Currently, vehicles experience average delays of approximately 50 seconds during the AM peak hour and 90 seconds during the PM peak hour. The level of service for this movement is F during both peak hours.

Table 2.6: Uriarra Road / Ross Road Intersection - Existing Operating Conditions

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Ross Road S (Lane 1 - Left)	0.23	18	7	B
	Ross Road S (Lane 2 – Through / Right)	0.59	58	22	E
	Uriarra Road E (Lane 1 – Left / Through)	0.42	0	0	A
	Uriarra Road E (Lane 2 - Right)	0.01	9	0	A
	Ross Road N (Lane 1 - Left)	0.04	13	1	A
	Ross Road N (Lane 2 – Through / Right)	0.16	46	5	D
	Uriarra Road W (Lane 1 – Left / Through)	0.22	0	0	A
	Uriarra Road W (Lane 2 - Right)	0.05	13	1	A
	Overall	0.59	5	22	
Thu PM	Ross Road S (Lane 1 - Left)	0.06	13	2	A
	Ross Road S (Lane 2 – Through / Right)	0.87	97	21	F
	Uriarra Road E (Lane 1 – Left / Through)	0.26	1	0	A
	Uriarra Road E (Lane 2 - Right)	0.03	17	1	B
	Ross Road N (Lane 1 - Left)	0.09	24	2	B
	Ross Road N (Lane 2 – Through / Right)	0.44	61	9	E
	Uriarra Road W (Lane 1 – Left / Through)	0.51	0	0	A
	Uriarra Road W (Lane 2 - Right)	0.07	10	2	A
	Overall		5	21	

Table 2.6 shows that the Uriarra Road / Ross Road intersection currently operates overall at an acceptable level of service with the exception of the following movements:

- Vehicles turning right from the south leg of Ross Road into Uriarra Road or continuing through the intersection, currently experience average delays of approximately 60 seconds during the AM peak hour and 100 seconds during the PM peak hour. The level of service for this movement is E during the AM peak hour and F during the PM peak hour. In the PM peak hour the degree of saturation is 0.87 which is also approaching the ideal limit of 0.90 for an unsignalised intersection.

Vehicles turning right from the north leg of Ross Road into Uriarra Road or continuing through the intersection currently experience average delays of approximately 45 seconds during the AM and 60 seconds during the PM. The level of service for this movement is D during the AM peak hour and E during the PM peak hour.

Table 2.7: Uriarra Road / Crawford Street Intersection - Existing Operating Conditions

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Crawford Street E (Lane 1 - Through)	0.34	0	0	A
	Crawford Street E (Lane 2 - Right)	0.13	10	5	A
	Crawford Street N (Lane 1 - Left)	0.05	10	2	A
	Crawford Street N (Lane 2 - Right)	0.41	34	13	C
	Uriarra Road W	0.25	1	0	A
	Overall	0.41	3	13	
Thu PM	Crawford Street E (Lane 1 - Through)	0.24	0	0	A
	Crawford Street E (Lane 2 - Right)	0.14	16	4	B
	Crawford Street N (Lane 1 - Left)	0.22	18	7	B
	Crawford Street N (Lane 2 - Right)	0.74	52	26	D
	Uriarra Road W	0.47	0	0	A
	Overall	0.74	5	26	

Table 2.7 shows that the Uriarra Road / Crawford Street intersection currently operates overall at an acceptable level of service with the exception of the following movement:

- Vehicles turning right from the northern approach of Crawford Street into Uriarra Road.

Currently, vehicles experience an average delay of approximately 30 seconds during the AM and 60 seconds during the PM. The level of service for this movement is D during the AM peak hour and F during the PM peak hour.

Table 2.8: Campbell Street / Collett Street Intersection - Existing Operating Conditions

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Campbell Street S	0.01	5	1	A
	Collett Street E	0.22	8	9	A
	Campbell Street N	0.08	4	4	A
	Collett Street W	0.02	7	1	A
	Overall	0.22	6	9	
Thu PM	Campbell Street S	0.01	7	1	A
	Collett Street E	0.38	11	19	A
	Campbell Street N	0.21	4	11	A
	Collett Street W	0.04	9	1	A
	Overall	0.38	7	19	

Table 2.8 shows that the Campbell Street / Collett Street intersection currently operates satisfactorily overall with minimal queues and delays on all approaches.

Table 2.9: Henderson Road / McEwan Avenue Intersection - Existing Operating Conditions

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Henderson Road E	0.12	7	5	A
	McEwan Avenue N	0.15	8	5	A
	Henderson Road W	0.16	5	0	A
	Overall	0.16	6	5	
Thu PM	Henderson Road E	0.09	3	4	A
	McEwan Avenue N	0.52	9	32	A
	Henderson Road W	0.07	4	0	A
	Overall	0.52	7	32	

Table 2.9 shows that the Henderson Road / McEwan Avenue intersection currently operates satisfactorily overall with minimal queues and delays on all approaches.

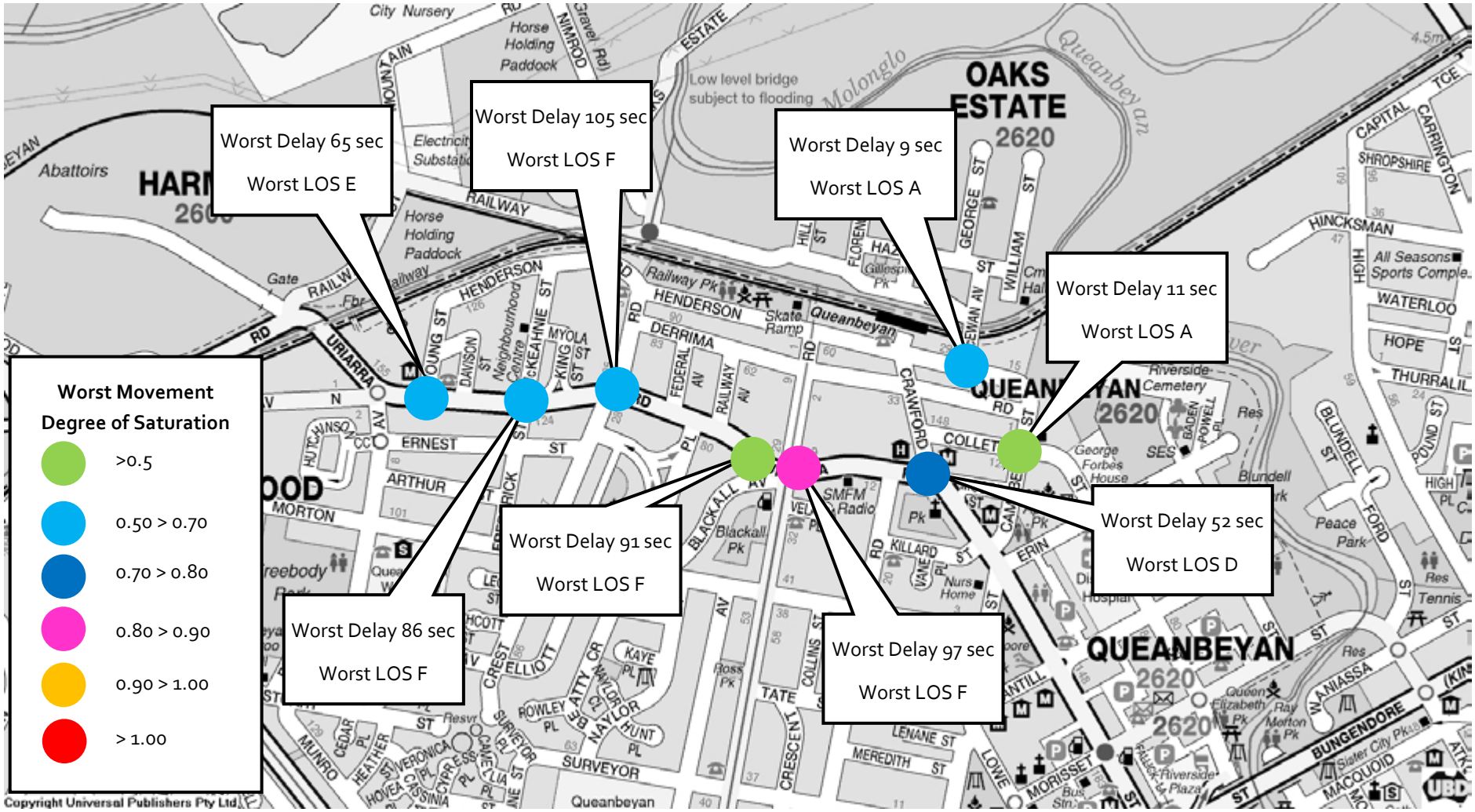
2.5 Summary of Existing Intersection Performance

Based on the results summarised in Section 2.4, the following intersections currently experience delays that are unsatisfactory:

- Uriarra Road / Young Street
- Uriarra Road / McKeahnie Street
- Uriarra Road / Crest Road
- Uriarra Road / Blackall Avenue

It is noted however that this relates to average delay per vehicle and not intersection degree of saturation or queuing. A summary of the intersection performance within the study area is indicated graphically in Figure 2.10.

Figure 2.10: Summary of Existing Intersection Performance



2.6 Car Parking

2.6.1 Supply

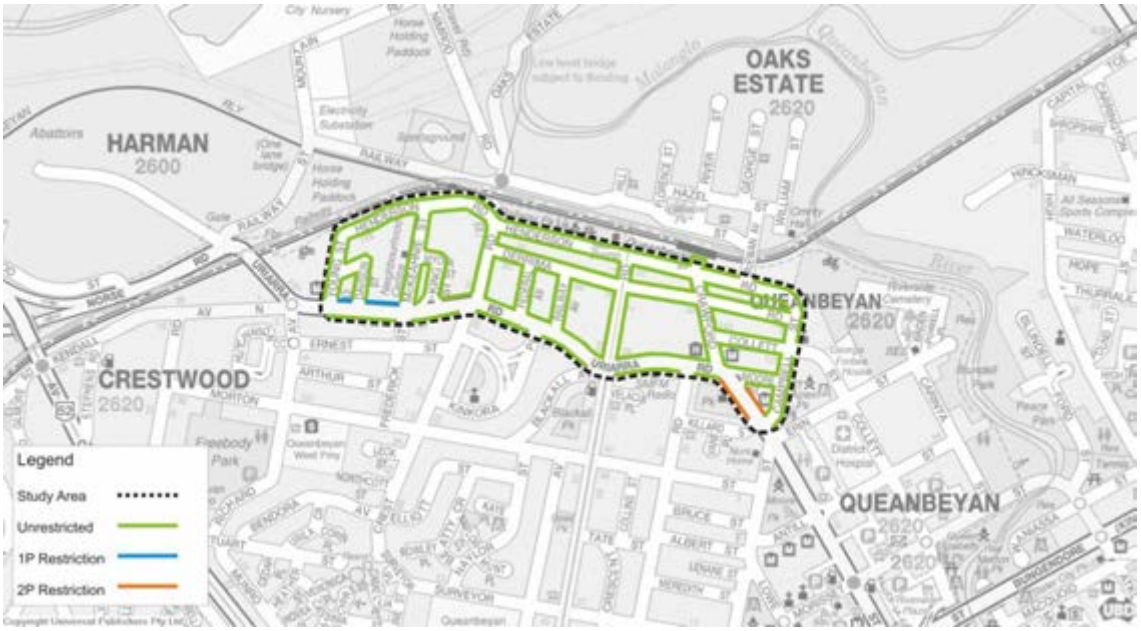
GTA Consultants compiled an inventory of publicly available on-street parking spaces within the study area. The inventory identified a total of 1062 on-street parking spaces. Of these spaces:

- 1,007 were unrestricted
- 24 were restricted to one hour (1P) – at all times
- 31 were restricted to two hours (2P) – 8:30am-6pm Mon-Fri, 8:30am-12:30pm Sat.

The 1P restricted spaces were located on the north side of Uriarra Road between Young Street and McKeahnie Street. The 2P restricted spaces were located on both sides of Crawford Street between Moore Street and Campbell Street.

A map of the survey area and parking restrictions is shown in Figure 2.11 with the full inventory presented in Appendix D.

Figure 2.11: On-street Parking Survey Area



2.6.2 Demand

Parking demand surveys were undertaken by GTA Consultants within the study area on Thursday 5th May and Saturday 7th May 2011 during the following time periods:

- Thursday 5th May 2011 – between 7:00am and 7:00pm
- Saturday 7th May 2011 – between 8:00am and 6:00pm.

On-street parking demand was recorded every second hour on both survey days.

Figure 2.12 to Figure 2.15 show the parking demand and occupancy rate for on-street parking in the study area for all spaces, the unrestricted spaces and the 1P and 2P restricted spaces.

Figure 2.12: Parking Demand and Occupancy Rate – Total Spaces

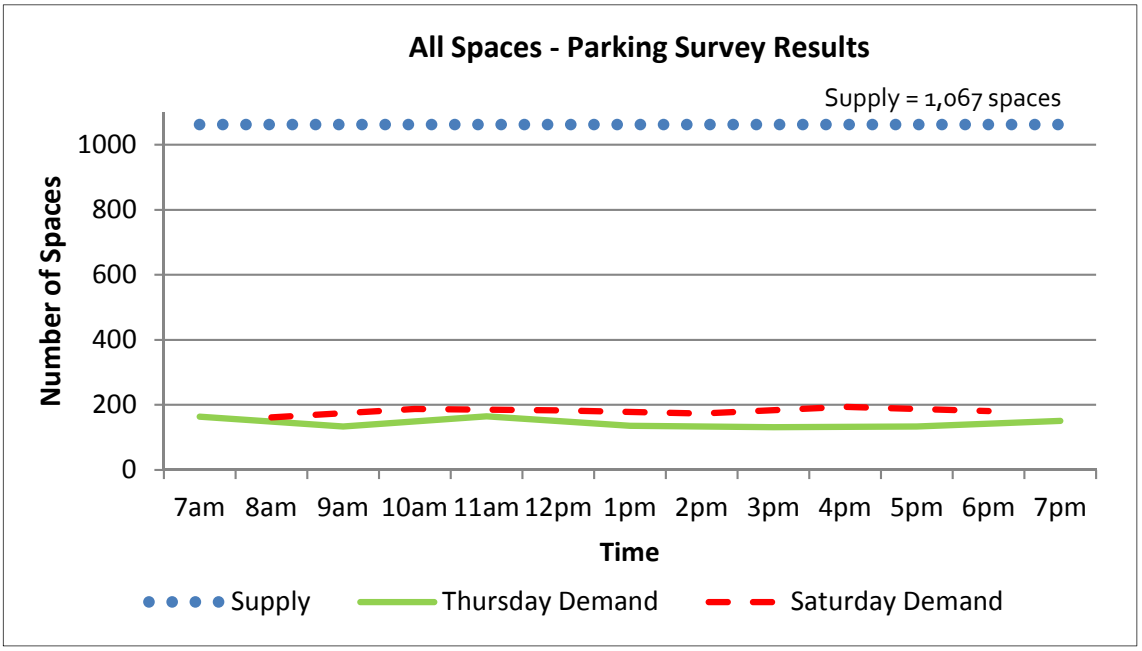


Figure 2.12 shows the parking demand and occupancy rate for all 1,067 spaces in the study area. Demand for all spaces is low, with peak demand occurring at:

- 11:00am on Thursday - 165 spaces occupied (16%)
- 4:00pm on Saturday - 194 spaces occupied (18%).

Parking demand results for the Thursday peak time (11:00am) are summarised in Table 2.10.

Table 2.10: Thursday Peak Parking Demand and Occupancy – Peak Weekday 11:00am

Location of parking	Restrictions	Supply (Available Spaces)	Demand	Occupancy
Uriarra Road	Unrestricted	86	15	17%
	1P Restricted	24	0	0%
	Sub-Total	**110**	**15**	**14%**
Crawford Street	Unrestricted	35	18	51%
	2P Restricted	31	15	48%
	Sub-Total	**66**	**33**	**50%**
Henderson Road	Unrestricted	281	15	5%
Ross Road	Unrestricted	65	4	6%
Campbell Street	Unrestricted	41	7	17%
Young Street	Unrestricted	20	8	40%
Davison Street	Unrestricted	28	7	25%
McKeahnie Street	Unrestricted	63	7	11%
Myola Street	Unrestricted	8	3	38%
King Street	Unrestricted	30	7	23%
Crest Road	Unrestricted	46	14	30%
Federal Avenue	Unrestricted	34	11	32%
Railway Avenue	Unrestricted	38	4	11%
Derrima Road	Unrestricted	190	24	13%
Collett Street	Unrestricted	15	0	0%
Moore Street	Unrestricted	27	6	22%
Total		**1062**	**165**	**16%**

Table 2.10 indicates that overall demand for parking in the study area during the Thursday peak period was low, with 165 of the 1062 spaces (16%) occupied. The highest demand for parking was in Crawford Street, where 33 of the 66 spaces were occupied (50%) at the peak time for the study area. There was also moderate demand for parking in Young Street, where 8 of the 20 spaces (40%) were occupied at the peak time for the study area.

These results indicate that overall the supply of on-street parking in the study area caters for the existing Thursday peak parking demand.

Parking Demand results for the Saturday peak time (4:00pm) are summarised in Table 2.11.

Table 2.11: Saturday Peak Parking Demand and Occupancy – Peak Saturday 4:00pm

Location of parking	Restrictions	Supply (Available Spaces)	Demand	Occupancy
Uriarra Road	Unrestricted	86	17	20%
	1P Restricted	24	1	4%
	Sub-Total	**110**	**18**	**16%**
Crawford Street	Unrestricted	35	26	74%
	2P Restricted	31	5	16%
	Sub-Total	**66**	**31**	**47%**
Henderson Road	Unrestricted	281	16	6%
Ross Road	Unrestricted	65	5	8%
Campbell Street	Unrestricted	41	4	10%
Young Street	Unrestricted	20	4	20%
Davison Street	Unrestricted	28	15	54%
McKeahnie Street	Unrestricted	63	14	22%
Myola Street	Unrestricted	8	2	25%
King Street	Unrestricted	30	7	23%
Crest Road	Unrestricted	46	26	57%
Federal Avenue	Unrestricted	34	7	21%
Railway Avenue	Unrestricted	38	5	13%
Derrima Road	Unrestricted	190	30	16%
Collett Street	Unrestricted	15	9	60%
Moore Street	Unrestricted	27	1	4%
Total		**1062**	**194**	**18%**

Table 2.11 indicates that overall demand for parking in the study area during the Saturday peak period was also low, with 194 of the 1062 spaces (18%) occupied during the Saturday peak period. The highest demand for parking was in Crawford Street, where 26 of the 35 unrestricted spaces (74%) were occupied and 31 of the total 66 spaces were occupied (47%). There was also moderate demand for parking in Collett Street, where 9 of the 15 spaces (60%) were occupied at the peak time for the study area.

These results indicate that whilst demand is slightly higher than the Thursday peak period, the supply of on-street parking within the study area can cater for the existing Saturday peak parking demand.

Figure 2.13: Parking Demand and Occupancy Rate – Unrestricted Spaces

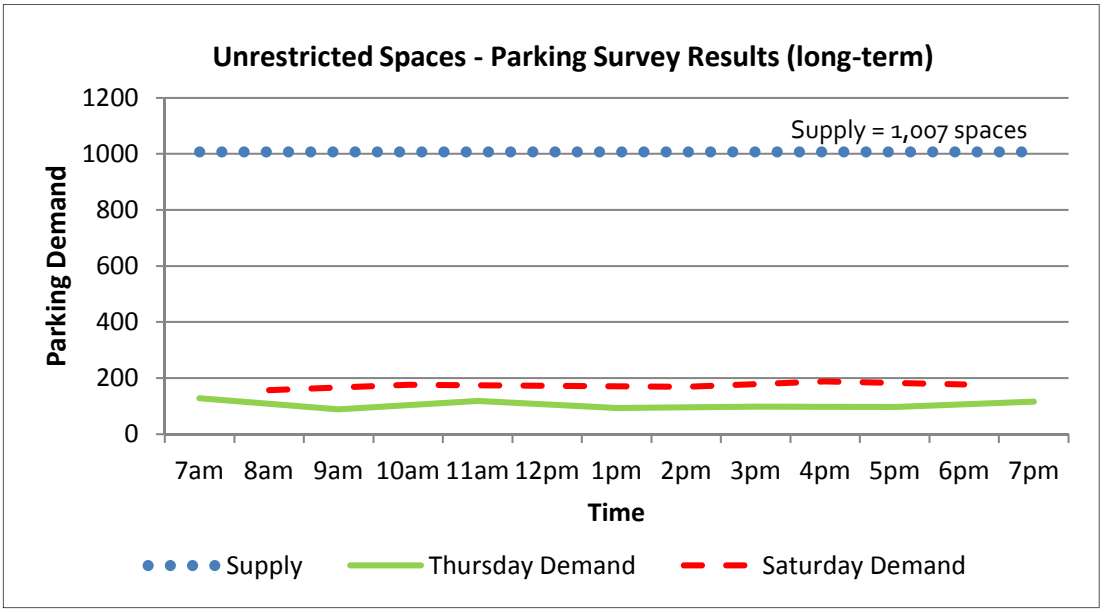


Figure 2.13 shows the parking demand and occupancy rate for the 1,007 unrestricted parking spaces in the study area. Demand for these spaces is low, with peak demand occurring at:

- 7:00am on Thursday - 159 spaces occupied (16%)
- 4:00pm on Saturday - 188 spaces occupied (19%).

Figure 2.14: Parking Demand and Occupancy Rate – 1P Restricted Spaces

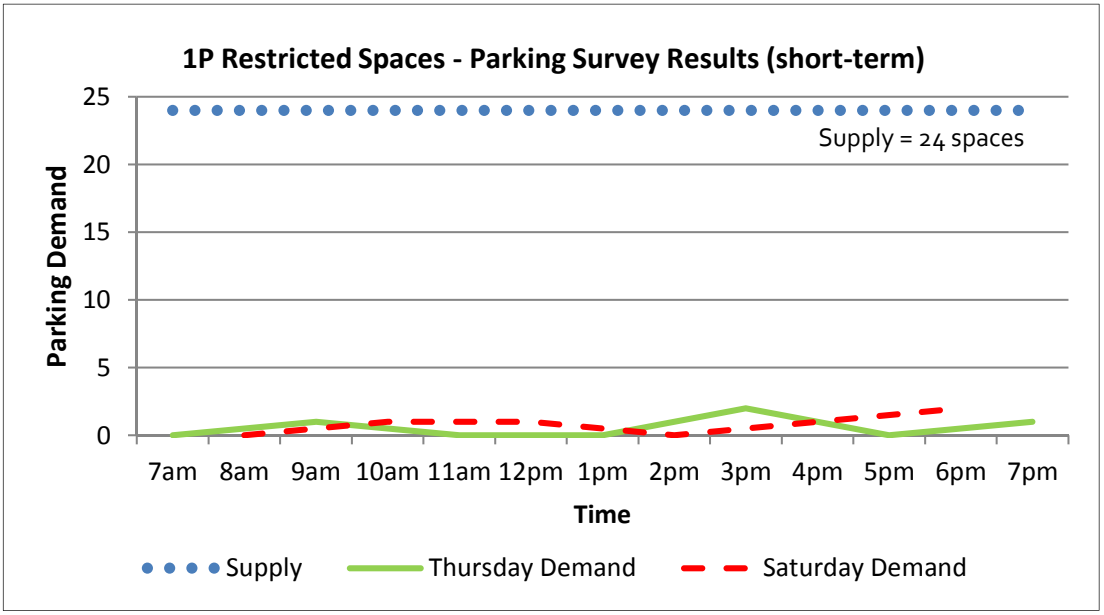


Figure 2.14 shows the parking demand and occupancy rate for the 24 x 1-hour (1P) restricted parking spaces in the study area. Demand is low, with peak demand occurring at:

- 2:00pm on Thursday – 2 spaces occupied (8%)
- 6:00pm on Saturday – 2 spaces occupied (8%).

Figure 2.15: Parking Demand and Occupancy Rate – 2P Restricted Spaces

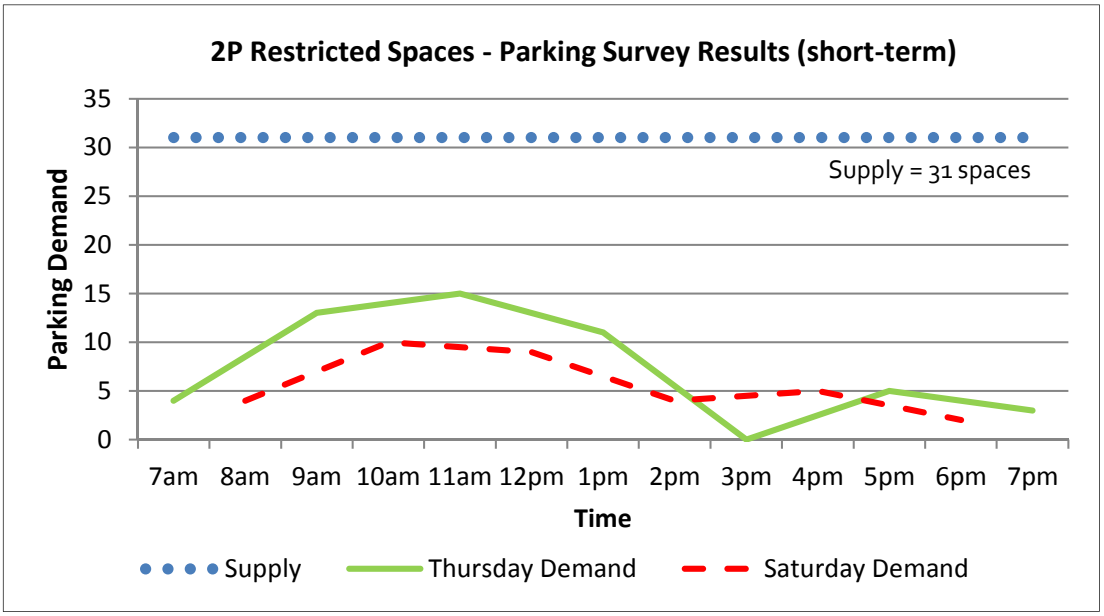


Figure 2.15 shows the parking demand and occupancy rate for the 31 two hour (2P) restricted parking spaces in the study area. Demand for these spaces is higher and more variable, with peak demand occurring at:

- 11:00am on Thursday – 15 spaces occupied (48%)
- 10:00am on Saturday – 10 spaces occupied (32%).

Full results of the parking demand survey and graphs for each road in the study area are provided in Appendix D.

2.7 Pedestrian Infrastructure

Marked pedestrian paths are located along the following roads:

- Uriarra Road (both sides)
- Young Street (eastern side)
- Henderson Road (southern side, shared path on northern side)
- Campbell Street (sections of both sides)
- Crawford Street (western side)
- Derrima Road (southern side)
- Collett Street (southern side)
- Moore Street (northern side)
- Ross Road (western side)
- Railway Avenue (western side)
- Federal Avenue (eastern side)
- Crest Road (eastern side).

There are no signalised intersections located within the study area and currently there is only one formal pedestrian crossing (zebra crossing), located along Uriarra Road between McKeahnie and King Street.

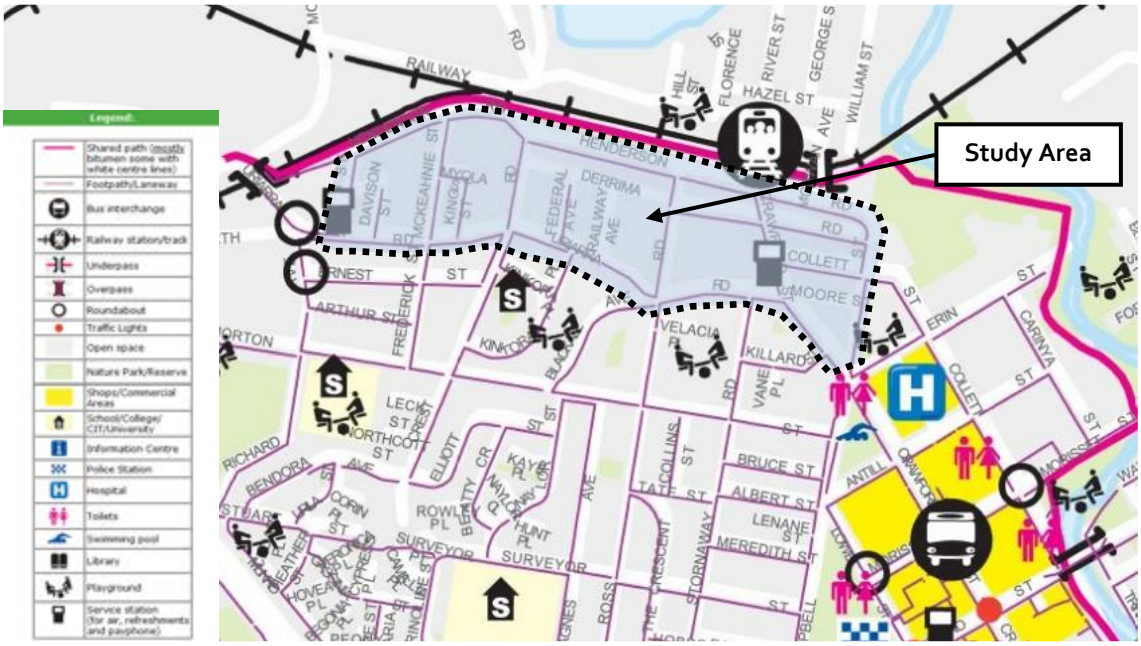
2.8 Existing and Proposed Bicycle Facilities

2.8.1 Canberra and Queanbeyan Cycling Map

The wider area contains a number of on and off-road cycleways. A shared off-road path runs alongside the railway line and Henderson Road in the northern part of the study area, connecting Queanbeyan's city centre to the east with Canberra to the west.

Figure 2.16 shows the location of the cycle routes in the study area and its surrounds.

Figure 2.16: Cycleways in the Study Area



(Source: tams.act.gov.au/move/cycling/cycling_and_walking_map)

Figure 2.17 and Figure 2.18 show the shared pedestrian/cycle path which runs alongside the railway line and Henderson Road.

Figure 2.17: Henderson Road Shared Pedestrian/Cycle Path Looking West

Figure 2.18: Henderson Road Shared Pedestrian/Cycle Path Looking East

2.8.2 Queanbeyan City Council Bicycle Plan

The Queanbeyan City Council Bicycle Plan was adopted by Council in April 2010 and sets out the existing and proposed new cycleways within the Council area. The plan prioritises all new cycleways into low, medium and high priority routes.

The Bicycle Plan aims to consider recreational cycling, connection between major uses within the Council area and connect to bicycle routes to those within the ACT.

An excerpt of the bicycle plan within the study area in shown in Figure 2.19.

Figure 2.19: Queanbeyan City Council Bicycle Plan (excerpt)

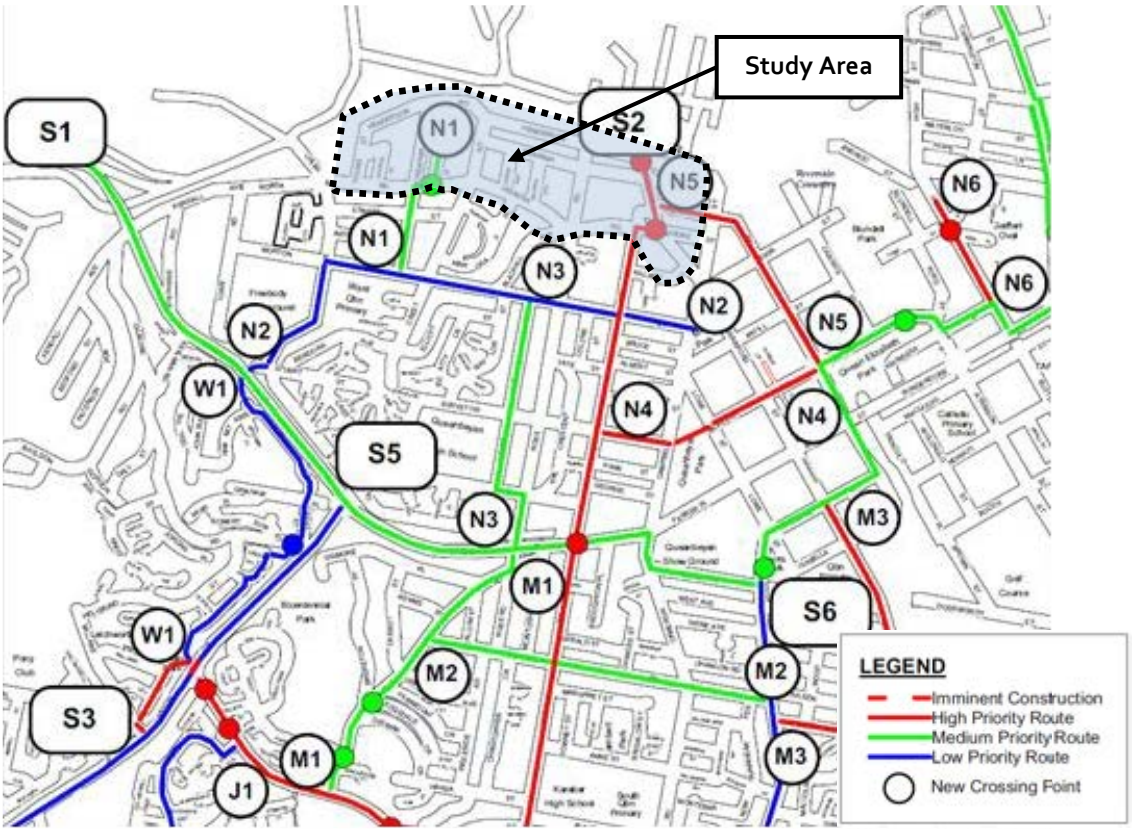


Figure 2.19 indicates the following bicycle routes are proposed within the study area:

- Route S2 – High Priority Route – Railway Station to Jerrabomberra
- Route N5 – High Priority Route - Collett Street
- Route N1 – Medium Priority Route – Frederick Street, Uriarra Road and King Street.

2.9 Queanbeyan Pedestrian and Mobility Plan

The Queanbeyan City Council Pedestrian and Mobility Plan sets out existing and proposed pedestrian routes within the Council area. The plan prioritises the pedestrian route identified across the Council area into priority low, medium and high routes. An excerpt of the document is provided in Figure 2.20.

Figure 2.20: Pedestrian Route Priorities excerpt)

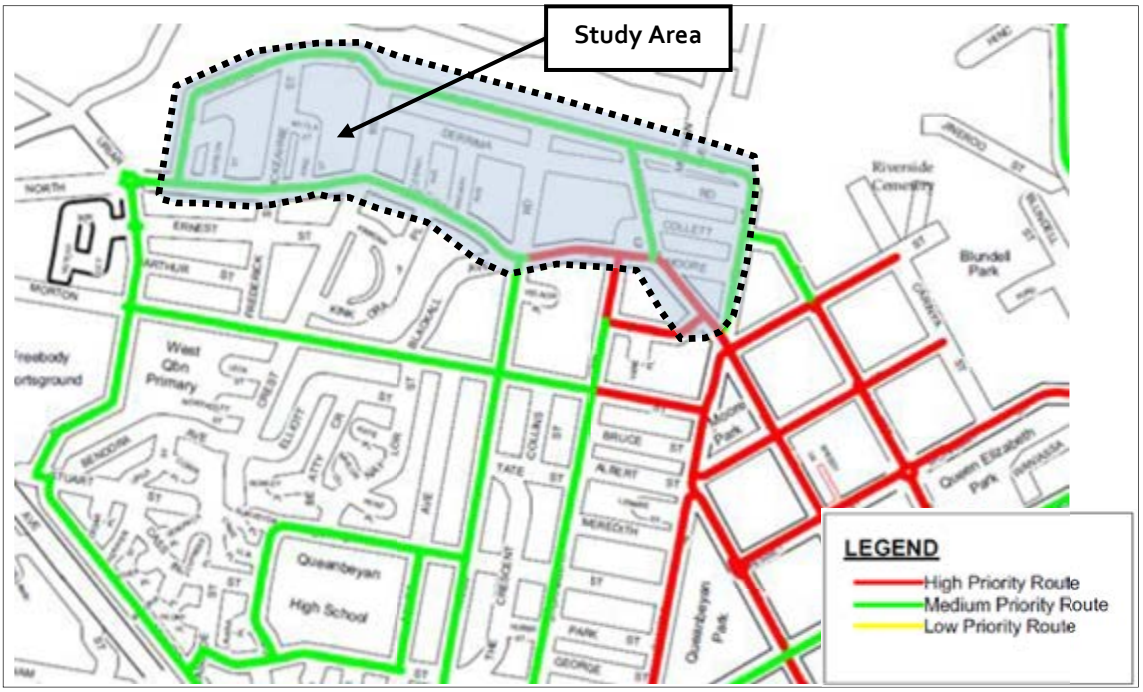
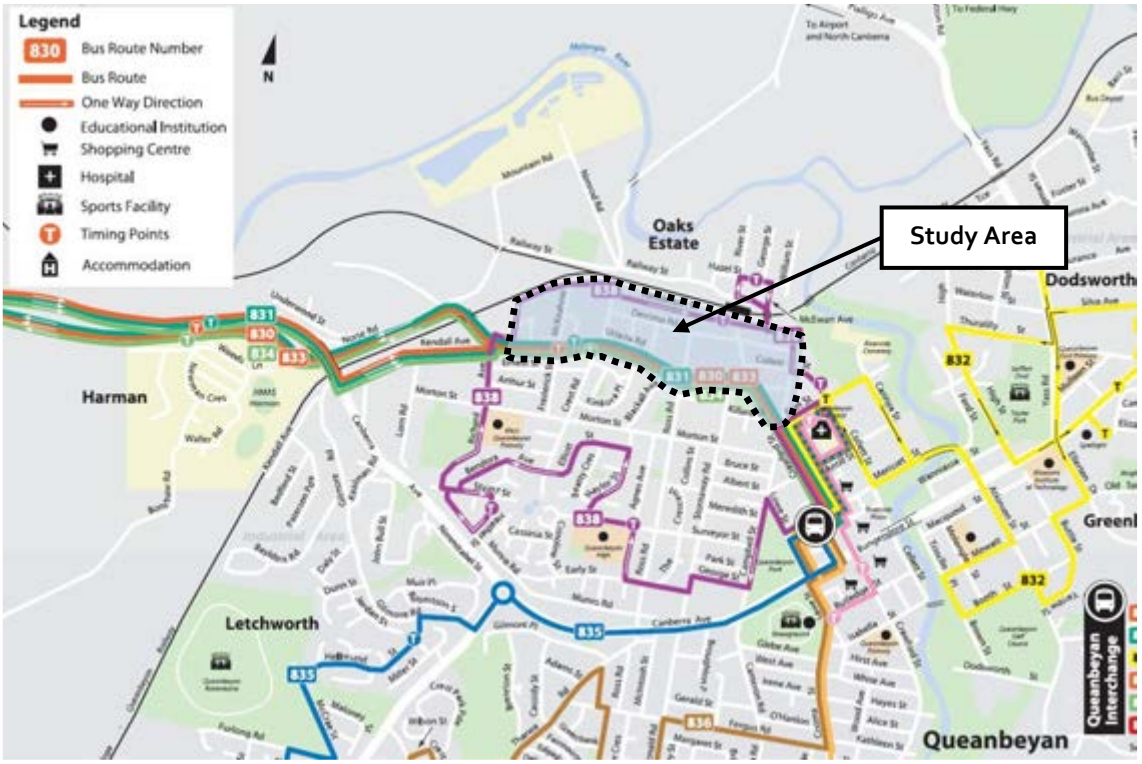


Figure 2.20 indicates that Uriarra Road, Henderson Road and Morton Street are identified east-west routes and Campbell Street, Crawford Street and Ross Street are identified north-south routes.

2.10 Public Transport

The study area is served by several bus routes operated by Deane's Buslines. The network of bus routes and location of Queanbeyan railway station are shown in Figure 2.21.

Figure 2.21: Bus Routes in Study Area



(Source: www.deanesbuslines.com.au)

A summary of the public transport options available in the area is summarised in Table 2.12.

Table 2.12: Public Transport Options

Service	Route	Route Description	Location of Stops	Operating Period / Frequency
Bus	830	Queanbeyan to City (Civic)	Three stops on Uriarra Road between Crawford Street and Richard Avenue in each direction.	Daily service
Bus	833	Queanbeyan to City (Civic) – Express Service	Three stops on Uriarra Road between Crawford Street and Richard Avenue in each direction.	Monday to Friday peak hour service
Bus	831	Queanbeyan to Woden	Three stops on Uriarra Road between Crawford Street and Richard Avenue in each direction.	Monday to Saturday service
Bus	834	Queanbeyan to Canberra Airport Loop Service	Three stops on Uriarra Road between Crawford Street and Richard Avenue in each direction.	Monday to Saturday service
Bus	838	Queanbeyan Loop Service	Various locations	Monday to Friday service
Railway	Canberra XPLORER	Sydney to Canberra	Queanbeyan railway station	Twice daily
Coach	CountryLink Coach	Queanbeyan to Melbourne (Southern Cross)	Queanbeyan railway station	Once daily

2.11 Resident and Business Consultation

In conjunction with Queanbeyan City Council, a questionnaire was prepared and distributed to all residents and businesses within the study area along with a number of residents south of Uriarra Road. Two separate questionnaires were distributed; one for residents and businesses north of Uriarra Road and one for those to the south. The questionnaires contained four questions for both groups of residents, with an additional question for residents and businesses north of Uriarra Road regarding parking.

The purpose of the survey was to identify current intersection safety, intersection delay, pedestrian and cycling, parking and other relevant transport issues, which would be considered as part of the study. Approximately 2,000 questionnaires were distributed with a total of 157 responses received (8% response rate). This included 94 north of Uriarra Road and 63 south of Uriarra Road. Some of the key findings are presented in Figure 2.22 to Figure 2.26 with full results provided in Appendix E.

Question 1a asked respondents which intersections they believed were unsafe for turning vehicles. A summary of the responses is presented in Figure 2.22.

Figure 2.22: Q1a. Which of the following intersections (if any), do you believe are unsafe for turning vehicles?

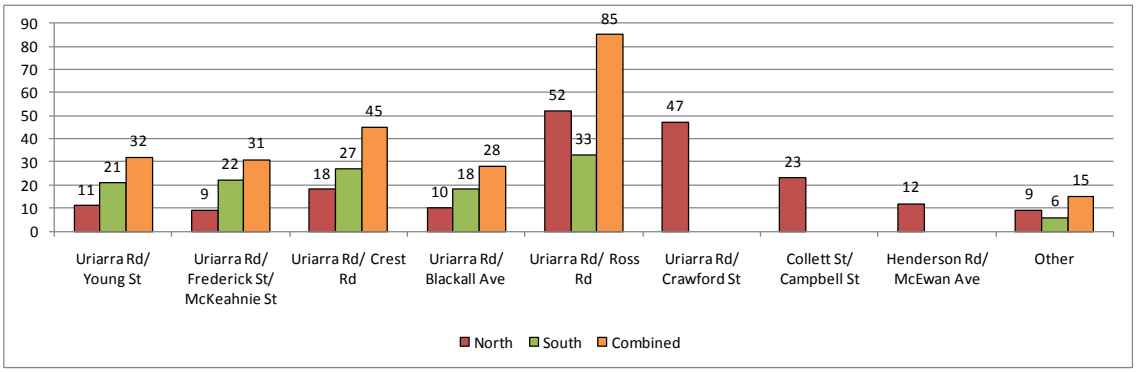


Figure 2.22 indicates that 85 respondents (approximately 54% of all respondents) selected the intersection of Uriarra Road and Ross Road as being unsafe for turning vehicles. The residents north of Uriarra Road also noted the intersection of Uriarra Road / Crawford Street as a concern. The intersection of Uriarra Road / Crest Road was also nominated as a concern by residents to the north and south of Uriarra Road.

Question 1b asked respondents which intersections they experienced delays at when turning. A summary of the responses is presented in Figure 2.23.

Figure 2.23: Q1b. Which of the following intersections (if any), do you experience delays when turning?

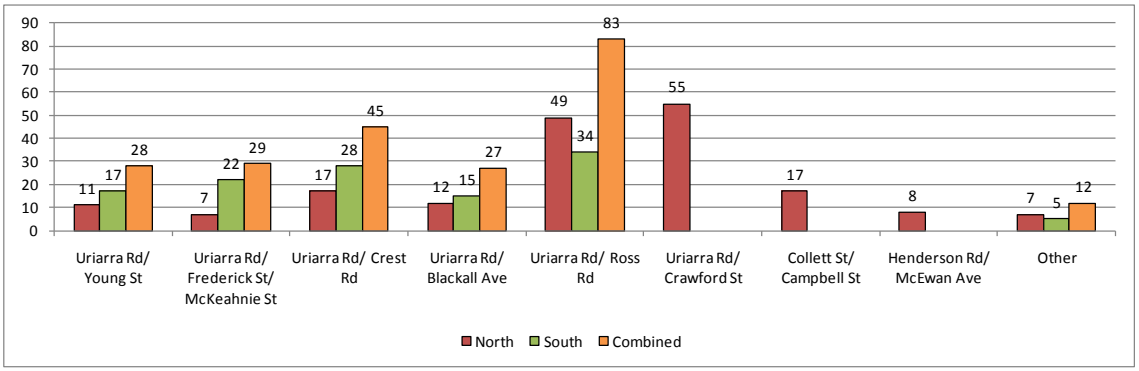


Figure 2.23 indicates that 83 (approximately 53% of all respondents selected the intersection of Uriarra Road and Ross Road as having experienced delays when turning. Similarly Uriarra Road/ Crawford Street and Uriarra Road/ Crest Road were also selected as having delays when turning at 35% and 29% respectively. It should be noted that for responses from residents north of Uriarra Road only, Uriarra Road/ Crawford Street was the most selected intersection for delays when turning.

Question 2 asked respondents what they considered to be key pedestrian issues in the area. A summary of the responses is presented in Figure 2.24.

Figure 2.24: Q2. What do you consider to be the key pedestrian issues in the area?

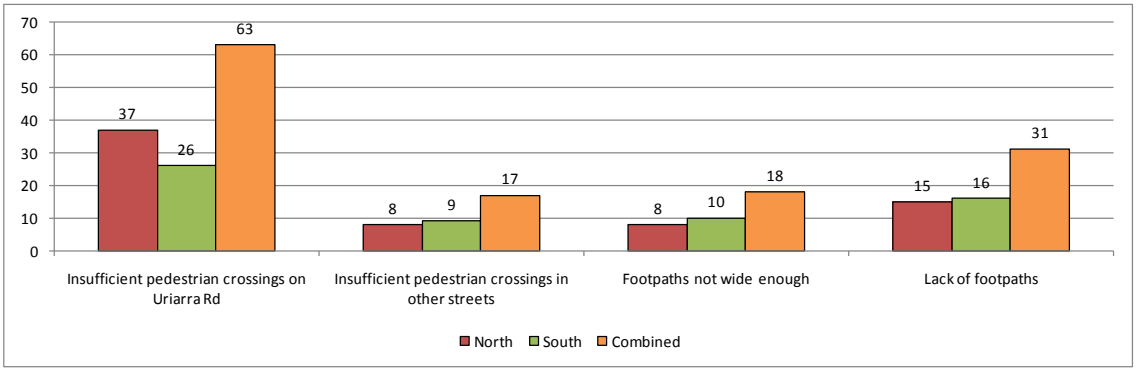


Figure 2.24 indicates that respondents identified the insufficient number of pedestrian crossings on Uriarra Road as a key pedestrian issue in the area with 63, approximately 40% of all responses. Another pedestrian issue with approximately 20% of all respondents was the lack of footpaths in the study area. This was considered more important than additional pedestrian crossings on other streets or narrow footpaths.

Question 3 asked respondents what they considered being key issues affecting cyclists in the area. A summary of the responses is presented in Figure 2.25.

Figure 2.25: Q3. What do you consider to be the key issues affecting cyclists in the area?

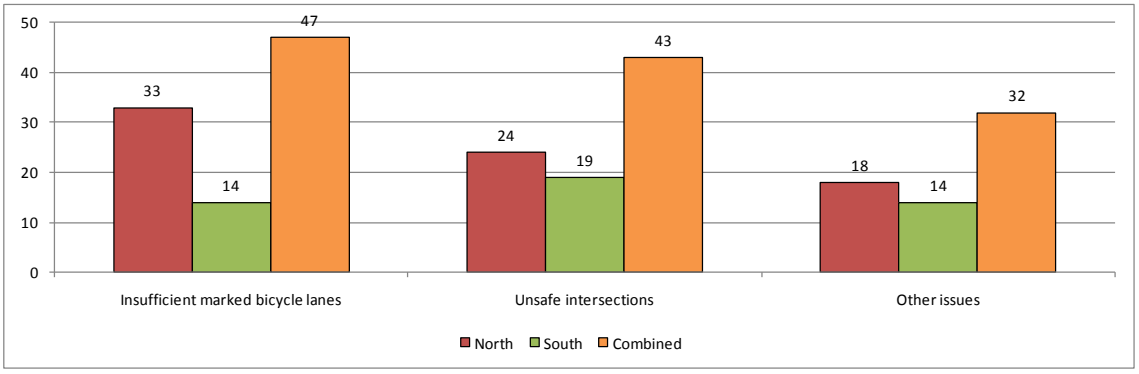


Figure 2.25 indicates that 47, approximately 30% of all respondents, identified insufficient marked bicycle lanes as an issue affecting cyclists. Unsafe intersections (27% of all respondents) were also considered important.

Question 4 asked respondents from the north of Uriarra Road the difficultly level of finding a parking space in the area. A summary of the responses is presented in Figure 2.26.

Figure 2.26: Q4. How would you rate the ease of finding a parking space in the area?

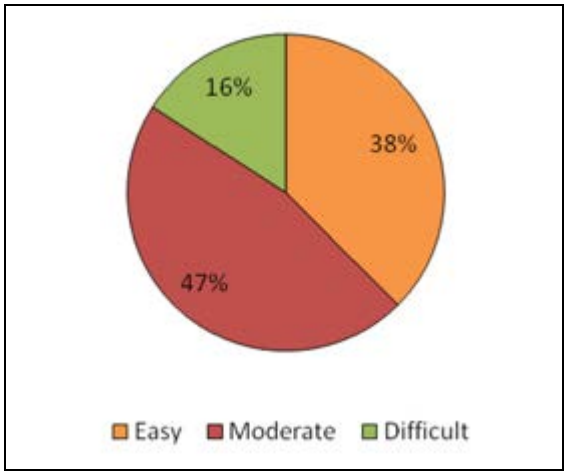


Figure 2.26 indicates that 85% of respondents north of Uriarra Road found parking in the area easy to moderate which verifies the finding from the parking demand survey which found that there was a 16% peak demand at 11:00am on Thursday and 18% peak demand at 4:00pm on Saturday. Based on the car parking survey results and the community survey results parking is not considered an area wide issue.

2.11.1 Other Common Issues

Respondents were also given the opportunity to raise concerns or comment on other transport issues in the area, the outcomes of which are summarised as follows:

Traffic

- Traffic lights were suggested at the intersection of Uriarra Road and Ross Road to improve right-turn movements and pedestrian crossing as the crest and curve in Uriarra Road at this location affects visibility. Other intersections nominated for traffic lights included:
    - Uriarra Road / Blackall Avenue
    - Uriarra Road / Crawford Street
    - Uriarra Road / McKeahnie Street/ Frederick Street
    - Henderson Road / McEwan Street
    - Collett Street / Crawford Street
    - Collett Street / Campbell Street.
- Blind spots at intersections as a result of cars parked or garbage bins left close to intersections.
- Reducing speeding with respondents suggesting traffic calming devices such as roundabouts and speed humps.
- Road narrowing as a result of vehicles parked on both sides of the street which can make two-way flow difficult. Suggestions to turn streets such as Derrima Road, Ross Road, Collett Street between Crawford Street and Campbell Street, and Crest Road to one-way.
- Increased heavy vehicle movement particularly on Ernest Road and Uriarra Road affecting traffic and pedestrian movement.

Pedestrians

- Visibility of pedestrians crossing Uriarra Road is poor when the sun is setting as well as at night due to poor lighting.
- More pedestrian crossing locations along Uriarra Road are required in more visible locations.
- Pedestrian facilities such as footpaths and pedestrian islands are in poor condition or not designed to appropriate standards.

Cyclists

- Constructing shared paths particularly along Uriarra Road to keep traffic separated from cyclists.
- Installation of bicycle parking facilities near retail areas.

Parking

- Respondents highlighted concern of residents from some apartment blocks parking on the streets and concerns that future development will result in future on-street parking demands.
- Difficulty finding parking around the intersection of Uriarra Road and Crawford Street as a result of the nearby pub.
- Visitor parking sometimes obstructing residential driveways.

General

- Uriarra Road was commonly identified as a concern for respondents in regards to traffic flow, cycling, pedestrian movement, parking and reversing out of driveways, in particular during the peak hours.

2.12 Summary of Existing Conditions

Based on the site inspections, existing conditions assessment of traffic and parking and the community responses, the following observations and recommendations can be made:

- Community responses suggest that the intersections of Uriarra Road / Ross Road, Uriarra Road / Crest Road and Uriarra Road / Crawford Street are the most problematic in the study area.
- The observations and modelling undertaken by GTA Consultants indicate that the intersections of Uriarra Road / Ross Road, Uriarra Road / Crest Road and Uriarra Road / Crawford Street are subject to the highest delays, highest degrees of saturation and worst levels of service.
- The community responses are consistent with the modelling outcomes.
- It is recommended that the resident responses and the modelling direct the focus of further investigation to these three intersections.
- It is recommended that treatment options at these intersections focus on improving the existing traffic conditions as well as catering for future traffic in the study area.

2.13 Recent Crash History

Queanbeyan City Council provided a summary of crash data within the study area for the last available five-year period. The crash data is summarised in Table 2.13.

Table 2.13: Summary of Recorded Crash History within the Study Area (2006 to 2010)

Year	Number of Crashes	Common RUMs				Crash Severity			Road Surface Conditions	Natural Lighting
		10 (Cross-Traffic)	30 (Rear End)	71 (Off Carriageway left, hit object)	32 (Right rear)	Fatality	Injury	Non-Injury / Tow-Away		
2006	9	2	2	1	-	1	4	4	Dry - 9	Day - 7, Dark - 2
2007	10	1	1	1	2	-	6	4	Dry – 7, Wet - 3	Dawn - 2, Day - 6, Dusk - 1, Dark – 1
2008	18	5	1	3	1	-	9	9	Dry – 17, Wet - 1	Day - 10, Dusk - 1, Dark – 7
2009	16	5	4	2	1	-	7	9	Dry - 16	Day - 13, Dusk - 1, Dark - 2
2010	2	-	-	-	1	-	2	-	Dry - 2	Day - 1, Dark - 1
Total	55	13	8	7	5	1	28	26	Dry – 51 Wet - 4	Dawn - 2, Day - 37, Dusk - 3, Dark - 13

Table 2.13 indicates that there were a total of 55 recorded crashes within the study area in the last available 5-year period. There was 1 fatality, 28 injury crashes and 26 non-injury / tow-away crashes. A total of 93% of all crashes occurred in dry conditions. A total of 67% of all crashes occurred during daylight hours.

The recorded crash history can be summarised in more detail as follows:

- A total of 33 out of the 55 recorded crashes occurred at locations at or within 10m of an intersection. The remaining 22 occurred on a divided or undivided road length.
- The fatality that occurred during 2006, involved a pedestrian struck by a vehicle while crossing Crawford Street 11m from the intersection whilst the vehicle had turned left onto the street from Uriarra Road.

Common Road User Movement (RUM) data shows that:

- 17 crashes involved vehicles from adjacent directions
- 13 crashes involved rear-end collision
- 11 crashes involved a vehicle leaving the road and colliding with an object or parked vehicle
- 5 crashes involved the vehicle 'losing control' or going 'off-path'
- 4 crashes involved pedestrians
- 3 crashes involved opposing directions.

The locations where most recorded crashes occurred include:

- Uriarra Road / Crawford Street – 5 crashes (1 fatality, 3 injury and 1 non-injury)
- Uriarra Road / McKeahnie Street / Frederick Street – 5 crashes (3 injury, 2 non-injury)
- Uriarra Road / Crest Road – 5 crashes (1 injury, 4 other)
- Uriarra Road / Ross Road – 4 crashes (1 injury, 3 other).

One crash occurred at the driveway of 17 Uriarra Road in 2007, resulting in an injury. This is the only recorded crash in the vicinity of this driveway.

Full crash data is provided in Appendix A.

2.14 ABS Car Ownership Data

GTA Consultants has reviewed the 2006 car ownership data for the postcode 2620 which covers a number of suburbs including Crestwood and Queanbeyan. A summary is provided in Table 2.14 for separate houses and in Table 2.15 for Apartments.

Table 2.14: Summary of 2006 ABS Car Ownership Data for Postcode 2620 for Separate Houses

Number of Bedrooms (Number of Dwellings)					
0 – (0)	1 (118)	2 (793)	3 (3,871)	4 (2,967)	5 + (804)
N/A	1.09	1.41	1.76	2.27	2.65

Table 2.15: Summary of 2006 ABS Car Ownership Data for Postcode 2620 for Apartments

Number of Bedrooms (Number of Dwellings)					
0 – Studio (45)	1 (629)	2 (1,352)	3 (109)	4 (8)	5 + (0)
0.47	0.87	1.08	1.41	1.63	N/A

N/A – Not Applicable

Table 2.14 and Table 2.15 indicate that car ownership rates are higher for separate houses when compared to apartments. The 2006 car ownership rates are lower than the current DCP car parking requirements for apartments within the study area.

3. Background Traffic Growth Impacts

Development outside the North Crestwood study area will affect the volumes on Uriarra Road resulting in higher volumes in the future. The following sections outline the methodology used to determine the background traffic growth that is expected to occur to the year 2031.

3.1 Additional Traffic Volumes

The Googong and Tralee Traffic Study (2031) prepared by Gabites Porter, dated April 2010, has been used to determine the traffic growth rate on Uriarra Road between 2009 and 2031. The 2009 traffic volumes for the AM and PM peak hours were presented in plans App 1-1 and App 1-3 respectively with the 2031 traffic volumes on the existing road network (which can be considered conservative) were presented in App 3-1 and App 3-3 for the AM and PM peak hours respectively. Figure 3.1 to Figure 3.4 are extracts from the plans with the volumes used in the future analysis circled. Analysis of the increase in volumes on selected road links within or adjacent to the study area were used to determine the increase in traffic along Uriarra Road as a result of future residential development outside North Crestwood, particularly to the east of Queanbeyan.

The future analysis by Gabites Porter included some additional residential dwellings in Queanbeyan, which covers part of the study area. Information provided by Queanbeyan City Council since the report was released in April 2010 suggests that the number of future additional dwellings will be higher than originally envisaged. Based on the changes to the expected number of additional dwellings within the study area, the Gabites Porter analysis is considered an accurate reflection of the development across the wider study area.

Figure 3.1: 2009 AM Peak Two Way Volumes – Gabites Porter – App 1-1

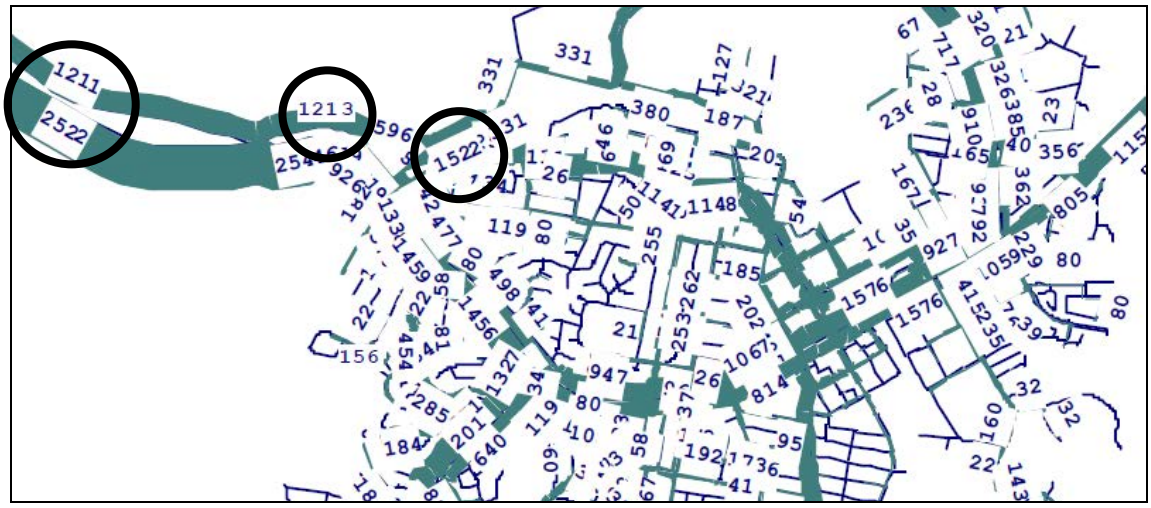


Figure 3.2: 2031 AM Peak Two Way Volumes – Gabites Porter – App 1-3

Figure 3.3: 2009 PM Peak Two Way Volumes – Gabites Porter – App 3-1

Figure 3.4: 2031 PM Peak Two Way Volumes – Gabites Porter – App 3-3

The traffic volumes are summarised in Table 3.1.

Table 3.1: Googong and Tralee Traffic Study (2031) – Uriarra Road Traffic Volumes

Year	AM	PM
2009 (sum of circled values)	6468	7291
2031 (sum of circled values)	7786	8959
Increase	1318 (20.4%)	1668 (22.9%)

Using the traffic volumes presented in Table 3.1, the traffic growth over the period of 2009 to 2031 are 20.4% and 22.9% for the AM and PM peak hours respectively. As part of the future assessment, the peak hour volumes on Uriarra Road eastbound at the intersection of Uriarra Road / Young Street and Uriarra Road / Crawford Street were increased by 20.4% (AM) and 22.9% (PM). It was assumed that there was no change in traffic volumes from 2009 to 2011.

The base 2031 traffic volumes are shown in Figure 3.5 and Figure 3.6.

Figure 3.5: Anticipated 2031 Base AM Volumes

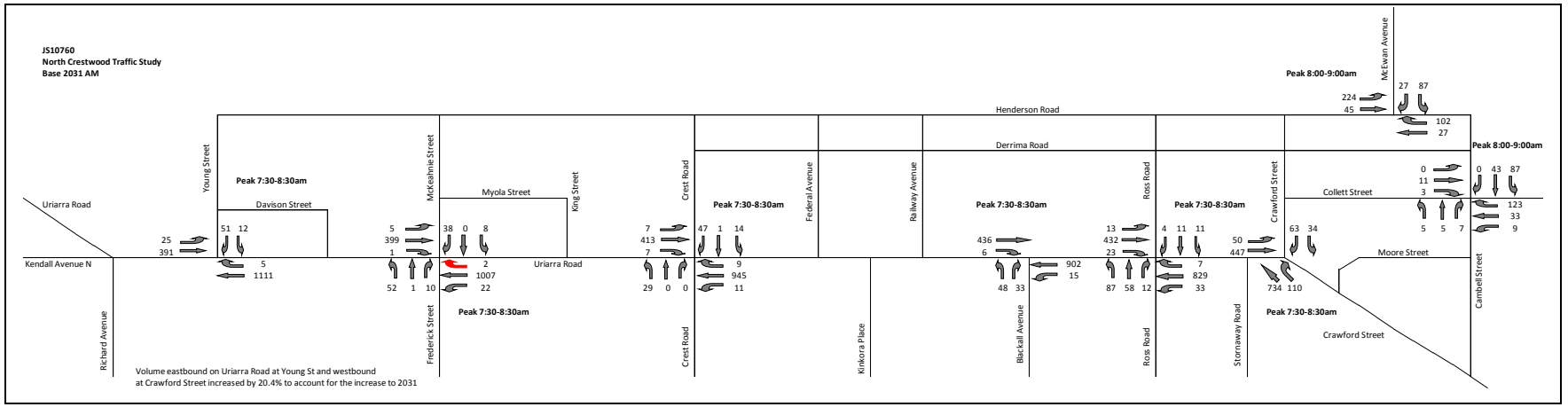
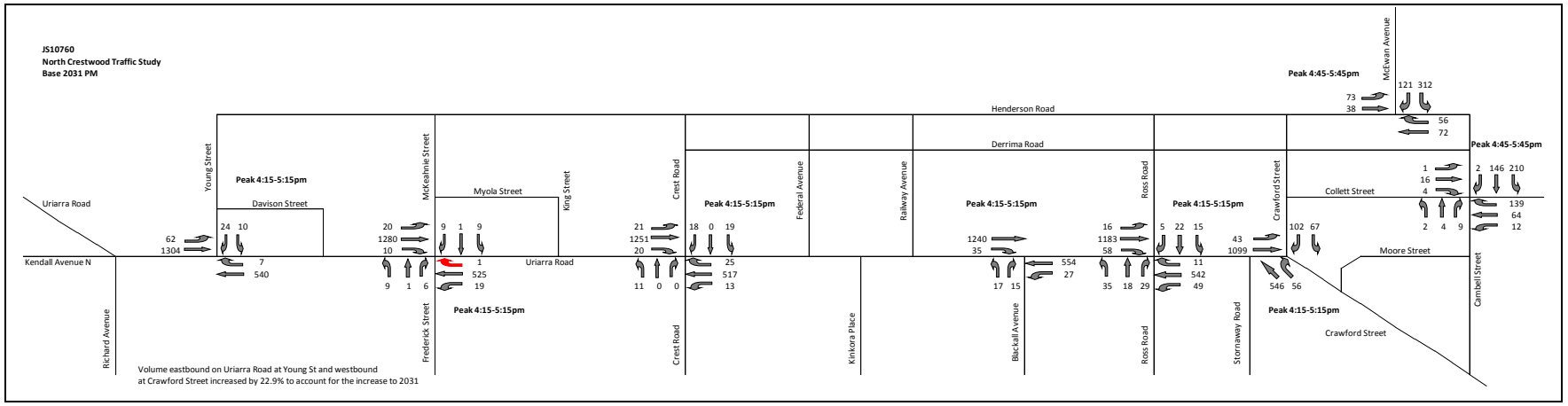


Figure 3.6: Anticipated 2031 Base PM Volumes



3.2 Operational Assessment

Based on the methodology outlined in Section 3.1, Table 3.2 to Table 3.9 present a summary of the expected future 2031 base operating conditions. This assessment is considered conservative as it assumes no change to the existing wider road network.

Table 3.2: Uriarra Road / Young Street Intersection – 2031 Base

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Uriarra Road E	0.63	9	124	A
	Young Street (Lane 1 - Left)	0.04	10	1	A
	Young Street (Lane 2 - Right)	0.70	74	15	F
	Uriarra Road W	0.24	1	0	A
	Overall	0.70	12	124	
Thu PM	Uriarra Road E	0.37	72	153	F
	Young Street (Lane 1 - Left)	0.17	64	3	E
	Young Street (Lane 2 - Right)	0.67	145	13	F
	Uriarra Road W	0.73	0	0	A
	Overall	0.73	23	153	

Table 3.2 indicates that in 2031 the intersection degree of saturation is expected increase from the 0.58 (level of service E) under existing conditions to 0.70 (level of service F) in 2031 during the AM peak hour.

During the PM peak hour, the intersection degree of saturation is expected to increase from 0.37 (level of service E) to 1.00 (level of service F) during the PM peak hour. Under 2031 base conditions, average delay to vehicles turning right from Young Street is expected to increase from 58 seconds to 74 seconds during the AM peak hour and from 65 seconds to 145 seconds during the PM peak hour.

The critical right turn gap acceptance value has been reduced from 5.5 seconds to 5 seconds to reflect the likely future operation and behaviour of the local users. This value is consistent with the Austroads Guide to Road Design Part 4A's accepted value for a right turn.

Table 3.3: Uriarra Road / Frederick Street / McKeahnie Street Intersection - 2031 Base

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Frederick Street (Lane 1 - Left)	0.32	30	7	C
	Frederick Street (Lane 2 – Through / Right)	0.16	53	3	D
	Uriarra Road E	0.58	7	104	A
	McKeahnie Street (Lane 1 - Left)	0.02	10	0	A
	McKeahnie Street (Lane 2 - Through / Right)	0.57	76	13	F
	Uriarra Road W	0.24	20	52	B
	Overall	0.58	14	104	
Thu PM	Frederick Street (Lane 1 - Left)	0.02	11	0	A
	Frederick Street (Lane 2 – Through / Right)	0.24	128	4	F
	Uriarra Road E	0.30	48	119	D
	McKeahnie Street (Lane 1 - Left)	0.12	51	2	D
	McKeahnie Street (Lane 2 - Through / Right)	0.32	128	6	F
	Uriarra Road W	0.71	14	153	A
	Overall	0.71	25	153	

Table 3.3 indicates that under 2031 base conditions, the intersection Uriarra Road / Frederick Street / McKeahnie Street is expected to operate with a maximum degree of saturation of 0.71 which is an increase from the current saturation of 0.58. Delay is expected to remain approximately the same during the AM peak hour however in the PM peak hour the delay to right turners from Frederick Street and McKeahnie Street is expected to increase from approximately 80 seconds to approximately 130 seconds for each movement.

The right turn gap acceptance values have been reduced from 7 seconds to 6 seconds to reflect the likely future operation and behaviour of the local users. This value is 1 second higher than the Austroads Guide to Road Design Part 4A's accepted value for a right turn.

Table 3.4: Uriarra Road / Crest Road Intersection - 2031 Base

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Crest Road S	0.14	22	3	B
	Uriarra Road E (Lane 1 - Through)	0.53	0	0	A
	Uriarra Road E (Lane 2 - Right)	0.01	10	0	A
	Crest Road N (Lane 1 - Left)	0.02	10	0	A
	Crest Road N (Lane 2 – Right / Through)	0.58	65	14	E
	Uriarra Road W (Lane 1 – Left/Through)	0.24	0	0	A
	Uriarra Road W (Lane 2 - Right)	0.02	18	1	B
	Overall	0.58	2.9	14	
Thu PM	Crest Road S	0.02	11	0	A
	Uriarra Road E (Lane 1 - Through)	0.29	0	0	A
	Uriarra Road E (Lane 2 - Right)	0.23	40	5	C
	Crest Road N (Lane 1 - Left)	0.26	57	5	E
	Crest Road N (Lane 2 – Right / Through)	0.56	146	11	F
	Uriarra Road W (Lane 1 – Left/Through)	0.69	0	0	A
	Uriarra Road W (Lane 2 - Right)	0.03	11	1	A
	Overall	0.69	3	11	

Table 3.4 indicates that when compared to the existing conditions, the degree of saturation of the intersection of Uriarra Road / Crest Road is expected to remain approximately the same. The delay for the right turn from Crest Road (north) is expected to increase from 105 seconds during the PM peak hour to 146 seconds.

The right turn gap acceptance values have been reduced from 7 seconds to 6 seconds to reflect the likely future operation and behaviour of the local users. This value is 1 second higher than the Austroads Guide to Road Design Part 4A's accepted value for a right turn.

Table 3.5: Uriarra Road / Blackall Avenue Intersection - 2031 Base

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Blackall Avenue (Lane 1 - Left)	0.20	21	5	B
	Blackall Avenue (Lane 2 – Right)	0.35	98	14	D
	Uriarra Road E	0.51	0	0	A
	Uriarra Road W (Lane 1 - Through)	0.24	0	0	A
	Uriarra Road W (Lane 2 - Right)	0.04	15	3	B
	Overall	0.51	2	8	
Thu PM	Blackall Avenue (Lane 1 - Left)	0.03	11	1	A
	Blackall Avenue (Lane 2 – Right)	0.40	117	8	F
	Uriarra Road E	0.32	0	0	A
	Uriarra Road W (Lane 1 - Through)	0.62	0	0	A
	Uriarra Road W (Lane 2 - Right)	0.09	6	4	A
	Overall	0.62	2	8	

Table 3.5 indicates that when compared to the existing conditions, the degree of saturation of the intersection of Uriarra Road / Blackall Avenue is expected to remain approximately the same. The delay for the right turn from Blackall Avenue is expected to increase from 53 seconds to 98 seconds during the AM peak hour and from 91 seconds to 117 seconds during the PM peak hour.

The right turn gap critical acceptance value has been reduced from 7 seconds to 6 seconds to reflect the likely future operation and behaviour of the local users. This value is 1 second higher than the Austroads Guide to Road Design Part 4A's accepted value for a right turn.

Table 3.6: Uriarra Road / Ross Road Intersection - 2031 Base

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Ross Road S (Lane 1 - Left)	0.31	23	8	B
	Ross Road S (Lane 2 – Through / Right)	0.69	70	20	E
	Uriarra Road E (Lane 1 – Left / Through)	0.49	0	0	A
	Uriarra Road E (Lane 2 - Right)	0.01	10	0	A
	Ross Road N (Lane 1 - Left)	0.04	14	1	A
	Ross Road N (Lane 2 – Through / Right)	0.18	50	4	D
	Uriarra Road W (Lane 1 – Left / Through)	0.26	0	0	A
	Uriarra Road W (Lane 2 - Right)	0.06	16	1	B
	Overall	0.69	6	20	
Thu PM	Ross Road S (Lane 1 - Left)	0.07	14	2	A
	Ross Road S (Lane 2 – Through / Right)	1.00	267	41	F
	Uriarra Road E (Lane 1 – Left / Through)	0.32	1	0	A
	Uriarra Road E (Lane 2 - Right)	0.07	27	1	B
	Ross Road N (Lane 1 - Left)	0.18	43	3	D
	Ross Road N (Lane 2 – Through / Right)	0.69	166	15	F
	Uriarra Road W (Lane 1 – Left / Through)	0.64	0	0	A
	Uriarra Road W (Lane 2 - Right)	0.08	11	2	A
	Overall	0.64	10	41	

Table 3.6 indicates that during the AM peak hour, the degree of saturation and delays are expected increase only slightly with no change to level of service. During the PM peak hour, degree of saturation is expected to increase from 0.87 to 1.00 on the north approach and from 0.44 to 0.69 on the south approach. Average delays are expected to increase from 97 seconds to 267 seconds on the north approach and from 61 seconds to 166 seconds on the south approach.

Table 3.7: Uriarra Road / Crawford Street Intersection - 2031 Base

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Crawford Street E (Lane 1 - Through)	0.41	0	0	A
	Crawford Street E (Lane 2 - Right)	0.15	11	4	A
	Crawford Street N (Lane 1 - Left)	0.06	11	1	A
	Crawford Street N (Lane 2 - Right)	0.48	38	11	C
	Uriarra Road W	0.28	1	0	A
	Overall	0.48	3	11	
Thu PM	Crawford Street E (Lane 1 - Through)	0.29	0	0	A
	Crawford Street E (Lane 2 - Right)	0.27	26	6	B
	Crawford Street N (Lane 1 - Left)	0.44	36	10	C
	Crawford Street N (Lane 2 - Right)	1.05	158	62	F
	Uriarra Road W	0.60	0	0	A
	Overall	1.05	11	62	

Table 3.7 indicates that during the AM peak hour, the degree of saturation and delays are expected to remain approximately the same. During the PM peak hour, degree of saturation is expected to increase from 0.74 to 1.05 with average delays expected to increase from 52 seconds to 158 seconds.

Table 3.8: Campbell Street / Collett Street Intersection - 2031 Base

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Campbell Street S	0.01	5	0	A
	Collett Street E	0.22	8	7	A
	Campbell Street N	0.08	4	3	A
	Collett Street W	0.02	7	1	A
	Overall	0.22	6	7	
Thu PM	Campbell Street S	0.01	7	0	A
	Collett Street E	0.38	11	15	A
	Campbell Street N	0.21	4	9	A
	Collett Street W	0.04	9	1	A
	Overall	0.38	7	15	

Table 3.8 indicates that the intersection operation is not expected to change with levels of service remaining at A for both the AM and PM peak hours.

Table 3.9: Henderson Road / McEwan Avenue Intersection - 2031 Base

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Henderson Road E	0.12	7	4	A
	McEwan Avenue N	0.15	8	4	A
	Henderson Road W	0.16	5	0	A
	Overall	0.16	6	4	
Thu PM	Henderson Road E	0.09	3	3	A
	McEwan Avenue N	0.52	9	26	A
	Henderson Road W	0.07	4	0	A
	Overall	0.52	7	26	A

Table 3.9 indicates that intersection operation is not expected to change with levels of service remaining at A for both the AM and PM peak hours.

3.3 Summary of Operational Assessment

Based on the analysis presented within Section 3.2, the following intersections are expected to experience a significant increase in the degree of saturation as a result of background traffic growth:

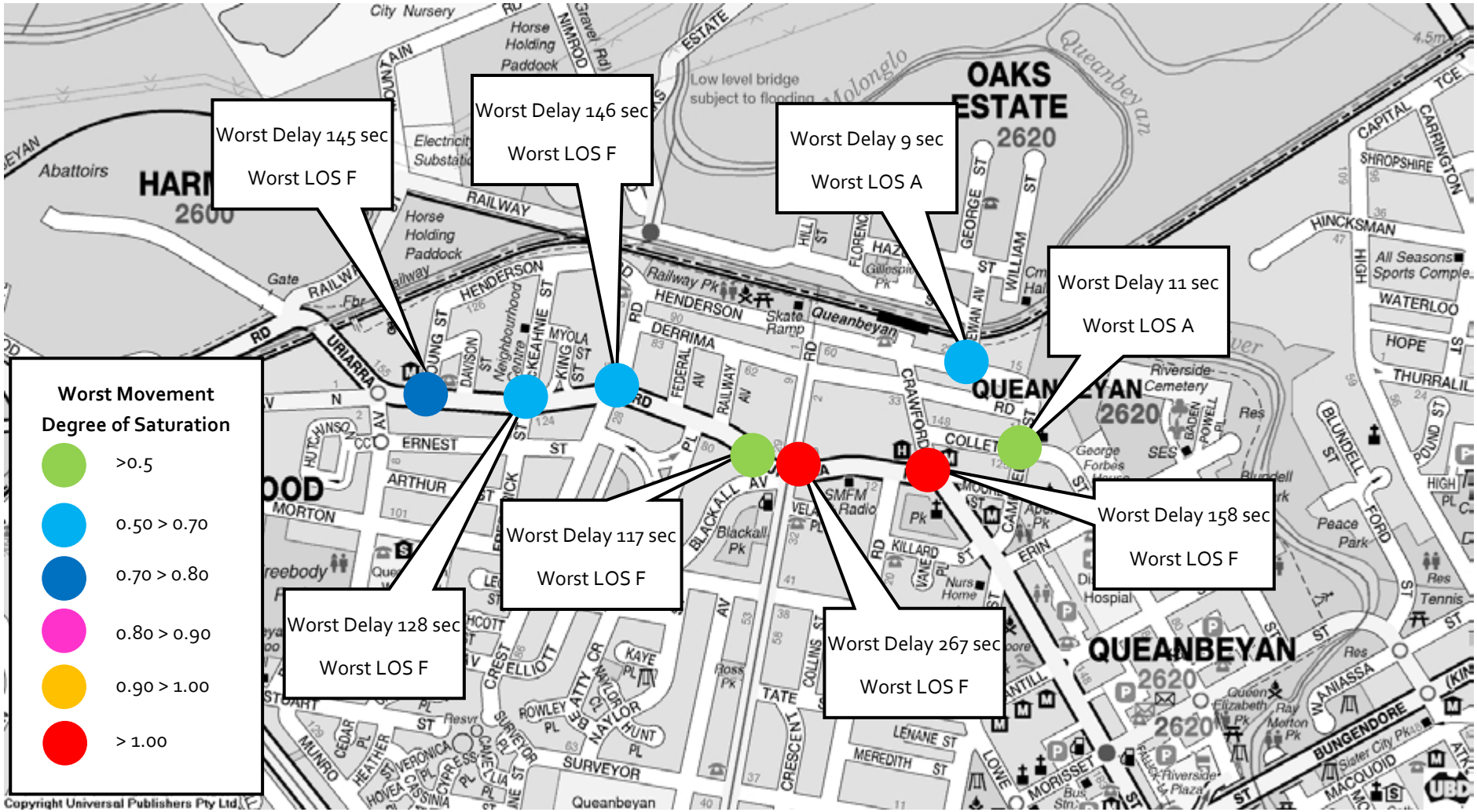
- Uriarra Road / Crawford Street
- Uriarra Road / Ross Road.

The following intersections are expected to experience a significant increase in delay as a result of background traffic growth:

- Uriarra Road / Young Street
- Uriarra Road / McKeahnie Street
- Uriarra Road / Crest Road.

The future operation of the intersections within the study area is summarised in Figure 3.7.

Figure 3.7: Summary of 2031 Base Intersection Operation



4. Future Development Impacts

4.1 Future Development

The number of additional dwellings expected to be constructed within the Queanbeyan City Council were provided to GTA Consultants as part of Addendum No. 1 of the North Crestwood Traffic Study Brief. The method used to determine the additional traffic volumes from the additional dwellings at each intersection within the study area is set out in the following sections. A summary by census collector district is provided in Table 4.1.

Table 4.1: Total Additional Dwellings Constructed by 2031

Census Collector District	Number of Dwellings [1]
1170201	124
1170203	35
1170212	108
1170205	177
1170202	145
1170204	113
1170206	85
1170102	160
Total	947

[1] Includes apartments and dual occupancy developments.

Table 4.1 indicates that a total of 947 additional dwellings could be constructed up to 2031.

4.2 Traffic Generation

A summary of the analysis of the additional traffic generated by the additional dwellings in Table 4.1 is set out in the following sections.

4.2.1 Future Traffic Generation Rates

Traffic generation rates were sourced from the RTA Guide to Traffic Generating Developments, 2002 which indicates a rate of 0.85 movements per dwelling and 0.5 movements per dwelling for multi-unit residential developments. Where dwelling types were identified in the Queanbeyan City Council information as 'either' a conservative rate of 0.85 movements per dwelling was used. These rates were used as the basis for the future the traffic generation assessment.

4.2.2 Traffic Distribution

The ratio of inbound traffic to outbound traffic was based on the surveys at the following intersections:

- Uriarra Road / Young Street
- Uriarra Road / Frederick Street / McKeahnie Street
- Uriarra Road / Crest Road.

The ratio of inbound traffic for the AM peak hour was found to be 75% out / 25% in and during the PM peak hour the ratio was found to be 64% in and 36% out. These values were used as the basis for the future assessment.

4.2.3 Total Trips and Census Area Distribution

The study area is bound by a number of census collector districts which are shown in Figure 4.1.

Figure 4.1: Census Collector Districts

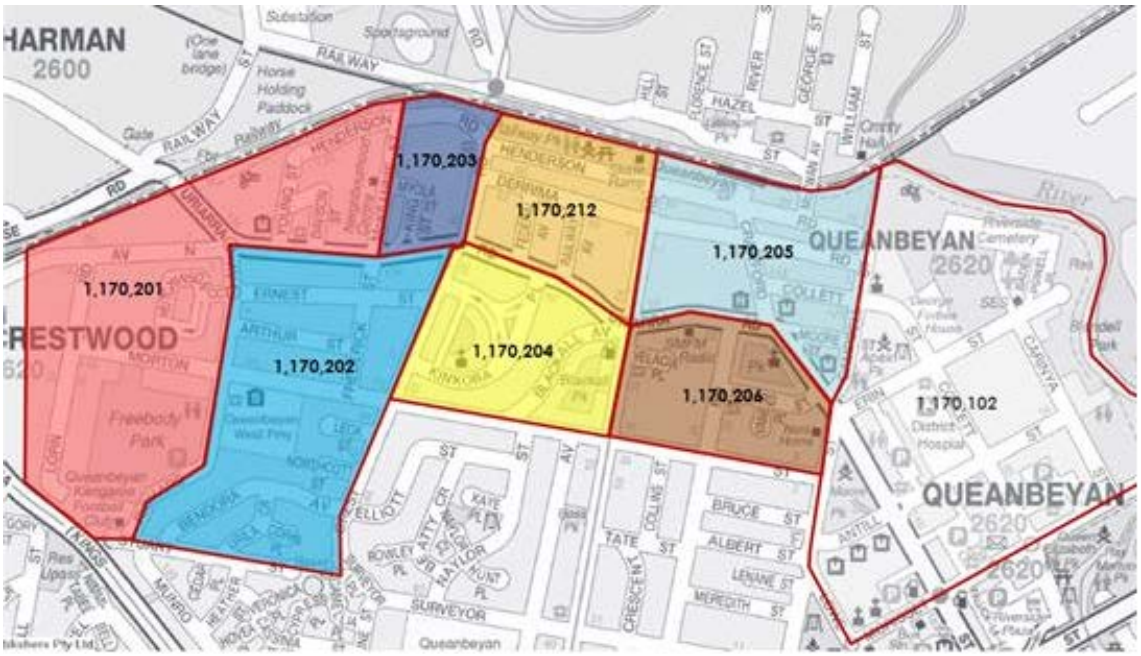


Figure 4.1 indicates that there are 8 census collector districts that adjoin or are likely to affect the study area. It is envisaged that a total of 947 dwellings would be constructed within the 8 census collector districts as indicated in Table 4.1.

A summary of the expected number of vehicle movements associated with each census collector district is provided in Table 4.2.

Table 4.2: In / Out Volume Distribution for each Census Collector District

Census Collector District	Number of Dwellings [1]	Hourly Movements [2]	AM		PM	
			In 25%	Out 75%	In 64%	Out 36%
1170201	124	62	16	47	40	22
1170203	35	19	5	14	12	7
1170212	108	66	16	49	42	24
1170205	177	93	23	70	59	33
1170202	145	113	28	85	73	41
1170204	113	71	18	53	45	26
1170206	85	55	14	42	35	20
1170102	160	88	22	66	57	32
Total	947	567	142	426	363	204

[1] Includes apartments and dual occupancy developments.
[2] 0.5 movements per hour for apartments and 0.85 movements per dwelling for dual occupancy developments. Minor differences between the total hourly flows and AM / PM flows are due to rounding.

Table 4.2 indicates that there are a total of 947 dwellings proposed in the census collector districts surrounding the study area resulting in a total of 567 additional peak hour movements. Further analysis of the expected additional traffic volumes on roads within the study area is provided in the following section.

4.2.4 Street by Street Traffic Distribution

The number of expected additional volumes distributed to each road is summarised in Table 4.3.

Table 4.3: Total Additional Movements Distributed to Each Road

Census Collector District	Road	Percentage Distribution	AM		PM	
			In 25%	Out 75%	In 64%	Out 36%
1170201	Young Street	80%	12	37	32	18
	McKeahnie Street	0%	0	0	0	0
	Henderson Road	20%	4	10	8	4
1170203	McKeahnie Street	45%	2	6	6	3
	Crest Road N	45%	2	6	6	3
	Henderson Road	10%	1	2	0	1
1170212	Crest Road N	30%	5	15	13	7
	Federal Avenue	20%	3	10	8	5
	Railway Avenue	20%	3	10	8	5
	Ross Road N	20%	3	10	8	5
	Henderson Road	10%	2	4	5	2
1170205	Ross Road N	65%	15	45	39	22
	Crawford Street	20%	5	14	12	7
	Henderson Road	10%	2	7	6	3
	Campbell Street	5%	1	4	2	1
1170202	Richard Avenue	30%	9	26	22	12
	Frederick Street	40%	5	34	29	16
	Crest Road S	30%	14	26	22	12
1170204	Crest Road S	50%	9	27	23	13
	Kinkora Place	20%	4	11	9	5
	Blackall Avenue	30%	5	15	13	8
1170206	Ross Road S	30%	4	12	11	6
	Stornaway Road	50%	7	21	18	10
	Killard Street	20%	3	8	7	4
1170102	Henderson Road	5%	1	3	3	2
	Campbell Street	5%	1	3	3	2
	Out of Study Area	90%	20	60	51	28
Total Movements			142	425	364	204

The volumes associated with each road in Table 4.3 are summarised in Table 4.4.

Table 4.4: Summary of Total Additional Movements Distributed to Each Road

Road	AM			PM		
	In 25%	Out 75%	Total	In 25%	Out 75%	Total
Young Street	12	37	49	32	18	50
McKeahnie Street	2	6	8	6	3	9
Crest Road N	7	21	28	19	10	29
Federal Avenue	3	10	13	8	5	13
Railway Avenue	3	10	13	8	5	13
Ross Road N	18	55	73	47	27	74
Crawford Street	5	14	19	12	7	19
Richard Avenue	9	26	35	22	12	34
Frederick Street	11	34	45	29	16	45
Crest Road S	17	53	70	45	25	70
Kinkora Place	4	11	15	9	5	14
Blackall Avenue	5	15	20	13	8	21
Ross Road S	4	12	16	11	6	17
Stornaway Road	7	21	28	18	10	28
Killard Street	3	8	11	7	4	11
Henderson Road	10	26	36	22	12	34
Campbell Street	2	7	9	5	3	9
Out of Study Area	20	60	80	51	28	78
Total Movements	**142**	**425**	**567**	**364**	**204**	**568**

Table 4.4 indicates that the roads most additional vehicles will be distributed to include Ross Road North, Crest Road South and Young Street. In order to determine the expected additional turning movements at each intersection within the study area, the expected additional volumes were distributed in accordance with the existing turning proportions. The anticipated additional volumes as a result of future development are shown in Figure 4.2 and Figure 4.3 with anticipated 2031 post development volumes provided in Figure 4.4 and Figure 4.5.

Figure 4.2: Anticipated Additional Development Volumes AM Peak Hour

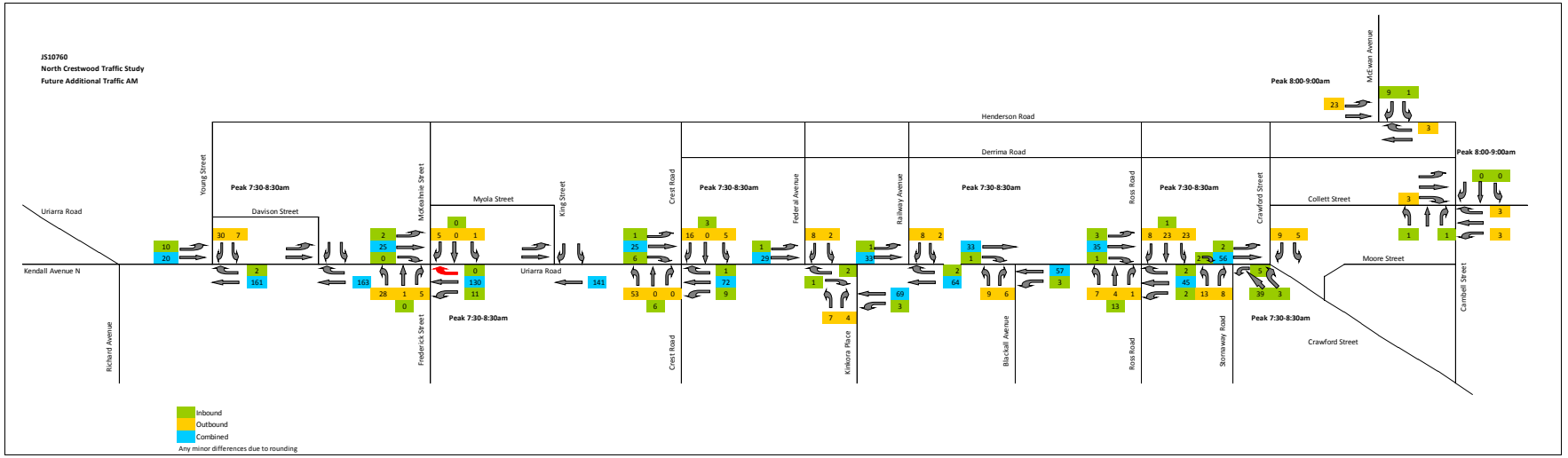


Figure 4.3: Anticipated Additional Development Volumes PM Peak Hour

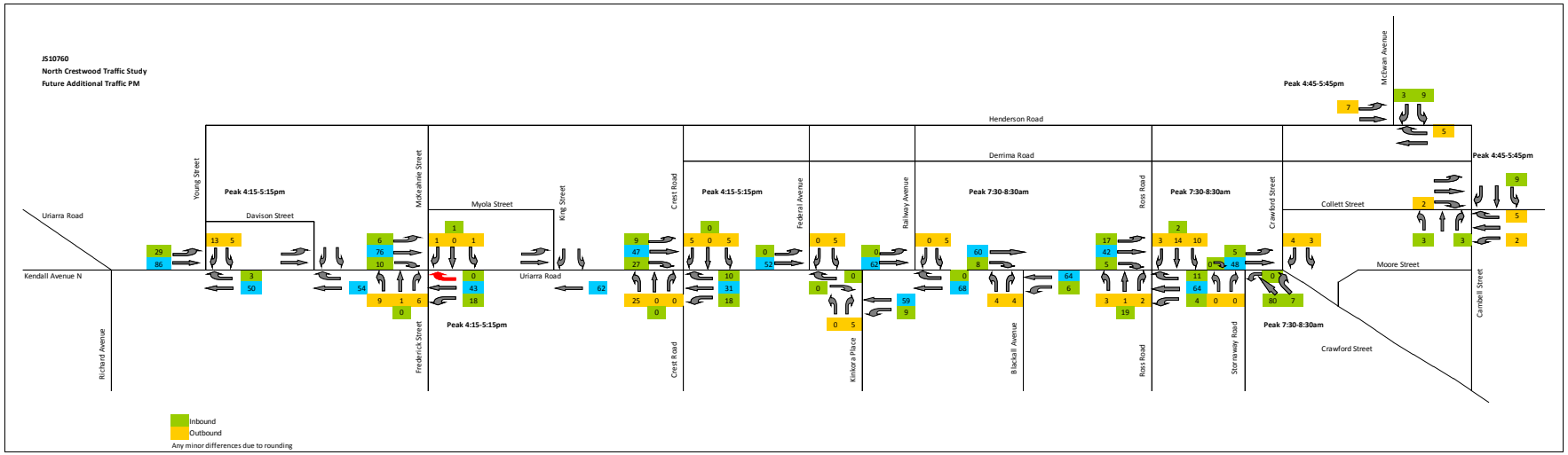


Figure 4.4: Anticipated 2031 Post Development Volumes AM Peak Hour

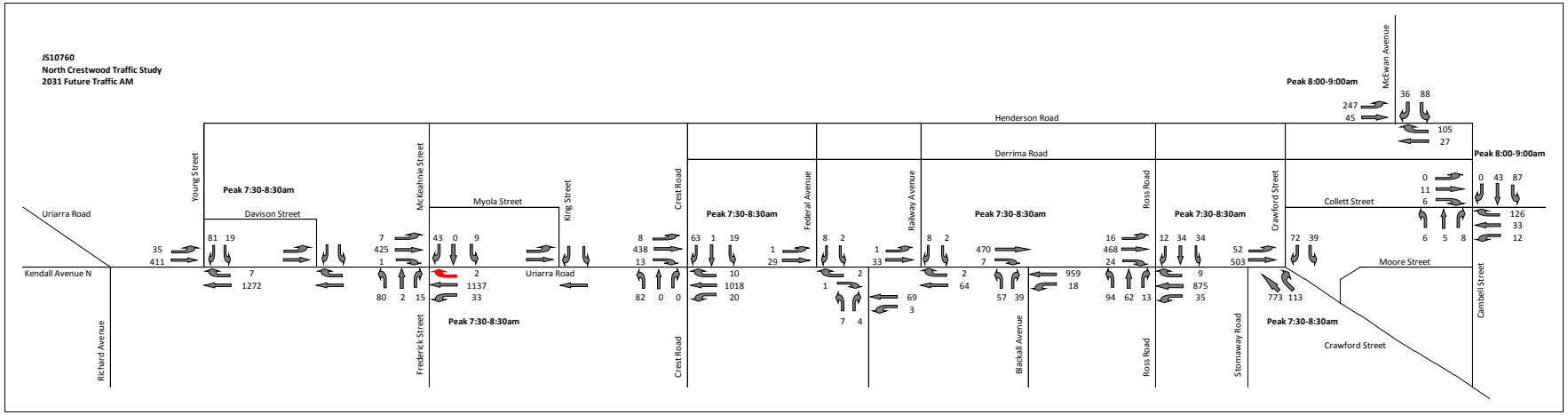
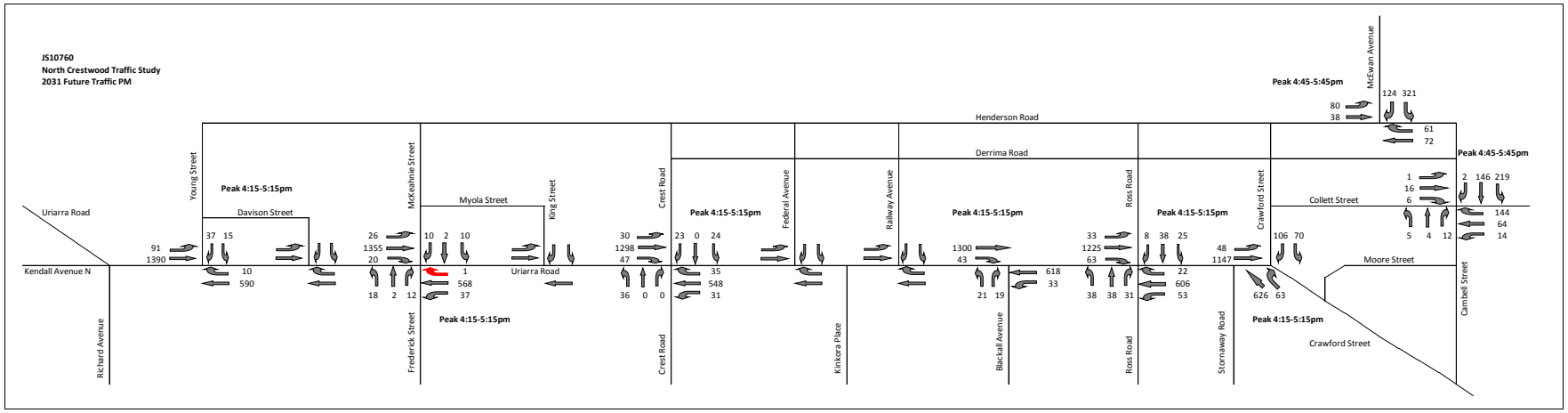


Figure 4.5: Anticipated 2031 Post Development Volumes PM Peak Hour



4.3 Operational Assessment

A summary of the analysis used to determine the future road network operation in 2031 is set out in the following section. Based on the methodology outlined in Section 4, Table 4.5 to Table 4.12 present a summary of the expected future 2031 post development operating conditions assuming no change to the road network. Detailed results are provided in Appendix G.

Table 4.5: Uriarra Road / Young Street Intersection – 2031 Post Development

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Uriarra Road E	0.72	13	23	A
	Young Street (Lane 1 - Left)	0.06	10	0	A
	Young Street (Lane 2 - Right)	1.45	504	21	F
	Uriarra Road W	0.26	1	0	A
	Overall	1.45	32	23	
Thu PM	Uriarra Road E	0.54	177	40	F
	Young Street (Lane 1 - Left)	0.45	136	1	F
	Young Street (Lane 2 - Right)	1.00	233	4	F
	Uriarra Road W	0.79	1	0	A
	Overall	1.00	55	40	

Table 4.5 indicates that in 2031 under a post development scenario, the intersection of Uriarra Road / Young Street is expected to operate unsatisfactorily during the AM and PM peak hours with maximum average delays of 500 seconds during the AM peak hour and 230 seconds during the PM peak hour. This means that either the intersection geometry requires modification or traffic needs to be redistributed to nearby intersections. This is discussed in more detail in Section 6.

Table 4.6: Uriarra Road / Frederick Street / McKeahnie Street Intersection - 2031 Post Development

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Frederick Street (Lane 1 - Left)	0.82	83	25	F
	Frederick Street (Lane 2 – Through / Right)	0.37	93	7	F
	Uriarra Road E	0.66	10	136	A
	McKeahnie Street (Lane 1 - Left)	0.03	10	0	A
	McKeahnie Street (Lane 2 - Through / Right)	0.99	224	34	F
	Uriarra Road W	0.26	34	79	C
	Overall	0.99	25	136	
Thu PM	Frederick Street (Lane 1 - Left)	0.03	12	1	A
	Frederick Street (Lane 2 – Through / Right)	0.74	324	15	F
	Uriarra Road E	0.34	74	184	F
	McKeahnie Street (Lane 1 - Left)	0.20	76	4	F
	McKeahnie Street (Lane 2 - Through / Right)	0.68	321	13	F
	Uriarra Road W	0.76	21	181	B
	Overall	0.76	40	184	

Table 4.6 indicates that in 2031 under a post development scenario, the intersection of Uriarra Road / Frederick Street / McKeahnie Street is expected to operate unsatisfactorily during the AM or PM peak hours with average delays of over 200 seconds during the AM peak hour and 300 seconds during the PM

peak hour for vehicles turning right. This means that either the intersection geometry requires modification or traffic needs to be redistributed to nearby intersections. This is discussed in more detail in Section 6.

Table 4.7: Uriarra Road / Crest Road Intersection - 2031 Post Development

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Crest Road S	0.50	35	13	C
	Uriarra Road E (Lane 1 - Through)	0.58	0	0	A
	Uriarra Road E (Lane 2 - Right)	0.01	10	0	A
	Crest Road N (Lane 1 - Left)	0.03	10	1	A
	Crest Road N (Lane 2 – Right / Through)	1.14	276	69	F
	Uriarra Road W (Lane 1 – Left/Through)	0.26	0	0	A
	Uriarra Road W (Lane 2 - Right)	0.07	21	1	B
	Overall	1.14	13	69	
Thu PM	Crest Road S	0.07	12	2	A
	Uriarra Road E (Lane 1 - Through)	0.32	0	0	A
	Uriarra Road E (Lane 2 - Right)	0.40	57	8	E
	Crest Road N (Lane 1 - Left)	0.43	82	8	F
	Crest Road N (Lane 2 – Right / Through)	1.00	374	29	F
	Uriarra Road W (Lane 1 – Left/Through)	0.72	0	0	A
	Uriarra Road W (Lane 2 - Right)	0.07	11	2	A
	Overall	1.00	7	29	

Table 4.7 indicates that in 2031 under a post development scenario, the intersection of Uriarra Road / Crest Road is expected to operate unsatisfactorily during the AM or PM peak hours with average delays of over 270 seconds and 370 seconds respectively for vehicles turning right. This means that either the intersection geometry requires modification or traffic needs to be redistributed to nearby intersections. This is discussed in more detail in Section 6.

Table 4.8: Uriarra Road / Blackall Avenue Intersection - 2031 Post Development

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Blackall Avenue (Lane 1 - Left)	0.29	25	7	B
	Blackall Avenue (Lane 2 – Right)	0.51	65	11	E
	Uriarra Road E	0.54	0	0	A
	Uriarra Road W (Lane 1 - Through)	0.26	0	0	A
	Uriarra Road W (Lane 2 - Right)	0.04	17	2	B
	Overall	0.54	3	11	
Thu PM	Blackall Avenue (Lane 1 - Left)	0.04	12	1	A
	Blackall Avenue (Lane 2 – Right)	0.69	211	14	F
	Uriarra Road E	0.35	0	0	A
	Uriarra Road W (Lane 1 - Through)	0.66	8	0	A
	Uriarra Road W (Lane 2 - Right)	0.10	1	4	A
	Overall	0.69	3	14	

Table 4.8 indicates that in 2031 under a post development scenario, the intersection of Uriarra Road / Blackall Avenue is expected to operate unsatisfactorily during the AM or PM peak hours with average delays of 65 seconds and 211 seconds respectively for vehicles turning right. It is noted however that

95th percentile queues expected do not exceed 2 vehicles which suggests that if gaps in the traffic stream can be created upstream, this would result in improved intersection operation. This is discussed in more detail in Section 6.

Table 4.9: Uriarra Road / Ross Road Intersection - 2031 Post Development

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Ross Road S (Lane 1 - Left)	0.38	26	10	B
	Ross Road S (Lane 2 – Through / Right)	1.11	264	75	F
	Uriarra Road E (Lane 1 – Left / Through)	0.51	0	0	A
	Uriarra Road E (Lane 2 - Right)	0.01	10	0	A
	Ross Road N (Lane 1 - Left)	0.11	14	1	A
	Ross Road N (Lane 2 – Through / Right)	0.72	111	19	F
	Uriarra Road W (Lane 1 – Left / Through)	0.25	0	0	A
	Uriarra Road W (Lane 2 - Right)	0.07	17	2	B
	Overall	1.11	17	75	
Thu PM	Ross Road S (Lane 1 - Left)	0.08	15	2	B
	Ross Road S (Lane 2 – Through / Right)	1.17	335	94	F
	Uriarra Road E (Lane 1 – Left / Through)	0.35	1	0	A
	Uriarra Road E (Lane 2 - Right)	0.16	33	3	C
	Ross Road N (Lane 1 - Left)	0.28	51	6	D
	Ross Road N (Lane 2 – Through / Right)	1.00	282	42	F
	Uriarra Road W (Lane 1 – Left / Through)	0.67	0	0	A
	Uriarra Road W (Lane 2 - Right)	0.10	12	3	A
	Overall	1.17	18	94	

Table 4.10 indicates that in 2031 under a post development scenario, the intersection of Uriarra Road / Ross Road is expected to operate unsatisfactorily during the AM or PM peak hours with average delays of 100 to 260 seconds and 280 to 330 seconds for right turners respectively. This is discussed in more detail in Section 6.

Table 4.10: Uriarra Road / Crawford Street Intersection - 2031 Post Development

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Crawford Street E (Lane 1 - Through)	0.43	0	0	A
	Crawford Street E (Lane 2 - Right)	0.17	11	5	A
	Crawford Street N (Lane 1 - Left)	0.07	11	2	A
	Crawford Street N (Lane 2 - Right)	0.65	53	16	D
	Uriarra Road W	0.31	1	0	C
	Overall	0.65	4	16	A
Thu PM	Crawford Street E (Lane 1 - Through)	0.33	0	0	A
	Crawford Street E (Lane 2 - Right)	0.36	32	8	C
	Crawford Street N (Lane 1 - Left)	0.55	46	13	D
	Crawford Street N (Lane 2 - Right)	1.79	801	243	F
	Uriarra Road W	0.63	0	0	A
	Overall	1.79	44	243	

Table 4.10 indicates that in 2031 under a post development scenario, the intersection of Uriarra Road / Crawford Street is expected to operate satisfactorily during the AM peak hour however the intersection is not expected to operate satisfactorily during the PM peak hour with average delays of 801 seconds for right turning vehicles. This is discussed in more detail in Section 6.

Table 4.11: Campbell Street / Collett Street Intersection - 2031 Post Development

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Campbell Street S	0.01	6	1	A
	Collett Street E	0.23	8	7	A
	Campbell Street N	0.08	4	3	A
	Collett Street W	0.03	8	1	A
	Overall	0.23	6	7	
Thu PM	Campbell Street S	0.02	7	1	A
	Collett Street E	0.39	11	16	A
	Campbell Street N	0.21	4	9	A
	Collett Street W	0.04	9	1	A
	Overall	0.39	7	16	

Table 4.11 indicates that in 2031 under a post development scenario, the intersection of Campbell Street / Collett Street is expected to operate satisfactorily.

Table 4.12: Henderson Road / McEwan Avenue Intersection - 2031 Post Development

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Henderson Road E	0.13	7	4	A
	McEwan Avenue N	0.17	9	5	A
	Henderson Road W	0.17	5	0	A
	Overall	0.17	7	5	
Thu PM	Henderson Road E	0.09	4	3	A
	McEwan Avenue N	0.53	9	30	A
	Henderson Road W	0.07	4	0	A
	Overall	0.53	7	30	

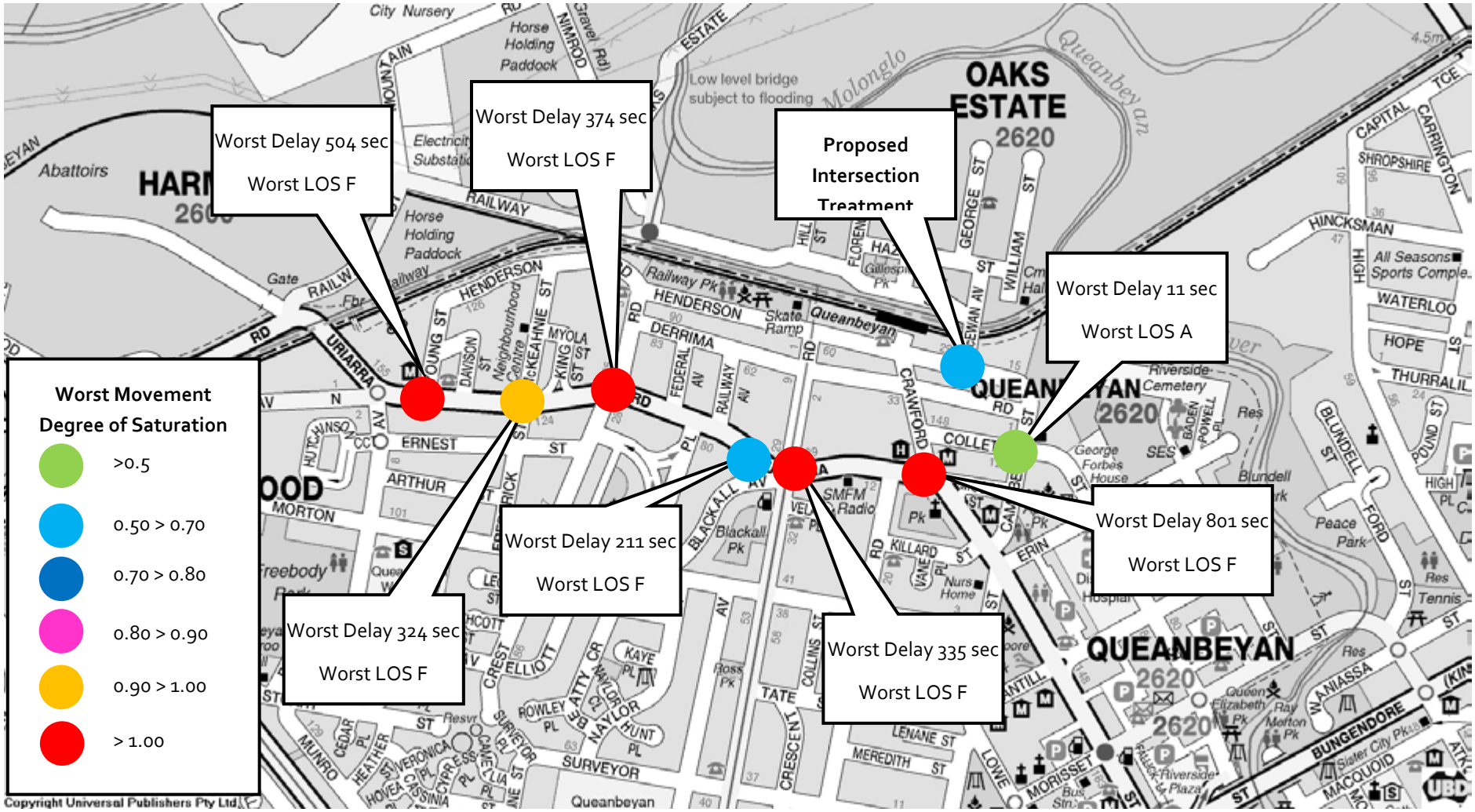
Table 4.12 indicates that in 2031 under a post development scenario, the intersection of Henderson Road / McEwan Avenue is expected to operate satisfactorily.

Based on the results in Table 4.5 to Table 4.12 and assuming no change to the road network or traffic distribution, the intersections which are not expected to function satisfactorily include:

- Uriarra Road / Young Street
- Uriarra Road / Frederick Street / McKeahnie Street
- Uriarra Road / Crest Road
- Uriarra Road / Blackall Avenue
- Uriarra Road / Ross Road
- Uriarra Road / Crawford Street.

This is illustrated in Figure 4.6.

Figure 4.6: Summary of 2031 Post Development Intersection Operation



5. Future Intersection Improvement Options

5.1 Introduction

The design and analysis of potential intersection options has been based on the surveys and observations of existing conditions, analysis of crash data for the last available five-year period, discussions with Council and resident responses highlighting issues within the study area. The design has also been based on the proposed traffic growth and capacity required to provide an improved level of service to the intersections within the study area as well as details regarding recorded crashes.

To determine the options for changes to the road network to support the future development, GTA Consultants has developed and analysed a number of changes to the intersections that are not expected to operate satisfactorily in the future. A summary of the results are set out in the following sections with more detailed results provided in Appendix H. Concept designs for each of the intersections are provided in Appendix I.

5.2 Operational Assessment

The following sections set out a summary of the expected future intersection operation under a range of design options.

5.2.1 Intersection of Uriarra Road / Young Street

Options for future analysis for the intersection of Uriarra Road / Young Street are set out in the following sections.

Roundabout Option

The option of a roundabout has been tested at this intersection with a summary of results provided in Table 5.1. Full results are provided in Appendix H.

Table 5.1: Uriarra Road / Young Street Intersection – 2031 Post Development – Roundabout Treatment

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Uriarra Road E	0.99	14	354	A
	Young Street N	0.13	12	5	A
	Uriarra Road W	0.30	6	20	A
	Overall	0.99	12	354	A
Thu PM	Uriarra Road E	0.42	6	30	A
	Young Street N	0.24	37	12	C
	Uriarra Road W	0.91	6	278	A
	Overall	0.91	7	278	A

Table 5.1 indicates that under a roundabout treatment, the intersection of Uriarra Road / Young Street is expected to operate with level of service A during the AM and PM peak hours. A queue of approximately 350m is expected to result on the eastern approach during the AM peak hour and a 280m queue is expected to occur during the PM peak hour on the western approach. These queues on Uriarra Road are expected to impact on adjacent intersections including the roundabout at the intersection of Uriarra Road / Kendall Avenue North.

A summary of the modelling results for a signalised intersection at Uriarra Road / Young Street is presented in Table 5.2. A concept design of this intersection is presented in Appendix I.

Signalised Option

Table 5.2: Uriarra Road / Young Street Intersection – 2031 Post Development

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Uriarra Road E (Lane 1 - Through)	0.86	2	137	A
	Uriarra Road E (Lane 2 -Right)	0.03	10	1	A
	Young Street (Lane 1 - Left)	0.26	64	8	E
	Young Street (Lane 2 - Right)	0.86	73	37	F
	Uriarra Road W	0.31	3	41	A
	Overall	0.86	6	137	A
Thu PM	Uriarra Road E (Lane 1 - Through)	0.37	2	54	A
	Uriarra Road E (Lane 2 -Right)	0.14	42	3	C
	Young Street (Lane 1 - Left)	0.61	76	7	F
	Young Street (Lane 2 - Right)	0.44	77	18	F
	Uriarra Road W	0.92	9	462	A
	Overall	0.92	9	462	A

Table 5.2 indicates that the intersection is expected to operate with an overall level of service A for both the AM and PM peak hours. The worst movement is expected to operate with level of service F and 460m queues are expected to result on the western approach during the PM peak hour. These queues on Uriarra Road, particularly during the PM peak hour are expected to impact on adjacent intersections including the roundabout at the intersection of Uriarra Road / Kendall Avenue North.

5.2.2 Intersection of Uriarra Road / Frederick Street / McKeahnie Street

Options for future analysis for the intersection of Uriarra Road / Young Street are set out in the following sections.

Roundabout Option

The option of a roundabout has been tested at this intersection with a summary of results provided in Table 5.3. Full results are provided in Appendix H.

Table 5.3: Uriarra Road / Frederick Street / McKeahnie Street - 2031 Post Development - Roundabout

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Frederick Street	0.40	29	22	C
	Uriarra Road E	0.84	7	139	A
	McKeahnie Street	0.07	12	3	A
	Uriarra Road W	0.31	6	20	A
	Overall	0.84	8	139	A
Thu PM	Frederick Street	0.04	11	2	A
	Uriarra Road E	0.41	6	26	A
	McKeahnie Street	0.10	34	5	C
	Uriarra Road W	0.87	6	214	A
	Overall	0.87	7	214	A

Table 5.3 indicates that with under roundabout control, the intersection is expected to operate with an overall level of service A during both the AM and PM peak hours. The worst movement is expected to operate with a level of service C during the AM and PM peak hours. A maximum queue of approximately 200m is expected on Uriarra Road (west approach) during the PM peak hour.

Signalised Option

The option of a signalised intersection has been tested at this intersection with a summary of results provided in Table 5.4. Full results are provided in Appendix H.

Table 5.4: Uriarra Rd / Frederick St / McKeahnie St - 2031 Post Development – Signalised Option

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Frederick Street (Lane 1 - Left)	0.78	64	33	E
	Frederick Street (Lane 2 - Through / Right)	0.20	58	6	E
	Uriarra Road E (Lane 1 - Left / Through)	0.80	2	93	A
	Uriarra Road E (Lane 2 - Right)	0.01	11	0	A
	McKeahnie Street (Lane 1 - Left)	0.11	58	3	E
	McKeahnie Street (Lane 2 - Through / Right)	0.60	64	18	E
	Uriarra Road W (Lane 1 - Left / Through)	0.31	2	40	A
	Uriarra Road W (Lane 2 - Right)	0.01	23	0	B
	Overall	0.80	7	93	A
Thu PM	Frederick Street (Lane 1 - Left)	0.20	70	8	E
	Frederick Street (Lane 2 - Through / Right)	0.19	69	6	E
	Uriarra Road E (Lane 1 - Left / Through)	0.38	3	56	A
	Uriarra Road E (Lane 2 - Right)	0.02	30	0	C
	McKeahnie Street (Lane 1 - Left)	0.13	69	4	E
	McKeahnie Street (Lane 2 - Through / Right)	0.14	68	5	E
	Uriarra Road W (Lane 1 - Left / Through)	0.86	2	164	A
	Uriarra Road W (Lane 2 - Right)	0.08	11	2	A
	Overall	0.86	4	164	A

Table 5.4 indicates that a signalised intersection of Uriarra Road / Frederick Street / McKeahnie Street is expected to operate with an overall level of service A during both the AM and PM peak hours. The worst movement is expected to operate with a level of service E. A maximum queue of approximately

160m is expected during the PM peak hour on the western approach. This is approximately 20m beyond the intersection with Davidson Street.

5.2.3 Intersection of Uriarra Road / Crest Road

Options for future analysis for the intersection of Uriarra Road / Crest Road are set out in the following sections.

Roundabout Option

The option of a signalised intersection has been tested at this location with a summary of results provided in Table 5.5. Full results are provided in Appendix H.

Table 5.5: Uriarra Road / Crest Road Intersection - 2031 Post Development – Signalised

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Crest Road S (Lane 1 – Left)	0.55	43	22	D
	Uriarra Road E (Lane 1 – Left / Through)	0.78	2	57	A
	Uriarra Road E (Lane 2 - Right)	0.03	12	1	A
	Crest Road N (Lane 1 - Left)	0.15	41	5	C
	Crest Road N (Lane 2 – Right / Through)	0.60	46	18	D
	Uriarra Road W (Lane 1 – Left/Through)	0.34	4	41	A
	Uriarra Road W (Lane 2 - Right)	0.12	23	3	B
	Overall	0.78	7	57	A
Thu PM	Crest Road S (Lane 1 – Left)	0.34	59	13	E
	Uriarra Road E (Lane 1 – Left / Through)	0.39	3	55	A
	Uriarra Road E (Lane 2 - Right)	0.40	37	10	C
	Crest Road N (Lane 1 - Left)	0.26	59	9	E
	Crest Road N (Lane 2 – Right / Through)	0.27	59	9	E
	Uriarra Road W (Lane 1 – Left/Through)	0.88	5	172	A
	Uriarra Road W (Lane 2 - Right)	0.18	12	5	A
	Overall	0.88	7	172	A

Table 5.5 indicates that in 2031 under a post development scenario, the intersection of Uriarra Road / Crest Road is expected to operate more efficiently than a roundabout configuration. The longest queue expected is approximately 170m which would extend to between King Street and McKeahnie Street.

Signalised Option

The option of a roundabout has been tested at this intersection with a summary of results provided in Table 5.6. Full results are provided in Appendix H.

Table 5.6: Uriarra Road / Crest Road Intersection - 2031 Post Development - Roundabout

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Crest Road S	0.28	20	15	B
	Uriarra Road E	0.80	8	101	A
	Crest Road N	0.11	12	4	A
	Uriarra Road W	0.31	6	20	A
	Overall	0.80	8	101	A
Thu PM	Crest Road S	0.05	10	2	A
	Uriarra Road E	0.47	7	31	A
	Crest Road N	0.30	34	16	C
	Uriarra Road W	0.92	7	262	A
	Overall	0.92	8	262	A

Table 5.6 indicates that in 2031 under a post development scenario, the intersection of Uriarra Road / Crest Road is expected to operate with an average level of service A during both the AM and PM peak hours. The worst movement is expected to operate with a level of service C. The longest queue is expected to result during the PM peak hour where a queue of approximately 260m is expected which would extend past the intersection with McKeahnie Street.

5.2.4 Uriarra Road / Ross Road

Roundabout Option

Table 5.7: Uriarra Road / Ross Road Intersection - 2031 Post Development – Roundabout

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Ross Road S	0.39	17	21	B
	Uriarra Road E	0.70	7	69	A
	Ross Road N	0.11	10	5	A
	Uriarra Road W	0.43	7	29	A
	Overall	0.70	8	69	A
Thu PM	Ross Road S	0.16	11	7	A
	Uriarra Road E	0.54	7	39	A
	Ross Road N	0.43	38	25	C
	Uriarra Road W	0.98	12	293	A
	Overall	0.98	11	293	A

Table 5.7 indicates that in 2031 under a post development scenario, the intersection of Uriarra Road / Ross road is expected to operate overall with a level of service A during both the AM and PM peak hours. Queues of up to 300m are expected which would extend to the intersection of Uriarra Road / Federal Avenue and impact the operation of Federal Avenue, Kinkora Place and Railway Avenue.

Signalised Option

Table 5.8: Uriarra Road / Ross Road Intersection - 2031 Post Development – Signalised Option

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Ross Road S (Lane 1 - Left)	0.67	38	22	C
	Ross Road S (Lane 2 – Through / Right)	0.44	31	17	C
	Uriarra Road E (Lane 1 – Left / Through)	0.73	2	47	A
	Uriarra Road E (Lane 2 - Right)	0.03	13	1	A
	Ross Road N (Lane 1 - Left)	0.24	36	7	C
	Ross Road N (Lane 2 – Through / Right)	0.31	31	10	C
	Uriarra Road W (Lane 1 – Left / Through)	0.40	4	47	A
	Uriarra Road W (Lane 2 - Right)	0.14	21	4	B
	Overall	0.73	8	47	A
Thu PM	Ross Road S (Lane 1 - Left)	0.44	59	14	E
	Ross Road S (Lane 2 – Through / Right)	0.74	60	27	E
	Uriarra Road E (Lane 1 – Left / Through)	0.43	3	64	A
	Uriarra Road E (Lane 2 - Right)	0.25	27	5	B
	Ross Road N (Lane 1 - Left)	0.28	59	9	E
	Ross Road N (Lane 2 – Through / Right)	0.45	54	17	D
	Uriarra Road W (Lane 1 – Left / Through)	0.82	2	101	A
	Uriarra Road W (Lane 2 - Right)	0.16	12	7	A
	Overall	0.82	8	101	A

Table 5.8 indicates that in 2031 under a post development scenario, the intersection of Uriarra Road / Ross Road is expected to operate overall with a level of service A during both the AM and PM peak hours. Queues of up to 100m on Uriarra Road are expected during the PM peak hour which is considered acceptable.

5.2.5 Uriarra Road / Crawford Street

Signalised Option

Table 5.9: Uriarra Road / Crawford Street Intersection - 2031 Post Development – Signalised Option

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Crawford Street E (Lane 1 - Through)	0.55	4	89	A
	Crawford Street E (Lane 2 - Right)	0.32	13	13	A
	Crawford Street N (Lane 1 - Left)	0.36	48	12	D
	Crawford Street N (Lane 2 - Right)	0.55	49	22	D
	Uriarra Road W	0.41	4	55	A
	Overall	0.55	8	89	A
Thu PM	Crawford Street E (Lane 1 - Through)	0.43	3	59	A
	Crawford Street E (Lane 2 - Right)	0.52	30	15	C
	Crawford Street N (Lane 1 - Left)	0.61	49	21	D
	Crawford Street N (Lane 2 - Right)	0.78	52	33	D
	Uriarra Road W	0.81	2	81	A
	Overall	0.81	8	81	A

Table 5.9 indicates that in 2031 under a post development scenario, the intersection of Uriarra Road / Crawford Street is expected to operate well with overall level of service A during both the AM and PM peak hours. Crawford Street is expected to operate with a level of service D.

The following section sets out a number of options for the study area based on the potential treatment options for the individual intersections within the study area.

No Right Turn Option

In this option, the right turn from Crawford Street to Uriarra Road has been banned.

Table 5.10: Uriarra Road / Crawford Street Intersection - 2031 Post Development – No Right Turn Option

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Crawford Street E (Lane 1 - Through)	0.43	0	0	A
	Crawford Street E (Lane 2 - Right)	0.17	11	5	A
	Crawford Street N (Lane 1 - Left)	0.07	11	2	A
	Uriarra Road W	0.31	1	0	A
	Overall	0.43	1	5	
Thu PM	Crawford Street E (Lane 1 - Through)	0.33	0	0	A
	Crawford Street E (Lane 2 - Right)	0.35	32	8	C
	Crawford Street N (Lane 1 - Left)	0.55	46	13	D
	Uriarra Road W	0.63	0	0	A
	Overall	0.63	3	13	

Table 5.10 indicates that under an option where the right turn from Crawford Street to Uriarra Road is banned, the intersection is expected to operate with acceptable degrees of saturation and delays on all approaches. The worst movement has a level of service D.

As a result of the right turn from Crawford Street to Uriarra Road being banned, it is assumed that the vehicles that currently turn right at this intersection will turn right at the intersection of Uriarra Road /

Ross Road. Under this scenario, Table 5.11 presents a summary of the operation with additional right turn volumes.

Signalised Option with Additional Right Turns

Table 5.11: Uriarra Rd / Ross Rd- 2031 Post Development – Signalised Option – Additional Right Turns

Peak	Leg (Lane)	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Thu AM	Ross Road S (Lane 1 - Left)	0.91	31	33	C
	Ross Road S (Lane 2 – Through / Right)	0.04	28	2	B
	Uriarra Road E (Lane 1 – Left / Through)	0.91	20	221	B
	Uriarra Road E (Lane 2 - Right)	0.04	20	1	B
	Ross Road N (Lane 1 - Left)	0.40	24	12	B
	Ross Road N (Lane 2 – Through / Right)	0.34	33	17	C
	Uriarra Road W (Lane 1 – Left / Through)	0.49	9	69	A
	Uriarra Road W (Lane 2 - Right)	0.18	36	5	C
	Overall	0.91	19	221	B
Thu PM	Ross Road S (Lane 1 - Left)	0.80	56	28	D
	Ross Road S (Lane 2 – Through / Right)	0.22	56	11	D
	Uriarra Road E (Lane 1 – Left / Through)	0.46	5	82	A
	Uriarra Road E (Lane 2 - Right)	0.26	39	6	C
	Ross Road N (Lane 1 - Left)	0.66	50	22	D
	Ross Road N (Lane 2 – Through / Right)	0.87	67	46	E
	Uriarra Road W (Lane 1 – Left / Through)	0.87	5	149	A
	Uriarra Road W (Lane 2 - Right)	0.17	15	9	B
	Overall	0.87	12	149	A

Table 5.11 indicates that in 2031 under a post development scenario, the intersection of Uriarra Road / Ross Road, the intersection is expected to operate with an overall level of service B during the AM peak hour and level of service A during the PM peak hour.

6. Study Area Options

6.1 Introduction and Purpose

The following sections set out three proposed options for improvement to the study area which could cater for anticipated future development traffic. As previously discussed, the options have been development taking into account the surveys and observations of existing conditions, analysis of crash data for the last available five-year period, discussions with Council and resident responses highlighting issues within the study area.

6.2 Study Area Option 1

Figure 6.1 presents a summary of the proposed intersection treatment options within the study area under Option 1. The intent of this option is to treat every location where crash history or intersection operation is currently expected to be unsatisfactory in the future. This option represents the most expensive option however is expected to produce the best result for the study are in terms of pedestrian connectivity, operation and safety. If this option is selected by Council as the preferred option or a variation, more detailed design and investigation would be required at proposed treatment locations.

Figure 6.1: Study Area Future Option 1

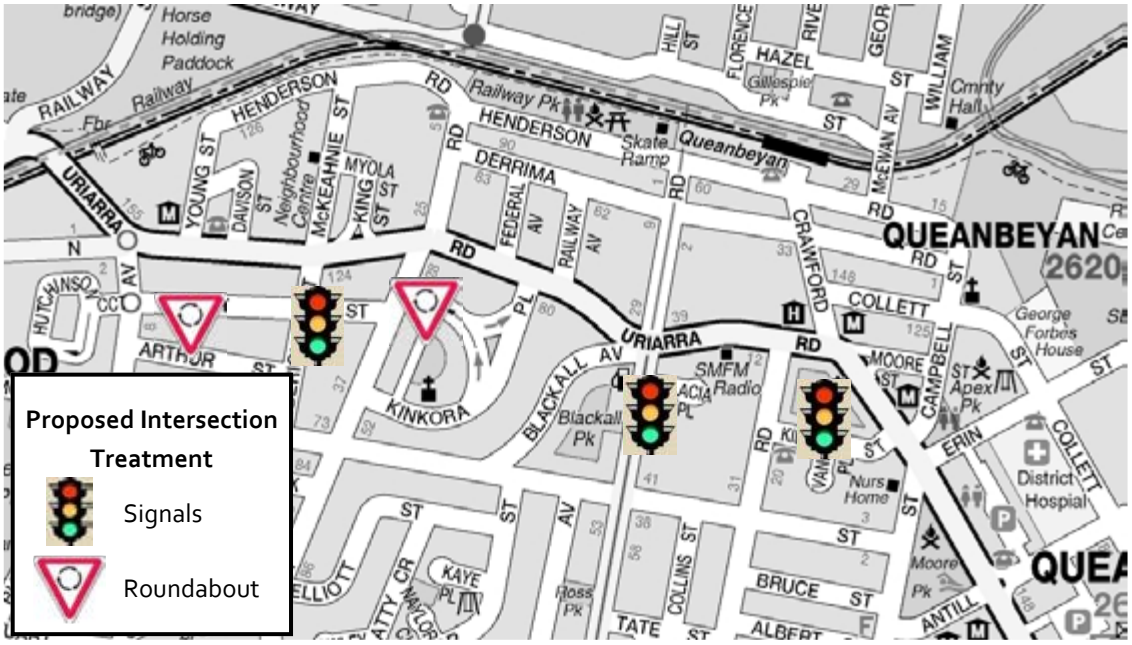


Figure 6.1 indicates that signals are proposed at the following intersections:

- Uriarra Road / McKeahnie Street
- Uriarra Road / Ross Road
- Uriarra Road / Crawford Street.

Roundabouts are proposed at the following intersections:

- Uriarra Road / Young Street
- Uriarra Road / Crest Road.

A summary of the reasoning, advantages and disadvantages of this option are provided in Table 6.1. Concept designs of all proposed treatments are provided in Appendix I.

Table 6.1: Summary of Study Area Future Option 1

Intersection	Proposed Treatment	Reasoning	Advantages	Disadvantages
Uriarra Road / Young Street	Roundabout	If there is no change to the road network under 2031 post development conditions, the intersection is expected to operate with a degree of saturation of 1.45 and an average delay of 504 seconds for vehicles exiting Young Street. Construction of a roundabout at this location will provide an opportunity for vehicles to exit Young Street and under this configuration the overall intersection degree of saturation reduces to 0.99 with maximum average delays of 37 seconds on Young Street.	• Improved intersection operation and reduced delays. • Reduced average delays and degrees of saturation. • A roundabout forces vehicles to slow down on Uriarra Road.	• Increased queuing on Uriarra Road as a result of unbalanced flows at the intersection. • The queuing on Uriarra Road is expected to extend past the intersection with King Street and as such, it is recommended that the pedestrian zebra crossing be removed. A replacement pedestrian crossing treatment could be incorporated into the roundabout design at the intersection. • Roundabouts can provide hazards for cyclists and can be difficult to cross for pedestrians without pedestrian zebra crossings installed.
Uriarra Road / McKeahnie Street / Frederick Street	Signals and removal of pedestrian refuge near King Street.	If there is no change to the road network under 2031 post development conditions, intersection degree of saturation is expected to reach 0.99 with up to 300 second average delays on McKeahnie Street and Frederick Street. Introduction of signals is expected to result in lower average delays and an intersection degree of saturation of 0.86. Crash history shows 5 crashes in the last 5 years with 3 injury crashes. There were 4 crashes involving turning vehicles at this intersection.	• Improved intersection operation and reduced delays. • Incorporation of signalised pedestrian crossing and removal of pedestrian refuge near the intersection with King Street which has had 3 crashes in the last 5 years (including 1 pedestrian crash). • Reduces potential for cross-traffic crashes. • Links up with the medium priority bicycle route on Frederick Street and provides the ability to continue north with an improved crossing of Uriarra Road.	• Higher queues on Uriarra Road than the expected future operation with no intersection treatment. • Costly to install signals at a new location as well as ongoing maintenance costs.
Uriarra Road / Crest Road	Roundabout	If there is no change to the road network under 2031 post development conditions, intersection degree of saturation is expected to increase to 1.14 with average delays of over 350 seconds during the PM peak hour. Crash history shows 5 crashes in the last available 5-year period (1 resulting in injury). A roundabout will slow vehicles down which may improve the safety of the intersection	• Improved intersection operation and reduced delays. • All vehicles have to slow to negotiate the intersection. • All movements are now possible at this intersection as sight distance constraints are removed. • Turns from Blackall Avenue should be improved with the introduction of a 'keep clear' section on Uriarra Road.	• Irregular intersection geometry produces a non-standard roundabout. • Current design is for up to 12.5m long vehicles and more detailed design is required to test whether longer vehicles can negotiate this intersection. • Roundabouts can provide hazards for cyclists and can be difficult to cross for pedestrians without pedestrian zebra crossings installed.

Table 6.2: Summary of Study Area Future Option 1

Intersection	Proposed Treatment	Reasoning	Advantages	Disadvantages
Uriarra Road / Ross Road	Signals	If there is no change to the road network under 2031 post development conditions, intersection degree of saturation is expected to reach 1.17 with average delays of over 300 seconds during the PM peak hour. Signals at this location are expected to reduce the degree of saturation to 0.82 with maximum average delays of approximately 60 seconds. Crash history at this intersection shows 4 recent crashes including 4 cross-traffic crashes (1 injury crash).	• Improved intersection operation and reduced delays. • Incorporation of signalised pedestrian crossings on all legs will provide improved crossing of Uriarra Road and the design integrates with the medium priority pedestrian route on Ross Road (south). • Signals should improve vehicle movements and reduce cross-traffic crashes.	• Longer queues on Uriarra Road than with no intersection treatment. • Costly to install signals at a new location as well as ongoing maintenance costs.
Uriarra Road / Crawford Street	Signals	If there is no change to the road network under 2031 post development conditions, intersection degree of saturation is expected to reach 1.79 with average delays of approximately 800 seconds. Introduction of signals at this location is expected to reduce the intersection degree of saturation to 0.81 with maximum average delays of 52 seconds (level of service D). Recent crash history shows 2 injury crashes involving vehicles turning right and one pedestrian fatality.	• Improved intersection operation and reduced delays. • Incorporation of pedestrian crossing on all approaches will provide improved pedestrian crossing of Uriarra Road / Crawford Street. • This location is consistent with 'High Priority' pedestrian routes identified in the Queanbeyan Pedestrian and Mobility Plan as well as 'High Priority' bicycle routes identified in the Queanbeyan Bicycle Plan.	• Longer queues on Uriarra Road than with no intersection treatment. • Costly to install signals at a new location as well as ongoing maintenance costs.
Various	Pedestrian Refuges	There are no warrants to be met for the installation of a pedestrian refuge. If installed at selected locations, they would provide a safer method for pedestrians to cross Uriarra Road. It is recommended that potential locations be investigated after the selection of the preferred option for the study area.		
	Bicycle Priority Treatments	It is recommended that potential treatments be investigated after selection of the preferred option for the study area.		

6.3 Study Area Option 2

Figure 6.2 presents a summary of the intersection treatment options within the study area under Option 2. The purpose of this treatment option is to provide a lower cost option should the number of intersection treatments proposed in Option 1 be considered too costly by Council or too intrusive by the local community. This option attempts to balance cost with treatment of problem crash locations. Not all intersections that are expected to operate unsatisfactorily in the future have been treated. In this regard, it is expected that gaps will be created in the traffic along Uriarra Road which will provide greater opportunities for vehicles to exit side streets. Should this option, or a variation, be considered the most suitable by Council, it is recommended that the scenario be tested with a micro-simulation model to ensure that the access strategy can be adequately demonstrated to the community.

Figure 6.2: Study Area Future Option 2

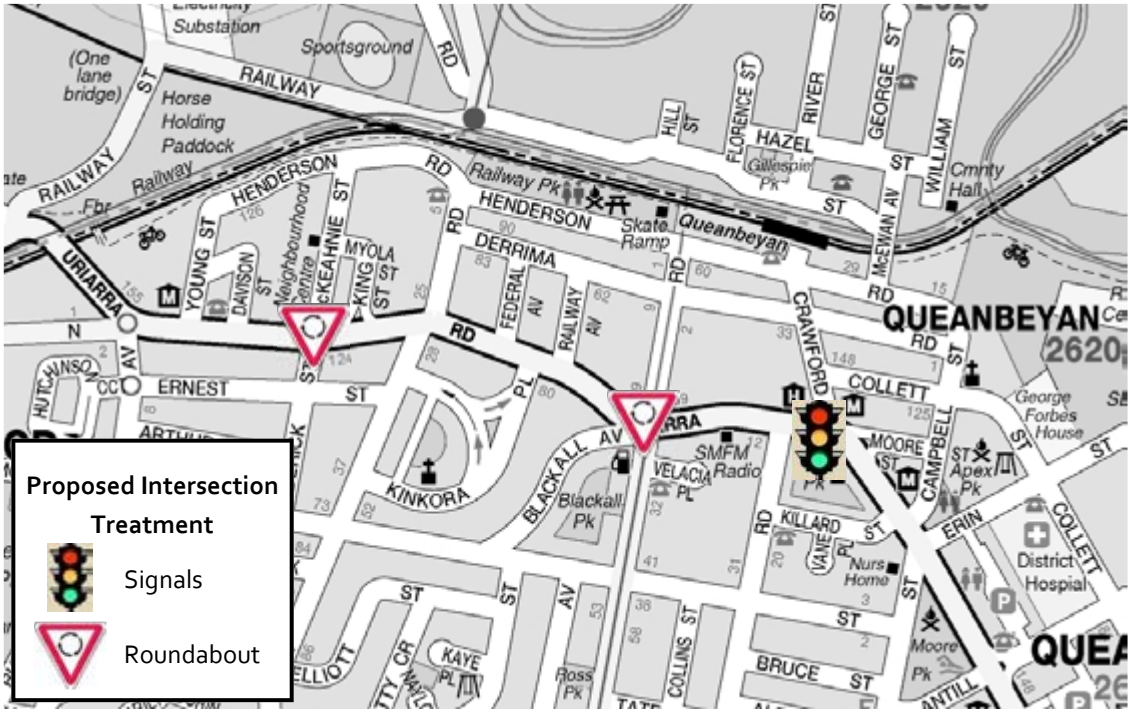


Figure 6.2 indicates that signals are proposed at the intersection of Uriarra Road / Crawford Street.

Roundabouts are proposed at the following intersections:

- Uriarra Road / McKeahnie Street / Frederick Street
- Uriarra Road / Ross Road.

A summary of the reasoning, advantages and disadvantages of this option are provided in Table 6.3. Concept designs of all proposed treatments are provided in Appendix I.

Table 6.3: Summary of Study Area Future Option 2

Intersection	Proposed Treatment	Reasoning	Advantages	Disadvantages
Uriarra Road / McKeahnie Street / Frederick Street	Roundabout	If there is no change to the road network under 2031 post development conditions, intersection degree of saturation is expected to reach 0.99 with up to 300 second delays on McKeahnie Street and Frederick Street. Introduction of a roundabout is expected to result in lower average delays and an intersection degree of saturation of 0.87. Crash history shows 5 crashes in the last 5 years with 3 injury crashes. There were 4 crashes involving turning vehicles at this intersection.	• Improved intersection operation and reduced delays. • Removal of pedestrian refuge near the intersection with King Street which has had 3 crashes in the last 5 years. • Links up with the medium priority bicycle route on Frederick Street and provides the ability to continue north with an improved crossing of Uriarra Road.	• Longer queues on Uriarra than the expected future operation with no intersection treatment. • Roundabouts can provide hazards for cyclists and can be difficult to cross for pedestrians without pedestrian zebra crossings installed.
Uriarra Road / Ross Road	Roundabout	If there is no change to the road network under 2031 post development conditions, intersection degree of saturation is expected to reach 1.17 with average delays of over 300 seconds during the PM peak hour. A roundabout at this location is expected to reduce the degree of saturation to 0.98 with maximum average delays of approximately 38 seconds (level of service C). Crash history at this intersection shows 4 recent crashes including 4 cross-traffic crashes (1 injury crash).	• Improved intersection operation and reduced delays. • Incorporation of pedestrian crossings on all legs will provide improved crossing of Uriarra Road and the design integrates with the medium priority pedestrian route on Ross Road (south). • Improved vehicle movements and reduced potential for cross-traffic crashes.	• Longer queues on Uriarra Road than with no intersection treatment. • Roundabouts can provide hazards for cyclists and can be difficult to cross for pedestrians without pedestrian zebra crossings installed.
Uriarra Road / Crawford Street	Signals	If there is no change to the road network under 2031 post development conditions, intersection degree of saturation is expected to reach 1.79 with average delays of approximately 800 seconds. Introduction of signals at this location is expected to reduce the intersection degree of saturation to 0.81 with maximum average delays of 52 seconds (level of service D). Recent crash history shows 2 injury crashes involving vehicles turning right and one pedestrian fatality.	• Improved intersection operation and reduced delays. • Incorporation of pedestrian crossing on all approaches will provide improved pedestrian crossing of Uriarra Road / Crawford Street. • This location is consistent with 'High Priority' pedestrian routes identified in the Queanbeyan Pedestrian and Mobility Plan as well as 'High Priority' bicycle routes identified in the Queanbeyan Bicycle Plan.	• Longer queues on Uriarra Road than with no intersection treatment. • Costly to install signals at a new location as well as ongoing maintenance costs.
Various	Pedestrian Refuges	There are no warrants to be met for the installation of a pedestrian refuge. If installed at selected locations, they would provide a safer method for pedestrians to cross Uriarra Road. It is recommended that potential locations be investigated after the selection of the preferred option for the study area.		
	Bicycle Priority Treatments	It is recommended that potential treatments be investigated after selection of the preferred option for the study area.		

6.4 Study Area Option 3

Figure 6.3 presents a summary of the intersection treatment options within the study area under Option 3. The purpose of this option is to break the study area into thirds and provide an opportunity for all roads within the study area to turn right while at the same time treating the most common crash locations. The two cross-intersections have been treated along with the intersection of Uriarra Road / Crawford Street where the right turn from Crawford Street has been banned.

Figure 6.3: Study Area Future Option 3

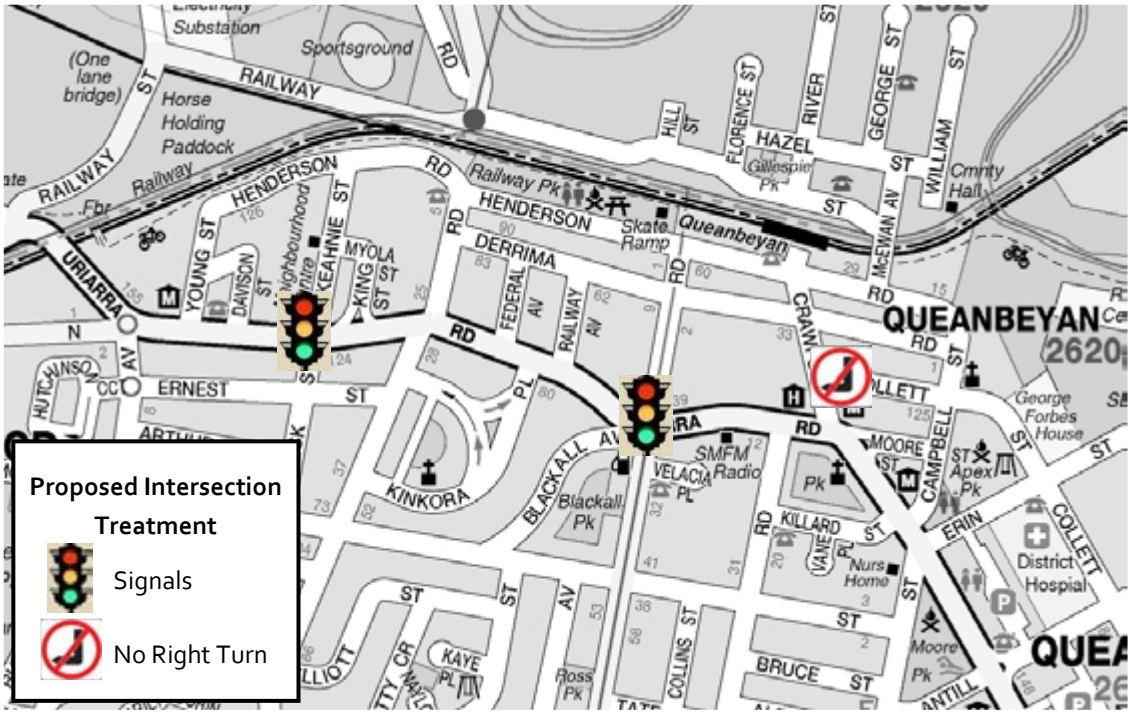


Figure 6.3 indicates that signals are proposed at the intersection of Uriarra Road / Crawford Street and Uriarra Road / McKeahnie Street / Frederick Street.

The only change proposed at the intersection of Uriarra Road / Crawford Street is banning the right turn from Crawford Street into Uriarra Road. This would result in vehicles currently turning right at this intersection, proceeding to most likely, the intersection of Uriarra Road / Ross Road. There is adequate capacity at this intersection to cater for these additional movements.

A summary of this study area option is provided in Table 6.4. Concept designs of all proposed treatments are provided in Appendix I.

Table 6.4: Summary of Study Area Future Option 3

Intersection	Proposed Treatment	Reasoning	Advantages	Disadvantages
Uriarra Road / McKeahnie Street / Frederick Street	Signals and removal of pedestrian refuge near King Street.	If there is no change to the road network under 2031 post development conditions, intersection degree of saturation is expected to reach 0.99 with up to 300 second delays on McKeahnie Street and Frederick Street. Introduction of signals is expected to result in lower average delays and an intersection degree of saturation of 0.86. Crash history shows 5 crashes in the last 5 years with 3 injury crashes. There were 4 crashes involving turning vehicles at this intersection.	• Improved intersection operation and reduced delays. • Incorporation of signalised pedestrian crossing and removal of pedestrian refuge near the intersection with King Street which has had 3 crashes in the last 5 years (including 1 pedestrian crash). • Reduces potential for cross-traffic crashes. • Links up with the medium priority bicycle route on Frederick Street and provides the ability to continue north with an improved crossing of Uriarra Road.	• Higher queues on Uriarra Road than the expected future operation with no intersection treatment. • Costly to install signals at a new location as well as ongoing maintenance costs.
Uriarra Road / Ross Road	Signals	If there is no change to the road network under 2031 post development conditions, intersection degree of saturation is expected to reach 1.17 with average delays of over 300 seconds during the PM peak hour. A roundabout at this location is expected to reduce the degree of saturation to 0.98 with maximum average delays of approximately 38 seconds (level of service C). Crash history at this intersection shows 4 recent crashes including 4 cross-traffic crashes (1 injury crash).	• Improved intersection operation and reduced delays. • Incorporation of pedestrian crossings on all legs will provide improved crossing of Uriarra Road and the design integrates with the medium priority pedestrian route on Ross Road (south). • Signals should improve vehicle movements and reduce cross-traffic crashes.	• Longer queues on Uriarra Road than with no intersection treatment. • Costly to install signals at a new location as well as ongoing maintenance costs.
Uriarra Road / Crawford Street	Ban of Right Turn from Crawford Street into Uriarra Road.	If there is no change to the road network under 2031 post development conditions, intersection degree of saturation is expected to reach 1.79 with average delays of approximately 800 seconds. Introduction of signals at this location is expected to reduce the intersection degree of saturation to 0.81 with maximum average delays of 52 seconds (level of service D). Recent crash history shows 2 injury crashes involving vehicles turning right and one pedestrian fatality. Reducing the number of movements at this intersection is expected to its safety.	• Improved intersection operation and reduced delays. • Reduction of vehicles from this intersection is to improve safety for pedestrians crossing at this location. This can be incorporated with pedestrian refuges to all approaches.	• Crossing of Uriarra Road at this location is not as safe as a controlled situation. • Vehicles do not have to slow or stop when compared to other intersection treatments.
Various	Pedestrian Refuges	There are no warrants to be met for the installation of a pedestrian refuge. If installed at selected locations, they would provide a safer method for pedestrians to cross Uriarra Road. It is recommended that potential locations be investigated after the selection of the preferred option for the study area.		
	Bicycle Priority Treatments	It is recommended that potential treatments be investigated after selection of the preferred option for the study area.		

6.5 Summary Assessment of Options

Based on the options presented above, Table 6.5 provides an assessment of each of the options against a range of criteria.

Table 6.5: Assessment of the Options

Option	Pedestrian Crossing of Uriarra Road	Cyclist Amenity	Total Turn Capacity	Treatment of Crash Locations	Slowing of Vehicles on Uriarra Road	Cost Implications	Total Score
Option 1	✓✓✓	✓	✓✓	✓✓✓	✓✓✓	X X X X	+8
Option 2	✓	✓	✓	✓✓	✓	X X	+4
Option 3	✓✓	✓✓	✓	✓	✓✓	X X	+6

✓ - Good outcome, ✓✓– Very Good Outcome, ✓✓✓– Excellent Outcome

X - Poor Outcome, XX - Very Poor Outcome, X X XX - Extremely Poor Outcome

Table 6.5 indicates that all options are expected to provide an improvement to the study area. Option 1 is expected to provide the best overall outcome for the study area.

However, GTA Consultants' preferred option is Option 3 which provides the right balance between pedestrian and cycle amenity, crash mitigation, traffic capacity and cost. It is therefore recommended that this option be adopted for North Crestwood.

6.6 Preferred Option Rationale

Based on the options presented above, GTA Consultants' preferred option is Option 3. The reasons are as follows:

- Although Option 1 is expected to provide the best overall outcome for the study area, the cost was considered too prohibitive and not appropriate for the study area.
- The option treats the three most common crash locations, two of which are cross-intersections.
- The option treats the three intersections identified as problem locations by local residents. It is noted that the intersection of Uriarra Road / Crest Road was also identified as a problem intersection however it is considered that if gaps can be created in traffic along Uriarra Road then this will improve the operation of this intersection without the need for treatment at this location.
- The option provides two signalised crossing locations improving the north-south connection across Uriarra Road.
- Providing two signalised intersections will create gaps in the traffic stream improving the ability for pedestrians to cross Uriarra Road in other locations and for vehicles to turn onto Uriarra Road at other intersections throughout the study area.
- The treatment locations provide the opportunity to integrate bicycle priority treatments which should be investigated at the detail design stage of the project.
- Pedestrian refuge locations could also be located on Uriarra Road either midblock or preferably at intersections which would also act to slow vehicles through the intersections. It is recommended that these be investigated in more detail at a later stage.

- There is no change to the road network or direction of roads under this option.

7. Conclusions and Recommendations

Based on the investigations undertaken throughout this study, the following conclusions and recommendations can be made:

- Community responses suggest that the intersections of Uriarra Road / Ross Road, Uriarra Road / Crest Road and Uriarra Road / Crawford Street are the most problematic in the study area.
- Other issues identified included insufficient pedestrian crossings on Uriarra Road as well as other general pedestrian and cyclists issues.
- Uriarra Road was commonly identified as a concern for respondents in regards to traffic flow, cycling, pedestrian movement, parking and reversing out of driveways, in particular during the peak hours.
- The observations and modelling undertaken by GTA Consultants indicate that the intersections of Uriarra Road / Ross Road, Uriarra Road / Crest Road and Uriarra Road / Crawford Street are subject to the highest delays, highest degrees of saturation and worst levels of service.
- Based on the modelling undertaken, the intersection of Uriarra Road / Ross Road is the closest to capacity in the study area with the worst movement at Degree of Saturation 0.87
- The locations where most recorded crashes occurred in the last available 5-year period include:
    - Uriarra Road / Crawford Street – 5 crashes (1 fatality, 3 injury and 1 non-injury)
    - Uriarra Road / McKeahnie Street / Frederick Street – 5 crashes (3 injury, 2 non-injury)
    - Uriarra Road / Crest Road – 5 crashes (1 injury, 4 other)
    - Uriarra Road / Ross Road – 4 crashes (1 injury, 3 other).
- Car parking in the study area peaks at 18%. This occurs on a Saturday at 4:00pm. The busiest road surveyed was Crest Road which peaked at 57%. Overall, there are isolated car parking issues but on the whole, car parking is not an issue within the study area.
- 2006 car ownership within Crestwood, Queanbeyan and post code 2620 is lower than the current DCP car parking requirements.
- As a result of background traffic growth and development outside the study area, the following intersections are expected to experience a significant increase degree of saturation as a result of background traffic growth:
    - Uriarra Road / Crawford Street
    - Uriarra Road / Ross Road
- The following intersections are expected to experience a significant increase in delay as a result of background traffic growth and nearby development:
    - Uriarra Road / Young Street
    - Uriarra Road / McKeahnie Street
    - Uriarra Road / Crest Road.

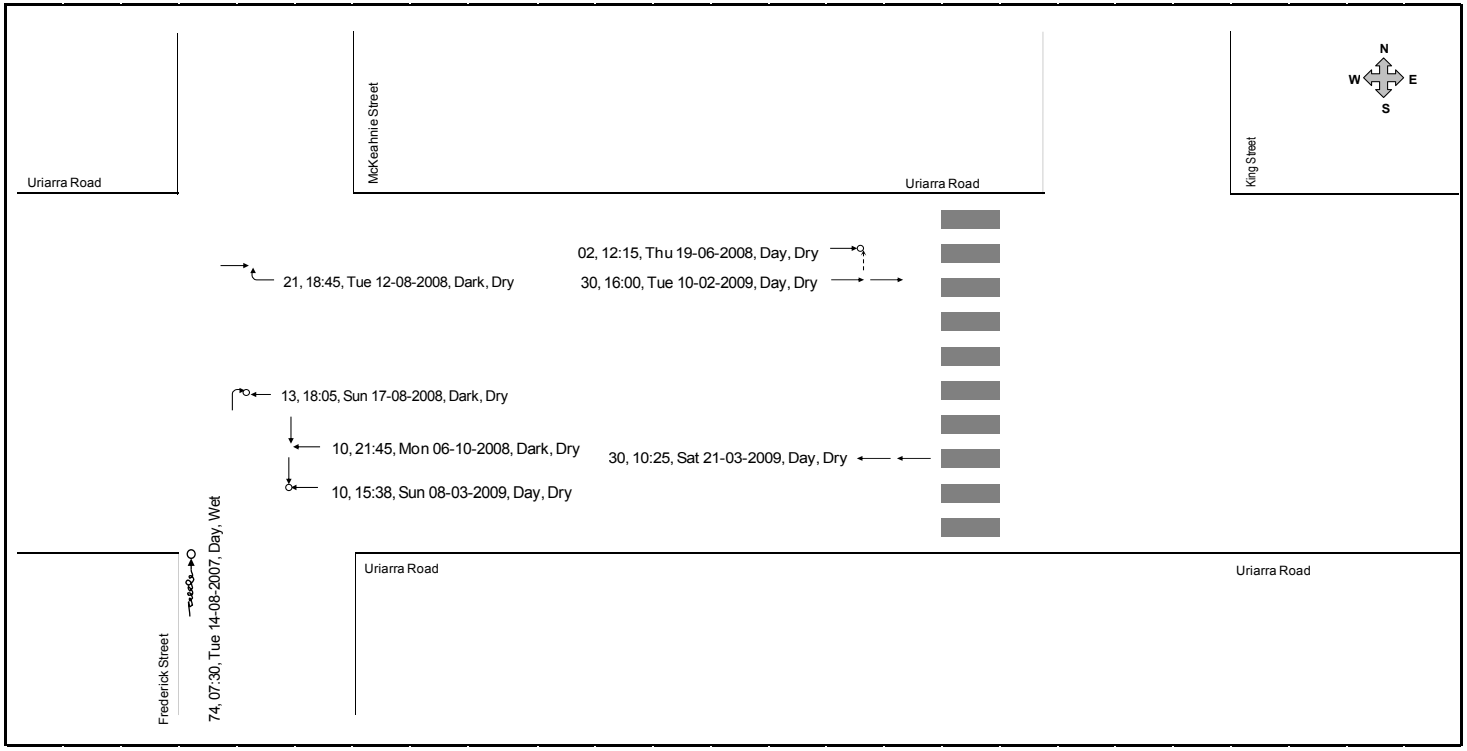
- Assuming no change to the road network and current distribution, under a 100% 2031 future development scenario, the intersections which are not expected to function satisfactorily include:
  - Uriarra Road / Young Street
  - Uriarra Road / Frederick Street / McKeahnie Street
  - Uriarra Road / Crest Road
  - Uriarra Road / Blackall Avenue
  - Uriarra Road / Ross Road
  - Uriarra Road / Crawford Street.
- Option 3 which is the preferred option as it provides the right balance between pedestrian and cycle amenity, crash mitigation, traffic capacity and cost. It is therefore recommended that this option be adopted for North Crestwood.
- Although Option 1 is expected to provide the best overall outcome for the study area, the high cost of traffic signals and impact on the public domain are strong factors which are deterrents for adopting this as the preferred option.
- It is recommended that once the preferred option has been selected by Council (which could include a combination of one or more options), a microsimulation model of the entire study area be prepared to demonstrate the overall network operation to the local community.
- Once the preferred option has been selected by Council a detailed staging plan should be prepared identifying at what stage intersections are required to be upgraded.

Appendix A

Crash Data

Crash Collision Diagram

Location : Intersection of Uriarra Road / Frederick / McKheanie and Uriarra Road / King Street
Municipality : City of Queanbeyan
Control : Give-Way
Project No. : JS10760
Date Drawn : 27-Oct-11
Drawn By : CM
Checked By : MH



Legend

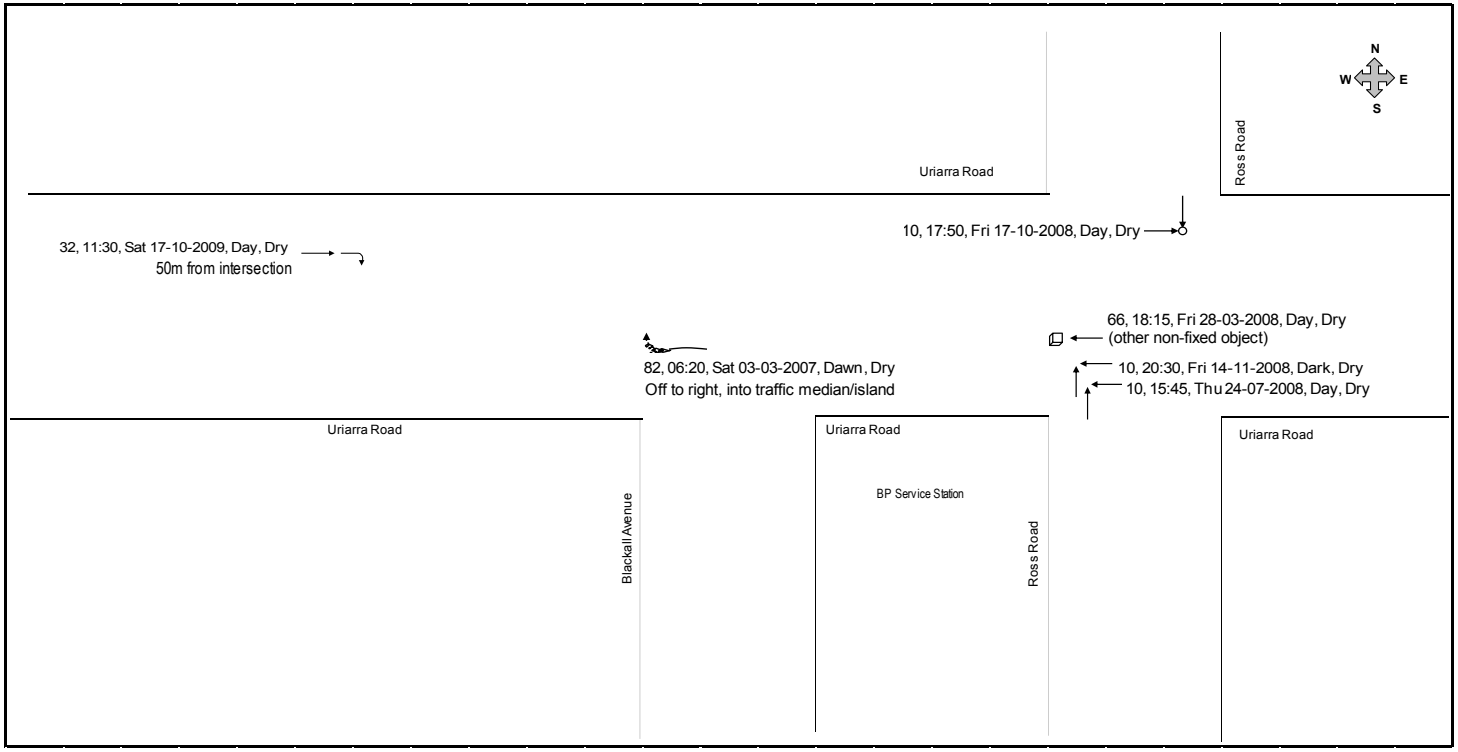
Moving Vehicle	No Injury/Towaway
Backing Vehicle	Injury
Pedestrian	Fatal
Crash description: RUM code, Time, Date, Natural Lighting, Surface Condition	
Motorbike	Stationary Vehicle
Bicycle	Parked Vehicle
	Fixed Object

Accident Summary

Year	Injury Type			Total
	No Injury	Injury	Fatal	
2006	0	0	0	0
2007	0	1	0	1
2008	2	2	0	4
2009	2	1	0	3
2010	0	0	0	0
Total	4	4	0	8

Crash Collision Diagram

Location : Intersection of Uriarra Road /Blackall Avenue and Uriarra Road / Ross Road
Municipality : City of Queanbeyan
Control : Stop
Project No. : JS10760 **Drawn By :** CM
Date Drawn : 27-Oct-11 **Checked By :** MH



Legend

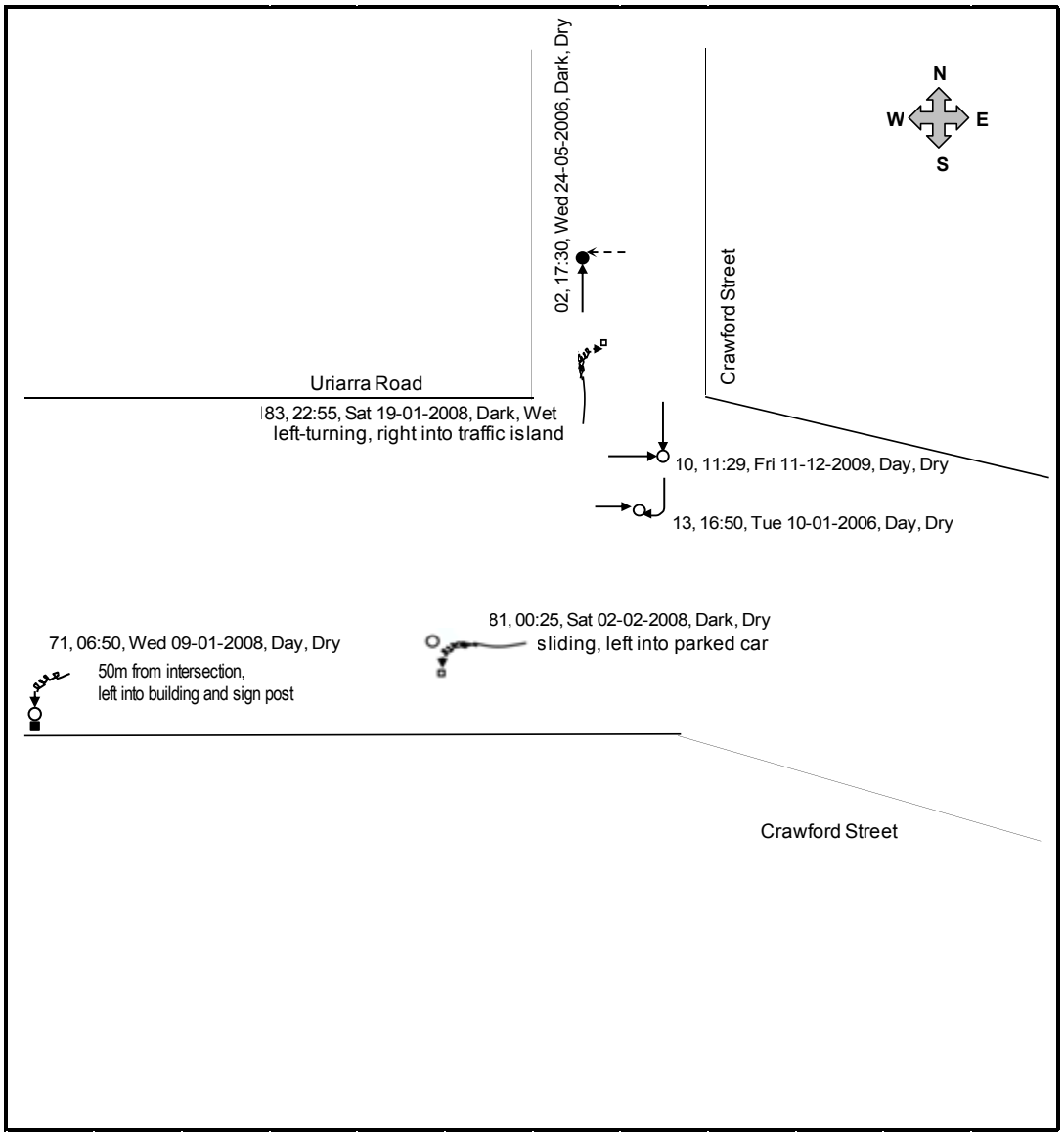
Moving Vehicle	No Injury/Towaway
Backing Vehicle	Injury
Pedestrian	Fatal
Crash description: RUM code, Time, Date, Natural Lighting, Surface Condition	
Motorbike	Stationary Vehicle
Bicycle	Parked Vehicle
	Fixed Object

Accident Summary

Year	Injury Type			Total
	No Injury	Injury	Fatal	
2006	0	0	0	0
2007	1	0	0	1
2008	3	1	0	4
2009	1	0	0	1
2010	0	0	0	0
Total	5	1	0	6

Crash Collision Diagram

Location : Intersection of Uriarra Road and Crawford Road
Municipality : City of Queanbeyan
Control : Give-Way
Project No. : JS10760
Date Drawn : 28-Oct-11
Drawn By : CM
Checked By : MH



Legend

- Moving Vehicle
- Backing Vehicle
- Pedestrian
- No Injury/Towaway
- Injury
- Fatal

Crash description: RUM code, Time, Date, Natural Lighting, Surface Condition

- Motorbike
- Bicycle
- Stationary Vehicle
- Parked Vehicle
- Fixed Object

Accident Summary

Year	Injury Type			Total
	No Injury	Injury	Fatal	
2006	0	1	1	2
2007	0	0	0	0
2008	1	2	0	3
2009	0	1	0	1
2010	0	0	0	0
Total	1	4	1	6

Table A.1: Summary of Crash Data

Crade	Cradate	Cratim	Crast	Crastty	Cradist	Cradirr	Craidob	Craidt	Crage	Cralo	Craaligr	Craperr	Cratem	Crastrl	Crasurl	Crasfcn	Crawth	Cranatl	Crarum	Cradca	Tudirn
2	20060411	0658	CAMPBELL	ST	0	0	CRAWFORD	ST	1	1	2	12	0	8	1	2	1	2	10	101	3
2	20060110	1650	CRAWFORD	ST	0	0	URIARRA	RD	1	3	2	12	0	8	1	2	1	2	13	104	2
2	20060517	0715	HENDERSON	RD	0	0	ROSS	RD	1	3	1	0	0	2	1	2	1	2	88	707	1
1	20060524	1730	CRAWFORD	ST	11	1	URIARRA	RD	1	13	2	0	0	1	1	2	1	4	2	3	1
3	20060710	1230	CRAWFORD	ST	50	1	DERRIMA	RD	1	12	1	0	0	2	1	2	1	2	42	401	3
3	20060708	1520	CAMPBELL	ST	0	0	CRAWFORD	ST	1	1	1	12	0	2	1	2	1	2	10	101	1
3	20060707	1925	URIARRA	RD	5	3	CREST	RD	1	1	1	0	0	1	1	2	1	4	71	703	4
2	20061218	0850	URIARRA	RD	50	3	ROSS	RD	1	12	2	0	0	2	1	2	1	2	30	301	3
3	20061222	1655	CREST	RD	0	0	URIARRA	RD	1	3	1	16	0	8	1	2	1	2	30	301	4
3	20070303	0620	BLACKALL	AVE	0	0	URIARRA	RD	2	3	2	0	0	1	1	2	1	1	82	801	4
3	20070601	1720	DAVIDSON	ST	0	0	URIARRA	RD	1	3	1	0	0	8	1	2	1	3	32	303	4
2	20070323	1750	URIARRA	RD	20	4	FEDERAL	AVE	1	12	2	16	0	2	1	2	1	2	30	301	3
3	20070629	1145	URIARRA	RD	115	3	ROSS	RD	2	12	1	16	0	2	1	2	1	2	32	303	4
2	20070711	1145	URIARRA	RD	155	3	ROSS	RD	2	12	1	16	0	2	1	2	1	2	47	406	2
2	20070809	0620	DERRIMA	RD	0	0	ROSS	RD	1	1	2	13	0	2	1	2	1	1	10	101	1
2	20070830	0815	CAMPBELL	ST	50	2	CRAWFORD	ST	1	12	1	12	0	2	1	2	1	2	1	2	2
2	20070814	0730	MCKEAHNIE	ST	0	0	URIARRA	RD	1	1	1	0	0	1	1	1	1	2	74	705	1
3	20071104	1345	DERRIMA	RD	0	0	HENDERSON	RD	1	3	1	12	0	2	1	1	1	2	71	703	2
2	20071222	0250	HENDERSON	RD	50	4	CREST	RD	1	12	2	0	0	1	1	1	3	4	81	803	3
2	20080202	0025	URIARRA	RD	10	4	CRAWFORD	ST	2	3	2	13	0	8	1	2	1	4	81	803	4
2	20080315	1030	URIARRA	RD	0	0	YOUNG	ST	1	3	1	0	0	2	1	2	1	2	32	303	4
3	20080328	1815	ROSS	RD	0	0	URIARRA	RD	1	1	2	12	0	2	1	2	1	2	66	607	4
2	20080301	1322	CAMPBELL	ST	0	0	CRAWFORD	ST	1	1	1	0	0	8	1	2	1	2	33	305	4
2	20080619	1215	URIARRA	RD	20	4	KING	ST	2	13	1	0	0	2	1	2	3	2	2	3	3
2	20080209	0650	URIARRA	RD	50	4	CRAWFORD	ST	1	12	1	13	0	2	1	2	1	2	71	703	4
3	20080108	1830	MCKEAHNIE	ST	50	1	URIARRA	RD	1	12	1	0	0	2	1	2	1	3	71	703	2
3	20080119	2255	CRAWFORD	ST	0	0	URIARRA	RD	1	3	2	0	0	1	1	1	2	4	85	804	1
3	20080724	1545	ROSS	RD	0	0	URIARRA	RD	1	1	1	13	0	2	1	2	1	2	10	101	1
2	20080817	1805	FREDERICK	ST	0	0	URIARRA	RD	1	1	2	0	0	1	1	2	1	4	13	104	1
3	20080812	1845	MCKEAHNIE	ST	0	0	URIARRA	RD	1	1	1	0	0	1	1	2	1	4	21	202	4
3	20081005	2145	FREDERICK	ST	0	0	URIARRA	RD	1	1	1	0	0	8	1	2	1	4	10	101	2
3	20081007	0645	CAMPBELL	ST	0	0	CRAWFORD	ST	2	1	1	0	0	2	1	2	1	2	13	104	1
2	20081029	1640	CAMPBELL	ST	30	2	CRAWFORD	ST	1	12	1	0	0	2	1	2	1	2	30	301	2
3	20080828	2200	URIARRA	RD	50	3	RAILWAY	AVE	1	12	1	0	0	1	1	2	1	4	71	703	4
2	20081017	1750	URIARRA	RD	0	0	ROSS	RD	1	1	1	12	0	2	1	2	1	2	10	101	2
3	20081114	2030	URIARRA	RD	0	0	ROSS	RD	1	1	1	0	0	1	1	2	1	4	10	101	1
2	20081231	1605	CAMPBELL	ST	0	0	COLLETT	ST	1	1	1	0	0	8	1	2	1	2	10	101	4
2	20090308	1538	FREDERICK	ST	0	0	URIARRA	RD	1	1	1	0	0	2	1	2	1	2	10	101	2
3	20090210	1600	URIARRA	RD	15	4	KING	ST	2	12	1	0	0	2	1	2	1	2	30	301	3
3	20090321	1025	URIARRA	RD	10	4	KING	ST	2	3	1	0	0	2	1	2	1	2	30	301	4
3	20090524	1410	URIARRA	RD	56	4	CREST	RD	1	13	1	0	0	2	1	2	1	2	71	703	3
2	20090721	1640	URIARRA	RD	20	3	CREST	RD	1	12	1	0	0	2	1	2	1	2	71	703	3
2	20090708	0910	CRAWFORD	ST	0	0	ERIN	ST	1	1	1	0	0	8	1	2	1	2	10	101	4
3	20090803	1440	CREST	RD	0	0	URIARRA	RD	1	1	1	0	0	2	1	2	1	2	21	202	3
3	20090803	0026	HENDERSON	RD	50	4	CREST	RD	1	12	2	0	0	1	1	2	1	4	83	803	3
2	20090904	2200	CAMPBELL	ST	0	0	COLLETT	ST	1	1	1	13	0	1	1	2	1	4	10	101	2
2	20091016	1040	DAVISON	ST	0	0	URIARRA	RD	1	3	1	0	0	2	1	2	3	2	30	301	4
3	20091017	1130	URIARRA	RD	50	4	ROSS	RD	1	12	2	16	0	2	1	2	1	2	32	303	4
2	20090828	0700	CAMPBELL	ST	0	0	CRAWFORD	ST	1	1	1	12	0	2	1	2	1	2	21	202	2
3	20090724	1630	CRAWFORD	ST	0	0	ERIN	ST	1	1	1	0	0	2	1	2	1	3	11	102	3
3	20091112	0800	CAMPBELL	ST	0	0	CRAWFORD	ST	1	1	1	12	0	2	1	2	1	2	10	101	1
3	20091027	0855	FEDERAL	AVE	0	0	URIARRA	RD	1	3	1	0	0	8	1	2	1	2	30	301	3
2	20091211	1129	CRAWFORD	ST	0	0	URIARRA	RD	1	3	2	0	0	8	1	2	1	2	10	101	2
2	20100125	0840	URIARRA	RD	50	3	ROSS	RD	1	12	2	16	0	2	1	2	1	2	32	303	4
2	20100415	1640	STORNAWAY	RD	0	0	URIARRA	RD	1	3	1	12	0	1	1	2	1	4	2	3	1

Appendix B

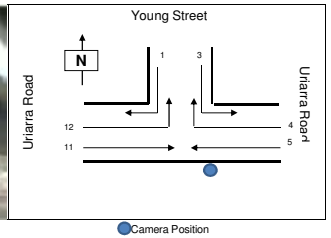
Traffic Count Results

Intersection of Uriarra Road and Young Street

Thursday, 5 May 2011

Austraffic

Survey Start	7:00 AM	16:00 PM	
Intersection Type	T Junction		
Intersection No.	1		
North Approach	Young Street		
East Approach	Uriarra Road		
South Approach			
West Approach	Uriarra Road		
Date	5/05/11		
Classification	Light	Heavy	



TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6			VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
7:00 - 7:15	17	0	17				1	0	1	2	0	2	135	3	138																54	7	61	4	0	4	213	10	223
7:15 - 7:30	20	0	20				2	0	2	1	0	1	164	10	174																52	6	58	3	0	3	242	16	258
7:30 - 7:45	17	0	17				2	0	2	1	0	1	226	12	238																57	5	62	7	0	7	310	17	327
7:45 - 8:00	13	0	13				5	0	5	1	0	1	269	4	273																76	6	82	8	2	10	372	12	384
8:00 - 8:15	13	0	13				4	0	4	2	0	2	254	9	263																70	12	82	5	0	5	348	21	369
8:15 - 8:30	8	0	8				0	1	1	1	0	1	208	5	213																94	5	99	3	0	3	314	11	325
8:30 - 8:45	15	1	16				2	0	2	0	0	0	164	13	177																81	7	88	6	1	7	268	22	290
8:45 - 9:00	7	0	7				6	0	6	2	0	2	180	5	185																108	12	120	4	0	4	307	17	324
Σ	110	1	111				22	1	23	10	0	10	1600	61	1661																592	60	652	40	3	43	2374	126	2500

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6			VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
16:00 - 16:15	4	0	4				1	0	1	1	0	1	100	6	106																236	2	238	11	0	11	353	8	361
16:15 - 16:30	9	0	9				0	0	0	4	0	4	115	4	119																256	5	261	9	1	10	393	10	403
16:30 - 16:45	2	0	2				5	0	5	1	0	1	107	3	110																260	4	264	19	0	19	384	7	401
16:45 - 17:00	6	0	6				5	0	5	1	0	1	91	6	97																252	7	259	12	0	12	367	13	380
17:00 - 17:15	6	1	7				0	0	0	1	0	1	110	2	112																268	9	277	20	1	21	405	13	418
17:15 - 17:30	7	2	9				0	0	0	2	0	2	100	4	104																245	2	247	15	1	16	369	9	378
17:30 - 17:45	11	0	11				0	0	0	2	0	2	103	0	103																271	4	275	8	0	8	395	4	399
17:45 - 18:00	6	0	6				1	0	1	2	0	2	89	2	91																230	3	233	11	0	11	339	5	344
Σ	51	3	54				12	0	12	14	0	14	815	27	842																2018	36	2054	105	3	108	3015	69	3084

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6			VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL			
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
7:00 - 8:00	67	0	67				10	0	10	5	0	5	794	29	823																239	24	263	22	2	24	1137	55	1192	
7:15 - 8:15	63	0	63				13	0	13	5	0	5	913	35	948																255	29	284	23	2	25	1272	66	1338	
7:30 - 8:30	**51**	**0**	**51**				**11**	**1**	**12**	**5**	**0**	**5**	**957**	**30**	**987**																**297**	**28**	**325**	**23**	**2**	**25**	**1344**	**61**	**1405**	**Peak**
7:45 - 8:45	49	1	50				11	1	12	4	0	4	895	31	926																321	30	351	22	3	25	1302	66	1368	
8:00 - 9:00	43	1	44				12	1	13	5	0	5	806	32	838																353	36	389	18	1	19	1237	71	1308	

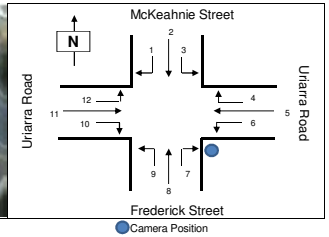
TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6			VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL			
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
16:00 - 17:00	21	0	21				11	0	11	7	0	7	413	19	432																1004	18	1022	51	1	52	1507	38	1545	
16:15 - 17:15	**23**	**1**	**24**				**10**	**0**	**10**	**7**	**0**	**7**	**423**	**15**	**438**																**1036**	**23**	**1061**	**50**	**2**	**52**	**1559**	**43**	**1602**	**Peak**
16:30 - 17:30	21	3	24				10	0	10	5	0	5	408	15	423																1025	22	1047	66	2	68	1535	42	1577	
16:45 - 17:45	30	3	33				5	0	5	6	0	6	404	12	416																1036	22	1058	55	2	57	1536	39	1575	
17:00 - 18:00	30	3	33				1	0	1	7	0	7	402	8	410																1014	18	1032	54	2	56	1508	31	1539	

Intersection of Uriarra Road, McKeahnie Street and Frederick Street

Thursday, 5 May 2011

Austraffic

Survey Start	7:00 AM 16:00 PM
Intersection Type	Cross Junction
Intersection No.	2
North Approach	McKeahnie Street
East Approach	Uriarra Road
South Approach	Frederick Street
West Approach	Uriarra Road
Date	5/05/11
Classification	Light Heavy



Camera Position

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
7:00 - 7:15	2	0	2	0	0	0	2	1	3	0	0	0	125	3	128	1	0	1
7:15 - 7:30	12	0	12	1	0	1	2	0	2	0	0	0	147	10	157	0	1	1
7:30 - 7:45	10	0	10	0	0	0	1	0	1	1	0	1	198	14	212	8	0	8
7:45 - 8:00	7	0	7	0	0	0	3	0	3	1	0	1	246	3	249	2	1	3
8:00 - 8:15	13	0	13	0	0	0	0	0	0	0	0	0	228	10	238	7	0	7
8:15 - 8:30	8	0	8	0	0	0	4	0	4	0	0	0	181	3	184	4	0	4
8:30 - 8:45	6	0	6	0	0	0	3	0	3	1	0	1	156	13	169	3	0	3
8:45 - 9:00	6	0	6	1	0	1	3	0	3	1	0	1	156	6	162	1	0	1
Σ	64	0	64	2	0	2	18	1	19	4	0	4	1437	62	1499	26	2	28

TIME PERIOD	VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
7:00 - 7:15	2	0	2	0	0	0	5	0	5	0	0	0	56	7	63	1	1	2	194	12	206
7:15 - 7:30	0	0	0	0	0	0	4	0	4	0	0	0	54	7	61	1	0	1	221	18	239
7:30 - 7:45	1	0	1	0	0	0	13	1	14	1	0	1	57	6	63	0	0	0	290	21	311
7:45 - 8:00	6	0	6	0	0	0	15	0	15	0	0	0	77	6	83	2	0	2	359	10	369
8:00 - 8:15	2	0	2	0	0	0	8	0	8	0	0	0	75	12	87	1	0	1	334	22	356
8:15 - 8:30	1	0	1	1	0	1	15	0	15	0	0	0	94	6	100	2	0	2	310	9	319
8:30 - 8:45	3	0	3	0	0	0	9	0	9	1	0	1	86	7	93	4	0	4	272	20	292
8:45 - 9:00	2	1	3	0	0	0	10	0	10	0	2	2	114	10	124	0	0	0	294	19	313
Σ	17	1	18	1	0	1	79	1	80	2	2	4	613	61	674	11	1	12	2274	131	2405

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
16:00 - 16:15	2	0	2	1	0	1	0	0	0	0	0	0	101	6	107	5	0	5
16:15 - 16:30	2	0	2	0	0	0	1	0	1	0	0	0	109	4	113	2	0	2
16:30 - 16:45	2	0	2	0	0	0	3	0	3	0	0	0	107	3	110	4	0	4
16:45 - 17:00	4	0	4	0	0	0	1	0	1	0	0	0	86	7	93	6	0	6
17:00 - 17:15	1	0	1	1	0	1	4	0	4	1	0	1	105	2	107	7	0	7
17:15 - 17:30	3	0	3	0	0	0	4	0	4	2	0	2	98	4	102	8	0	8
17:30 - 17:45	8	0	8	0	0	0	3	0	3	1	0	1	91	0	91	5	0	5
17:45 - 18:00	4	0	4	2	0	2	3	0	3	0	0	0	86	2	88	5	0	5
Σ	26	0	26	4	0	4	19	0	19	4	0	4	783	28	811	42	0	42

TIME PERIOD	VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
16:00 - 16:15	2	0	2	0	0	0	2	0	2	4	0	4	232	2	234	2	0	2	351	8	359
16:15 - 16:30	1	0	1	0	0	0	4	0	4	3	0	3	248	6	254	4	0	4	374	10	384
16:30 - 16:45	1	0	1	1	0	1	1	0	1	3	0	3	254	4	258	5	0	5	381	7	388
16:45 - 17:00	4	0	4	0	0	0	1	0	1	1	0	1	248	6	254	8	0	8	359	13	372
17:00 - 17:15	0	0	0	0	0	0	3	0	3	3	0	3	261	10	271	3	0	3	389	12	401
17:15 - 17:30	1	0	1	2	0	2	3	0	3	2	0	2	236	1	237	2	0	2	361	5	366
17:30 - 17:45	1	0	1	2	0	2	3	0	3	4	0	4	261	4	265	5	0	5	384	4	388
17:45 - 18:00	1	0	1	1	0	1	3	0	3	6	0	6	219	2	221	5	0	5	335	4	339
Σ	11	0	11	6	0	6	20	0	20	26	0	26	1959	35	1994	34	0	34	2934	63	2997

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
7:00 - 8:00	31	0	31	1	0	1	8	1	9	2	0	2	716	30	746	11	2	13
7:15 - 8:15	42	0	42	1	0	1	6	0	6	2	0	2	819	37	856	17	2	19
7:30 - 8:30	**38**	**0**	**38**	**0**	**0**	**0**	**8**	**0**	**8**	**2**	**0**	**2**	**853**	**30**	**883**	**21**	**1**	**22**
7:45 - 8:45	34	0	34	0	0	0	10	0	10	2	0	2	811	29	840	16	1	17
8:00 - 9:00	33	0	33	1	0	1	10	0	10	2	0	2	721	32	753	15	0	15

TIME PERIOD	VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL			
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
7:00 - 8:00	9	0	9	0	0	0	37	1	38	1	0	1	244	26	270	4	1	5	1064	61	1125	
7:15 - 8:15	9	0	9	0	0	0	40	1	41	1	0	1	263	31	294	4	0	4	1204	71	1275	
7:30 - 8:30	**10**	**0**	**10**	**1**	**0**	**1**	**51**	**1**	**52**	**1**	**0**	**1**	**303**	**30**	**333**	**5**	**0**	**5**	**1293**	**62**	**1355**	**Peak**
7:45 - 8:45	12	0	12	1	0	1	47	0	47	1	0	1	332	31	363	9	0	9	1275	61	1336	
8:00 - 9:00	8	1	9	1	0	1	42	0	42	1	2	3	369	35	404	7	0	7	1210	70	1280	

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
16:00 - 17:00	10	0	10	1	0	1	5	0	5	0	0	0	403	20	423	17	0	17
16:15 - 17:15	**9**	**0**	**9**	**1**	**0**	**1**	**5**	**0**	**5**	**1**	**0**	**1**	**407**	**18**	**425**	**19**	**0**	**19**
16:30 - 17:30	10	0	10	1	0	1	12	0	12	3	0	3	396	16	412	25	0	25
16:45 - 17:45	16	0	16	1	0	1	12	0	12	4	0	4	380	13	393	26	0	26
17:00 - 18:00	16	0	16	3	0	3	14	0	14	4	0	4	380	8	388	25	0	25

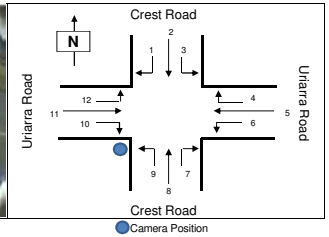
TIME PERIOD	VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL			
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
16:00 - 17:00	8	0	8	1	0	1	8	0	8	11	0	11	992	18	1000	19	0	19	1465	38	1503	
16:15 - 17:15	**3**	**0**	**3**	**1**	**0**	**1**	**8**	**0**	**8**	**10**	**0**	**10**	**1011**	**26**	**1037**	**20**	**0**	**20**	**1503**	**42**	**1545**	**Peak**
16:30 - 17:30	3	0	3	3	0	3	8	0	8	9	0	9	999	21	1020	18	0	18	1490	37	1527	
16:45 - 17:45	3	0	3	4	0	4	10	0	10	10	0	10	1008	19	1027	18	0	18	1493	34	1527	
17:00 - 18:00	5	0	5	12	0	12	12	0	12	15	0	15	977	17	994	15	0	15	1469	25	1494	

Intersection of Uriarra Road and Crest Road

Thursday, 5 May 2011

Austraffic

Survey Start	7:00 AM	16:00 PM	
Intersection Type	Cross Junction		
Intersection No.	3		
North Approach	Crest Road		
East Approach	Uriarra Road		
South Approach	Crest Road		
West Approach	Uriarra Road		
Date	5/05/11		
Classification	Light	Heavy	



Camera Position

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
7:00 - 7:15	6	0	6	0	0	0	2	0	2	2	0	2	126	4	130	5	1	6
7:15 - 7:30	4	0	4	1	0	1	3	2	5	2	0	2	135	11	146	1	0	1
7:30 - 7:45	10	1	11	0	0	0	3	0	3	1	0	1	185	11	196	2	0	2
7:45 - 8:00	15	0	15	0	0	0	6	0	6	4	0	4	219	5	224	2	0	2
8:00 - 8:15	10	0	10	0	0	0	3	0	3	1	0	1	220	9	229	4	0	4
8:15 - 8:30	11	0	11	1	0	1	2	0	2	3	0	3	168	4	172	3	0	3
8:30 - 8:45	5	0	5	1	0	1	2	0	2	3	0	3	142	12	154	4	0	4
8:45 - 9:00	6	1	7	1	0	1	6	0	6	3	0	3	153	4	157	4	0	4
Σ	67	2	69	4	0	4	27	2	29	19	0	19	1348	60	1408	25	1	26

TIME PERIOD	VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
7:00 - 7:15	0	0	0	0	0	0	3	0	3	1	0	1	57	7	64	3	0	3	205	12	217
7:15 - 7:30	0	0	0	0	0	0	7	1	8	1	0	1	46	7	53	0	1	1	200	22	222
7:30 - 7:45	0	0	0	0	0	0	9	0	9	0	0	0	69	6	75	1	0	1	280	18	298
7:45 - 8:00	0	0	0	0	0	0	7	0	7	4	0	4	77	4	81	3	0	3	337	9	346
8:00 - 8:15	0	0	0	0	0	0	11	0	11	2	0	2	72	10	82	1	0	1	324	19	343
8:15 - 8:30	0	0	0	0	0	0	2	0	2	1	0	1	100	9	109	2	0	2	293	13	306
8:30 - 8:45	0	0	0	0	0	0	7	0	7	2	0	2	92	8	100	6	0	6	264	20	284
8:45 - 9:00	0	0	0	0	0	0	11	1	12	8	0	8	103	8	111	3	0	3	298	14	312
Σ	0	0	0	0	0	0	57	2	59	19	0	19	616	59	675	19	1	20	2201	127	2328

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
16:00 - 16:15	3	0	3	0	0	0	3	0	3	4	0	4	93	6	99	3	0	3
16:15 - 16:30	5	0	5	0	0	0	9	0	9	4	0	4	104	4	108	2	0	2
16:30 - 16:45	7	0	7	0	0	0	6	0	6	5	0	5	105	3	108	6	0	6
16:45 - 17:00	4	0	4	0	0	0	3	0	3	10	0	10	87	6	93	3	0	3
17:00 - 17:15	2	0	2	0	0	0	1	0	1	6	0	6	104	2	106	2	0	2
17:15 - 17:30	2	0	2	1	0	1	6	0	6	6	0	6	96	5	101	7	0	7
17:30 - 17:45	4	0	4	1	0	1	5	0	5	2	0	2	94	0	94	5	0	5
17:45 - 18:00	1	0	1	0	0	0	6	0	6	2	0	2	84	2	86	2	0	2
Σ	28	0	28	2	0	2	39	0	39	39	0	39	767	28	795	30	0	30

TIME PERIOD	VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
16:00 - 16:15	0	0	0	0	0	0	3	0	3	2	0	2	208	2	210	11	0	11	330	8	338
16:15 - 16:30	0	0	0	0	0	0	3	0	3	3	0	3	237	4	241	6	0	6	373	8	381
16:30 - 16:45	0	0	0	0	0	0	2	0	2	4	0	4	262	6	268	6	0	6	403	9	412
16:45 - 17:00	0	0	0	0	0	0	0	0	0	7	0	7	233	5	238	7	0	7	354	11	365
17:00 - 17:15	0	0	0	0	0	0	6	0	6	5	1	6	250	11	261	2	0	2	378	14	392
17:15 - 17:30	0	0	0	0	0	0	4	0	4	8	1	9	227	1	228	5	0	5	362	7	369
17:30 - 17:45	0	0	0	0	0	0	5	0	5	16	0	16	239	4	243	6	0	6	377	4	381
17:45 - 18:00	0	0	0	0	0	0	5	0	5	5	0	5	207	3	210	11	0	11	323	5	328
Σ	0	0	0	0	0	0	28	0	28	50	2	52	1863	36	1899	54	0	54	2900	66	2966

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
7:00 - 8:00	35	1	36	1	0	1	14	2	16	9	0	9	665	31	696	10	1	11
7:15 - 8:15	39	1	40	1	0	1	15	2	17	8	0	8	759	36	795	9	0	9
7:30 - 8:30	**46**	**1**	**47**	**1**	**0**	**1**	**14**	**0**	**14**	**9**	**0**	**9**	**792**	**29**	**821**	**11**	**0**	**11**
7:45 - 8:45	41	0	41	2	0	2	13	0	13	11	0	11	749	30	779	13	0	13
8:00 - 9:00	32	1	33	3	0	3	13	0	13	10	0	10	683	29	712	15	0	15

TIME PERIOD	VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL			
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
7:00 - 8:00	0	0	0	0	0	0	26	1	27	6	0	6	249	24	273	7	1	8	1022	61	1083	
7:15 - 8:15	0	0	0	0	0	0	34	1	35	7	0	7	264	27	291	5	1	6	1141	68	1209	
7:30 - 8:30	**0**	**0**	**0**	**0**	**0**	**0**	**29**	**0**	**29**	**7**	**0**	**7**	**318**	**29**	**347**	**7**	**0**	**7**	**1234**	**59**	**1293**	**Peak**
7:45 - 8:45	0	0	0	0	0	0	27	0	27	9	0	9	341	31	372	12	0	12	1218	61	1279	
8:00 - 9:00	0	0	0	0	0	0	31	1	32	13	0	13	367	35	402	12	0	12	1179	66	1245	

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
16:00 - 17:00	19	0	19	0	0	0	21	0	21	23	0	23	389	19	408	14	0	14
16:15 - 17:15	**16**	**0**	**16**	**0**	**0**	**0**	**19**	**0**	**19**	**23**	**0**	**23**	**400**	**15**	**415**	**13**	**0**	**13**
16:30 - 17:30	15	0	15	1	0	1	16	0	16	24	0	24	392	16	408	18	0	18
16:45 - 17:45	12	0	12	2	0	2	15	0	15	24	0	24	381	13	394	17	0	17
17:00 - 18:00	9	0	9	2	0	2	18	0	18	16	0	16	378	9	387	16	0	16

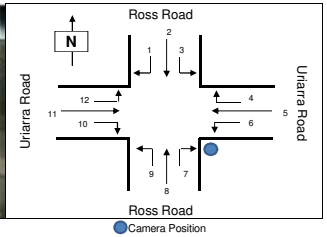
TIME PERIOD	VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL			
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
16:00 - 17:00	0	0	0	0	0	0	8	0	8	16	0	16	940	17	957	30	0	30	1460	36	1496	
16:15 - 17:15	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**0**	**11**	**19**	**1**	**20**	**962**	**26**	**1008**	**21**	**0**	**21**	**1508**	**42**	**1550**	**Peak**
16:30 - 17:30	0	0	0	0	0	0	12	0	12	24	2	26	972	23	995	20	0	20	1497	41	1538	
16:45 - 17:45	0	0	0	0	0	0	15	0	15	36	2	38	949	21	970	20	0	20	1471	36	1507	
17:00 - 18:00	0	0	0	0	0	0	20	0	20	34	2	36	923	19	942	24	0	24	1440	30	1470	

Intersection of Uriarra Road and Ross Road

Thursday, 5 May 2011

Austraffic

Survey Start	7:00 AM 16:00 PM
Intersection Type	Cross Junction
Intersection No.	4
North Approach	Ross Road
East Approach	Uriarra Road
South Approach	Ross Road
West Approach	Uriarra Road
Date	5/05/11
Classification	Light Heavy



Camera Position

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
7:00 - 7:15	1	0	1	2	0	2	1	0	1	0	0	0	99	3	102	9	1	10
7:15 - 7:30	0	0	0	1	0	1	1	1	2	0	0	0	107	10	117	9	0	9
7:30 - 7:45	4	0	4	2	0	2	2	0	2	1	0	1	153	10	163	6	1	7
7:45 - 8:00	0	0	0	4	1	5	1	0	1	0	0	0	180	2	182	8	0	8
8:00 - 8:15	0	0	0	0	0	0	2	0	2	4	0	4	196	10	206	9	0	9
8:15 - 8:30	0	0	0	4	0	4	5	1	6	2	0	2	151	3	154	9	0	9
8:30 - 8:45	2	0	2	0	0	0	2	0	2	1	0	1	128	13	141	9	1	10
8:45 - 9:00	0	0	0	5	0	5	3	0	3	2	0	2	127	6	133	10	0	10
Σ	7	0	7	18	1	19	17	2	19	10	0	10	1141	57	1198	69	3	72

TIME PERIOD	VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
7:00 - 7:15	4	0	4	5	0	5	8	0	8	3	1	4	60	6	66	2	1	3	194	12	206
7:15 - 7:30	4	0	4	7	1	8	14	0	14	6	1	7	54	4	58	2	0	2	205	17	222
7:30 - 7:45	4	0	4	11	0	11	15	0	15	7	0	7	73	5	78	2	0	2	280	16	296
7:45 - 8:00	2	1	3	11	0	11	31	1	32	5	0	5	88	4	92	3	0	3	333	9	342
8:00 - 8:15	4	0	4	13	0	13	23	0	23	5	0	5	78	10	88	5	0	5	339	20	359
8:15 - 8:30	1	0	1	23	0	23	17	0	17	6	0	6	99	9	108	2	1	3	319	14	333
8:30 - 8:45	3	0	3	8	0	8	9	0	9	3	1	4	101	7	108	5	0	5	271	22	293
8:45 - 9:00	8	0	8	7	0	7	13	0	13	3	0	3	115	9	124	4	0	4	297	15	312
Σ	30	1	31	85	1	86	130	1	131	38	3	41	668	54	722	25	2	27	2238	125	2363

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
16:00 - 16:15	0	0	0	8	0	8	4	0	4	3	0	3	102	6	108	15	0	15
16:15 - 16:30	1	0	1	10	0	10	3	0	3	5	0	5	104	4	108	14	0	14
16:30 - 16:45	2	0	2	4	0	4	4	0	4	1	0	1	110	2	112	11	0	11
16:45 - 17:00	1	0	1	5	0	5	1	0	1	2	0	2	101	8	109	14	0	14
17:00 - 17:15	1	0	1	3	0	3	6	1	7	3	0	3	109	2	111	10	0	10
17:15 - 17:30	1	0	1	5	0	5	2	0	2	4	0	4	114	4	118	12	0	12
17:30 - 17:45	1	0	1	7	0	7	2	0	2	3	0	3	103	0	103	15	0	15
17:45 - 18:00	0	0	0	7	0	7	7	0	7	2	0	2	96	2	98	13	0	13
Σ	7	0	7	49	0	49	29	1	30	23	0	23	839	28	867	104	0	104

TIME PERIOD	VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL			
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
16:00 - 16:15	6	0	6	2	0	2	11	0	11	12	0	12	198	2	200	2	0	2	363	8	371	
16:15 - 16:30	4	0	4	8	0	8	9	0	9	12	0	12	238	4	242	2	0	2	410	8	418	
16:30 - 16:45	3	0	3	4	0	4	7	1	8	17	0	17	240	6	246	2	0	2	411	9	420	
16:45 - 17:00	6	0	6	3	0	3	7	0	7	13	1	14	211	4	215	6	0	6	370	13	383	
17:00 - 17:15	10	0	10	3	0	3	11	0	11	14	1	15	229	8	237	6	0	6	405	12	417	
17:15 - 17:30	10	0	10	3	0	3	7	0	7	21	0	21	199	0	199	4	0	4	382	4	386	
17:30 - 17:45	16	0	16	1	0	1	18	0	18	20	0	20	217	4	221	3	0	3	406	4	410	
17:45 - 18:00	11	0	11	5	0	5	9	0	9	22	0	22	188	3	191	4	0	4	364	5	369	
Σ	72	0	72	29	0	29	79	1	80	131	2	133	1720	31	1751	29	0	29	3111	63	3174	

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
7:00 - 8:00	5	0	5	9	1	10	5	1	6	1	0	1	539	25	564	32	2	34
7:15 - 8:15	4	0	4	7	1	8	6	1	7	5	0	5	636	32	668	32	1	33
7:30 - 8:30	4	0	4	10	1	11	10	1	11	7	0	7	680	25	705	32	1	33
7:45 - 8:45	2	0	2	8	1	9	10	1	11	7	0	7	655	28	683	35	1	36
8:00 - 9:00	2	0	2	9	0	9	12	1	13	9	0	9	602	32	634	37	1	38

TIME PERIOD	VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL			
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
7:00 - 8:00	14	1	15	34	1	35	68	1	69	21	2	23	275	19	294	9	1	10	1012	54	1066	
7:15 - 8:15	14	1	15	42	1	43	83	1	84	23	1	24	293	23	316	12	0	12	1157	62	1219	
7:30 - 8:30	11	1	12	58	0	58	86	1	87	23	0	23	338	28	366	12	1	13	1271	59	1330	Peak
7:45 - 8:45	10	1	11	55	0	55	80	1	81	19	1	20	366	30	396	15	1	16	1262	65	1327	
8:00 - 9:00	16	0	16	51	0	51	62	0	62	17	1	18	393	35	428	16	1	17	1226	71	1297	

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
16:00 - 17:00	4	0	4	27	0	27	12	0	12	11	0	11	417	20	437	54	0	54
16:15 - 17:15	3	0	3	22	0	22	14	1	15	11	0	11	422	18	440	49	0	49
16:30 - 17:30	5	0	5	17	0	17	13	1	14	10	0	10	432	18	450	47	0	47
16:45 - 17:45	4	0	4	20	0	20	11	1	12	12	0	12	427	14	441	51	0	51
17:00 - 18:00	3	0	3	22	0	22	17	1	18	12	0	12	422	8	430	50	0	50

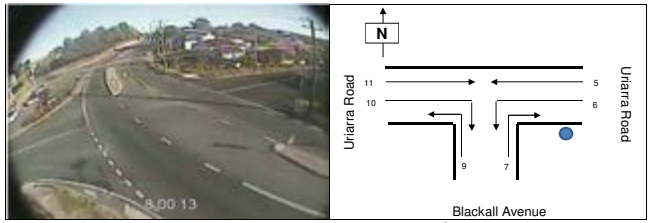
TIME PERIOD	VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL			
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
16:00 - 17:00	25	0	25	17	0	17	34	1	35	54	1	55	887	16	903	12	0	12	1554	38	1592	
16:15 - 17:15	29	0	29	10	0	10	34	1	35	56	2	58	919	22	940	16	0	16	1596	42	1638	Peak
16:30 - 17:30	35	0	35	13	0	13	32	1	33	65	2	67	879	18	897	18	0	18	1568	38	1606	
16:45 - 17:45	42	0	42	10	0	10	43	0	43	68	2	70	856	16	872	19	0	19	1563	33	1596	
17:00 - 18:00	47	0	47	12	0	12	45	0	45	77	1	78	833	15	848	17	0	17	1557	25	1582	

Intersection of Uriarra Road and Blackall Avenue

Thursday, 5 May 2011

Austraffic

Survey Start	7:00 AM 16:00 PM
Intersection Type	T Junction
Intersection No.	5
North Approach	
East Approach	Uriarra Road
South Approach	Blackall Avenue
West Approach	Uriarra Road
Date	5/05/11
Classification	Light Heavy



TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6			VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
7:00 - 7:15													107	3	110	1	0	1	4	0	4				9	0	9	2	0	2	61	8	69				184	11	195
7:15 - 7:30													119	10	129	0	0	0	10	0	10				13	0	13	0	1	1	52	5	57				194	16	210
7:30 - 7:45													171	10	181	2	0	2	5	1	6				14	1	15	0	1	1	77	4	81				269	17	286
7:45 - 8:00													209	3	212	1	0	1	11	0	11				11	0	11	2	0	2	85	4	89				319	7	326
8:00 - 8:15													210	10	220	8	0	8	7	0	7				11	0	11	2	0	2	80	10	90				318	20	338
8:15 - 8:30													162	3	165	4	0	4	9	0	9				11	0	11	1	0	1	100	10	110				287	13	300
8:30 - 8:45													135	13	148	3	0	3	7	0	7				9	1	10	1	0	1	103	8	111				258	22	280
8:45 - 9:00													138	5	143	2	1	3	8	0	8				11	0	11	4	0	4	113	9	122				276	15	291
Σ													1251	57	1308	21	1	22	61	1	62				89	2	91	12	2	14	671	58	729				2105	121	2226

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6			VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
16:00 - 16:15													99	6	105	15	0	15	5	0	5				5	0	5	3	0	3	207	2	209				334	8	342
16:15 - 16:30													111	4	115	3	0	3	4	0	4				4	0	4	4	0	4	249	4	253				374	8	382
16:30 - 16:45													112	3	115	7	0	7	3	0	3				1	0	1	10	0	10	255	6	261				388	9	397
16:45 - 17:00													100	6	106	9	1	10	6	0	6				6	0	6	14	0	14	226	5	231				361	12	373
17:00 - 17:15													113	3	116	7	0	7	2	0	2				6	0	6	7	0	7	244	9	253				379	12	391
17:15 - 17:30													114	4	118	7	0	7	4	0	4				1	0	1	12	0	12	221	0	221				359	4	363
17:30 - 17:45													104	0	104	18	0	18	5	0	5				4	0	4	9	0	9	235	4	239				375	4	379
17:45 - 18:00													94	2	96	11	0	11	5	0	5				8	0	8	8	0	8	209	2	211				335	4	339
Σ													847	28	875	77	1	78	34	0	34				35	0	35	67	0	67	1845	32	1877				2905	61	2966

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6			VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL			
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
7:00 - 8:00													606	26	632	4	0	4	30	1	31				47	1	48	4	2	6	275	21	296				966	51	1017	
7:15 - 8:15													709	33	742	11	0	11	33	1	34				49	1	50	4	2	6	294	23	317				1100	60	1160	
7:30 - 8:30													**752**	**26**	**778**	**15**	**0**	**15**	**32**	**1**	**33**				**47**	**1**	**48**	**5**	**1**	**6**	**342**	**28**	**370**				**1193**	**57**	**1250**	**Peak**
7:45 - 8:45													716	29	745	16	0	16	34	0	34				42	1	43	6	0	6	368	32	400				1182	62	1244	
8:00 - 9:00													645	31	676	17	1	18	31	0	31				42	1	43	8	0	8	396	37	433				1139	70	1209	

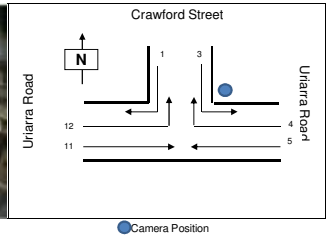
TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6			VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL			
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
16:00 - 17:00													422	19	441	34	1	35	18	0	18				16	0	16	31	0	31	936	17	953				1457	37	1494	
16:15 - 17:15													**430**	**16**	**432**	**26**	**1**	**27**	**15**	**0**	**15**				**17**	**0**	**17**	**35**	**0**	**35**	**873**	**24**	**897**				**1502**	**41**	**1543**	**Peak**
16:30 - 17:30													439	16	455	30	1	31	15	0	15				14	0	14	43	0	43	946	20	966				1487	37	1524	
16:45 - 17:45													431	13	444	41	1	42	17	0	17				19	0	19	42	0	42	926	18	944				1474	32	1506	
17:00 - 18:00													425	9	434	43	0	43	16	0	16				19	0	19	36	0	36	909	15	924				1448	24	1472	

Intersection of Uriarra Road and Crawford Street

Thursday, 5 May 2011

Austraffic

Survey Start	7:00 AM 16:00 PM
Intersection Type	T Junction
Intersection No.	6
North Approach	Crawford Street
East Approach	Uriarra Road
South Approach	
West Approach	Uriarra Road
Date	5/05/11
Classification	Light Heavy



Camera Position

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6			VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
7:00 - 7:15	21	1	22				4	0	4	10	1	11	74	4	78																61	6	67	17	0	17	187	12	199
7:15 - 7:30	13	0	13				7	0	7	11	1	12	97	9	106																57	3	60	11	1	12	196	14	210
7:30 - 7:45	15	0	15				11	1	12	17	1	18	126	12	138																77	5	82	11	0	11	257	19	276
7:45 - 8:00	14	1	15				5	0	5	24	0	24	160	1	161																91	5	96	17	0	17	311	7	318
8:00 - 8:15	17	0	17				5	1	6	35	0	35	165	11	176																82	10	92	15	0	15	319	22	341
8:15 - 8:30	16	0	16				11	0	11	32	1	33	132	3	135																102	9	111	6	1	7	299	14	313
8:30 - 8:45	22	0	22				8	1	9	18	1	19	106	13	119																101	6	107	7	1	8	262	22	284
8:45 - 9:00	15	0	15				3	0	3	21	1	22	112	6	118																122	7	129	6	0	6	279	14	293
Σ	133	2	135				54	3	57	168	6	174	972	59	1031																693	51	744	90	3	93	2110	124	2234

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6			VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
16:00 - 16:15	23	0	23				14	0	14	28	0	28	97	6	103																185	2	187	11	0	11	358	8	366
16:15 - 16:30	29	0	29				17	0	17	13	0	13	110	4	114																210	3	213	11	1	12	390	8	398
16:30 - 16:45	27	0	27				14	1	15	14	0	14	96	2	98																223	6	229	9	0	9	383	9	392
16:45 - 17:00	27	0	27				21	0	21	17	0	17	108	6	114																197	3	200	6	0	6	376	9	385
17:00 - 17:15	18	1	19				14	0	14	11	1	12	115	3	118																207	7	214	15	1	16	380	13	393
17:15 - 17:30	18	0	18				18	0	18	21	0	21	114	2	116																170	2	172	11	0	11	352	4	356
17:30 - 17:45	31	0	31				15	0	15	18	0	18	104	0	104																213	4	217	11	0	11	392	4	396
17:45 - 18:00	34	0	34				15	0	15	17	0	17	79	2	81																173	3	176	11	0	11	329	5	334
Σ	207	1	208				128	1	129	139	1	140	823	25	848																1578	30	1608	85	2	87	2960	60	3020

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6			VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL			
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
7:00 - 8:00	63	2	65				27	1	28	62	3	65	457	26	483																286	19	305	56	1	57	951	52	1003	
7:15 - 8:15	59	1	60				28	2	30	87	2	89	548	33	581																307	23	330	54	1	55	1083	62	1145	
7:30 - 8:30	62	1	63				32	2	34	108	2	110	583	27	610																352	29	381	49	1	50	1186	62	1248	
7:45 - 8:45	**69**	**1**	**70**				**29**	**2**	**31**	**109**	**2**	**111**	**563**	**28**	**591**																**376**	**30**	**406**	**45**	**2**	**47**	**1191**	**65**	**1256**	**Peak**
8:00 - 9:00	70	0	70				27	2	29	106	3	109	515	33	548																407	32	439	34	2	36	1159	72	1231	

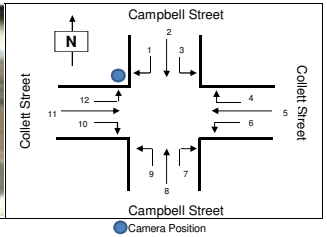
TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6			VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL			
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
16:00 - 17:00	106	0	106				66	1	67	72	0	72	411	18	429																815	14	829	37	1	38	1507	34	1541	
16:15 - 17:15	**101**	**1**	**102**				**56**	**1**	**57**	**55**	**1**	**56**	**429**	**15**	**444**																**827**	**19**	**846**	**41**	**2**	**43**	**1529**	**39**	**1568**	**Peak**
16:30 - 17:30	90	1	91				67	1	68	63	1	64	433	13	446																797	18	815	41	1	42	1491	35	1526	
16:45 - 17:45	94	1	95				68	0	68	67	1	68	441	11	452																787	16	803	43	1	44	1500	30	1530	
17:00 - 18:00	101	1	102				62	0	62	67	1	68	412	7	419																763	16	779	48	1	49	1453	26	1479	

Intersection of Campbell Street and Collett Street

Thursday, 5 May 2011

Austraffic

Survey Start	7:00 AM 16:00 PM
Intersection Type	Cross Junction
Intersection No.	7
North Approach	Campbell Street
East Approach	Collett Street
South Approach	Campbell Street
West Approach	Collett Street
Date	5/05/11
Classification	Light Heavy



Camera Position

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
7:00 - 7:15	0	1	1	8	0	8	9	0	9	14	0	14	6	0	6	1	1	2
7:15 - 7:30	0	0	0	4	0	4	10	0	10	27	0	27	6	0	6	1	0	1
7:30 - 7:45	0	0	0	7	0	7	13	0	13	22	0	22	6	0	6	0	0	0
7:45 - 8:00	0	0	0	4	0	4	18	1	19	22	0	22	8	1	9	2	0	2
8:00 - 8:15	0	0	0	9	0	9	20	1	21	34	0	34	5	0	5	1	0	1
8:15 - 8:30	0	0	0	8	1	9	12	0	12	36	0	36	11	0	11	2	0	2
8:30 - 8:45	0	0	0	10	0	10	24	2	26	25	0	25	8	0	8	3	0	3
8:45 - 9:00	0	0	0	15	0	15	27	1	28	28	0	28	9	0	9	3	0	3
Σ	0	1	1	65	1	66	133	5	138	208	0	208	59	1	60	13	1	14

TIME PERIOD	VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
7:00 - 7:15	0	0	0	1	0	1	0	0	0	1	0	1	0	0	0	0	0	0	40	2	42
7:15 - 7:30	0	0	0	0	0	0	0	0	0	1	1	2	1	0	1	0	0	0	50	1	51
7:30 - 7:45	1	0	1	1	0	1	0	1	1	1	0	1	2	0	2	0	0	0	53	1	54
7:45 - 8:00	2	0	2	0	0	0	0	0	0	1	0	1	3	0	3	0	0	0	60	2	62
8:00 - 8:15	1	0	1	2	0	2	0	0	0	1	0	1	3	0	3	0	0	0	76	1	77
8:15 - 8:30	1	0	1	1	0	1	2	0	2	0	0	0	2	1	3	0	0	0	75	2	77
8:30 - 8:45	3	0	3	0	1	1	2	1	3	0	1	1	3	0	3	0	0	0	78	5	83
8:45 - 9:00	2	0	2	1	0	1	2	0	2	0	0	0	1	0	1	0	0	0	88	1	89
Σ	10	0	10	6	1	7	4	2	6	6	2	8	16	1	17	0	0	0	520	15	535

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
16:00 - 16:15	1	0	1	25	1	26	34	0	34	23	0	23	14	0	14	3	0	3
16:15 - 16:30	0	0	0	27	0	27	43	0	43	31	0	31	22	0	22	2	0	2
16:30 - 16:45	0	0	0	41	1	42	40	2	42	30	2	32	20	0	20	7	0	7
16:45 - 17:00	0	0	0	26	2	28	47	0	47	27	0	27	19	1	20	5	0	5
17:00 - 17:15	0	0	0	29	1	30	50	1	51	42	0	42	11	0	11	2	0	2
17:15 - 17:30	0	0	0	44	0	44	51	0	51	33	0	33	22	0	22	2	0	2
17:30 - 17:45	2	0	2	43	1	44	61	0	61	37	0	37	11	0	11	3	0	3
17:45 - 18:00	1	0	1	37	0	37	34	0	34	34	0	34	18	0	18	2	0	2
Σ	4	0	4	272	6	278	360	3	363	257	2	259	137	1	138	26	0	26

TIME PERIOD	VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
16:00 - 16:15	1	0	1	0	0	0	2	0	2	0	0	0	1	0	1	0	0	0	104	1	105
16:15 - 16:30	1	0	1	1	0	1	1	0	1	0	0	0	5	0	5	2	0	2	135	0	135
16:30 - 16:45	3	0	3	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	143	5	148
16:45 - 17:00	2	0	2	0	0	0	0	0	0	1	0	1	2	0	2	1	0	1	130	3	133
17:00 - 17:15	4	0	4	3	0	3	0	0	0	0	0	0	4	0	4	0	0	0	145	2	147
17:15 - 17:30	1	0	1	0	0	0	0	0	0	2	0	2	4	0	4	0	0	0	159	0	159
17:30 - 17:45	2	0	2	1	0	1	2	0	2	1	0	1	6	0	6	0	0	0	169	1	170
17:45 - 18:00	1	0	1	0	0	0	0	0	0	1	0	1	4	0	4	0	0	0	132	0	132
Σ	15	0	15	5	0	5	5	0	5	5	0	5	28	0	28	3	0	3	1117	12	1129

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
7:00 - 8:00	0	1	1	23	0	23	50	1	51	85	0	85	26	1	27	4	1	5
7:15 - 8:15	0	0	0	24	0	24	61	2	63	105	0	105	25	1	26	4	0	4
7:30 - 8:30	0	0	0	28	1	29	63	2	65	114	0	114	30	1	31	5	0	5
7:45 - 8:45	0	0	0	31	1	32	74	4	78	117	0	117	32	1	33	8	0	8
8:00 - 9:00	**0**	**0**	**0**	**42**	**1**	**43**	**83**	**4**	**87**	**123**	**0**	**123**	**33**	**0**	**33**	**9**	**0**	**9**

TIME PERIOD	VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL			
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
7:00 - 8:00	3	0	3	2	0	2	0	1	1	4	1	5	6	0	6	0	0	0	203	6	209	
7:15 - 8:15	4	0	4	3	0	3	0	1	1	4	1	5	9	0	9	0	0	0	239	5	244	
7:30 - 8:30	5	0	5	4	0	4	2	1	3	3	0	3	10	1	11	0	0	0	264	6	270	
7:45 - 8:45	7	0	7	3	1	4	4	1	5	2	1	3	11	1	12	0	0	0	289	10	299	
8:00 - 9:00	**7**	**0**	**7**	**4**	**1**	**5**	**4**	**1**	**5**	**2**	**1**	**3**	**10**	**1**	**11**	**0**	**0**	**0**	**317**	**9**	**326**	**Peak**

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
16:00 - 17:00	1	0	1	119	4	123	164	2	166	111	2	113	75	1	76	17	0	17
16:15 - 17:15	0	0	0	123	4	127	180	3	183	130	2	132	72	1	73	16	0	16
16:30 - 17:30	3	0	3	140	4	144	188	3	191	132	2	134	72	1	73	16	0	16
16:45 - 17:45	**5**	**0**	**5**	**142**	**4**	**146**	**205**	**5**	**210**	**130**	**0**	**130**	**63**	**1**	**64**	**12**	**0**	**12**
17:00 - 18:00	3	0	3	153	2	155	196	1	197	146	0	146	62	0	62	9	0	9

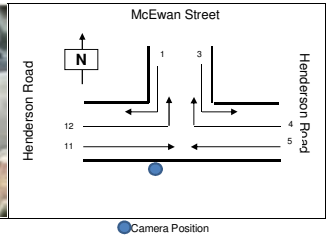
TIME PERIOD	VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL			
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
16:00 - 17:00	7	0	7	1	0	1	3	0	3	1	0	1	10	0	10	3	0	3	512	9	521	
16:15 - 17:15	10	0	10	4	0	4	1	0	1	1	0	1	13	0	13	3	0	3	553	10	563	
16:30 - 17:30	12	0	12	4	0	4	2	0	2	1	0	1	12	0	12	2	0	2	577	0	587	
16:45 - 17:45	**13**	**0**	**13**	**4**	**0**	**4**	**2**	**0**	**2**	**1**	**0**	**1**	**16**	**0**	**16**	**1**	**0**	**1**	**600**	**6**	**606**	**Peak**
17:00 - 18:00	8	0	8	4	0	4	2	0	2	4	0	4	18	0	18	0	0	0	605	3	608	

Intersection of Henderson Road and McEwan Street

Thursday, 5 May 2011

Austraffic

Survey Start	7:00	AM	16:00 PM
Intersection Type	T Junction		
Intersection No.	8		
North Approach	McEwan Street		
East Approach	Henderson Road		
South Approach			
West Approach	Henderson Road		
Date	5/05/11		
Classification	Light	Heavy	



TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6			VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
7:00 - 7:15	9	0	9				14	0	14	15	0	15	2	0	2																3	0	3	38	1	39	81	1	82
7:15 - 7:30	4	0	4				4	0	4	16	0	16	7	0	7																11	0	11	31	1	32	73	1	74
7:30 - 7:45	3	1	4				12	0	12	19	0	19	8	0	8																8	0	8	48	1	49	98	2	100
7:45 - 8:00	3	1	4				12	1	13	19	0	19	6	0	6																11	0	11	60	2	62	111	4	115
8:00 - 8:15	4	1	5				16	1	17	29	0	29	5	0	5																12	0	12	68	0	68	134	2	136
8:15 - 8:30	4	0	4				12	1	13	31	0	31	7	0	7																12	0	12	76	0	76	142	1	143
8:30 - 8:45	11	0	11				26	1	27	23	0	23	7	0	7																7	1	8	41	1	42	115	3	118
8:45 - 9:00	7	0	7				29	1	30	19	0	19	8	0	8																13	0	13	37	1	38	113	2	115
Σ	45	3	48				125	5	130	171	0	171	50	0	50																77	1	78	399	7	406	867	16	883

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6			VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL		
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ
16:00 - 16:15	29	0	29				53	1	54	10	0	10	12	0	12																7	0	7	25	0	25	136	1	137
16:15 - 16:30	22	0	22				60	0	60	17	0	17	15	0	15																8	0	8	20	1	21	142	1	143
16:30 - 16:45	23	1	24				60	3	63	9	1	10	13	1	14																14	0	14	19	0	19	138	6	144
16:45 - 17:00	29	1	30				63	2	65	11	0	11	18	0	18																10	0	10	25	0	25	156	3	159
17:00 - 17:15	21	2	23				68	0	68	11	0	11	20	0	20																8	2	10	10	1	11	138	5	143
17:15 - 17:30	31	0	31				78	1	79	19	0	19	12	0	12																11	0	11	21	0	21	172	1	173
17:30 - 17:45	37	0	37				100	0	100	15	0	15	22	0	22																7	0	7	16	0	16	197	0	197
17:45 - 18:00	30	0	30				55	0	55	10	0	10	22	0	22																12	0	12	18	0	18	147	0	147
Σ	222	4	226				537	7	544	102	1	103	134	1	135																77	2	79	154	2	156	1226	17	1243

TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6			VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL			
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
7:00 - 8:00	19	2	21				42	1	43	69	0	69	23	0	23																33	0	33	177	5	182	363	8	371	
7:15 - 8:15	14	3	17				44	2	46	83	0	83	26	0	26																42	0	42	207	4	211	416	9	425	
7:30 - 8:30	14	3	17				52	3	55	98	0	98	26	0	26																43	0	43	252	3	255	485	9	494	
7:45 - 8:45	**22**	**2**	**24**				**66**	**4**	**70**	**102**	**0**	**102**	**25**	**0**	**25**																**42**	**1**	**43**	**245**	**3**	**248**	**502**	**10**	**512**	**Peak**
8:00 - 9:00	**26**	**1**	**27**				**83**	**4**	**87**	**102**	**0**	**102**	**27**	**0**	**27**																**44**	**1**	**45**	**222**	**2**	**224**	**504**	**8**	**512**	**Peak**

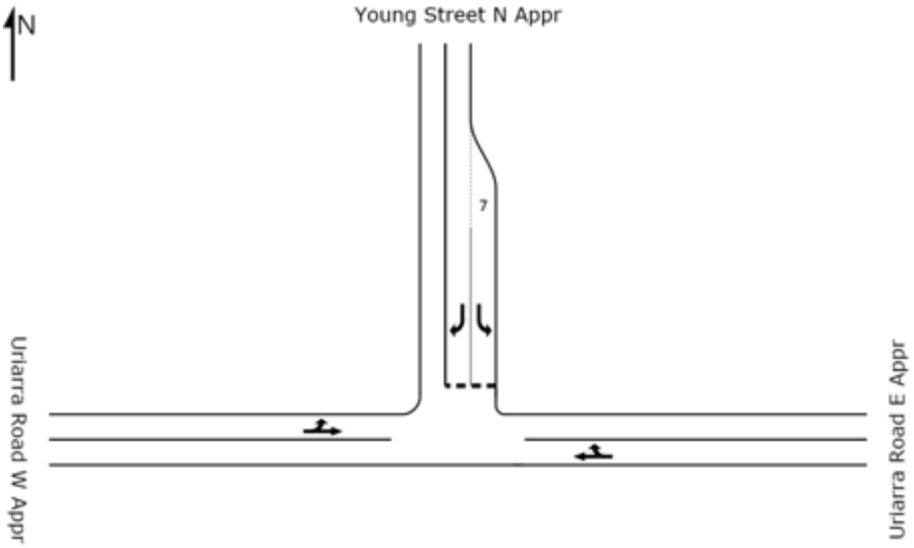
TIME PERIOD	VEHICLE MOVEMENT 1			2			3			4			5			6			VEHICLE MOVEMENT 7			8			9			10			11			12			GRAND TOTAL			
	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	Light	Heavy	Σ	
16:00 - 17:00	103	2	105				236	6	242	47	1	48	58	1	59																39	0	39	89	1	90	572	11	583	
16:15 - 17:15	95	4	99				251	5	256	48	1	49	66	1	67																40	2	42	74	2	76	574	15	589	
16:30 - 17:30	104	4	108				269	6	275	50	1	51	63	1	64																43	2	45	75	1	76	604	15	619	
16:45 - 17:45	**118**	**3**	**121**				**302**	**3**	**305**	**56**	**0**	**56**	**72**	**0**	**72**																**36**	**2**	**38**	**72**	**1**	**73**	**652**	**9**	**672**	**Peak**
17:00 - 18:00	119	2	121				301	1	302	55	0	55	76	0	76																38	2	40	65	1	66	654	6	660	

draft

Appendix C

Existing Operational Assessment SIDRA Results

Uriarra Road / Young Street



LANE SUMMARY

Site: Uriarra Road / Young Street Existing Weekday AM

JS10760
Uriarra Road / Young Street
Existing Weekday AM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Uriarra Road E Appr																
Lane 1	0	1061	5	1067	3.0	1903	0.561	100	5.6	LOS A	12.2	87.5	500	–	0.0	0.0
Approach	0	1061	5	1067	3.0		0.561		5.6	NA	12.2	87.5				
North: Young Street N Appr																
Lane 1	13	0	0	13	8.3	355[1]	0.036	100	9.6	LOS A	0.1	0.4	7	Turn Bay	0.0	0.0
Lane 2	0	0	55	55	0.0	94	0.583	100	58.2	LOS E	1.8	12.8	500	–	0.0	0.0
Approach	13	0	55	68	1.6		0.583		48.9	LOS D	1.8	12.8				
West: Uriarra Road W Appr																
Lane 1	27	349	0	376	8.6	1840	0.205	100	0.5	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	27	349	0	376	8.6		0.205		0.5	NA	0.0	0.0				
Intersection				1511	4.3		0.583		6.3	NA	12.2	87.5				

LANE SUMMARY

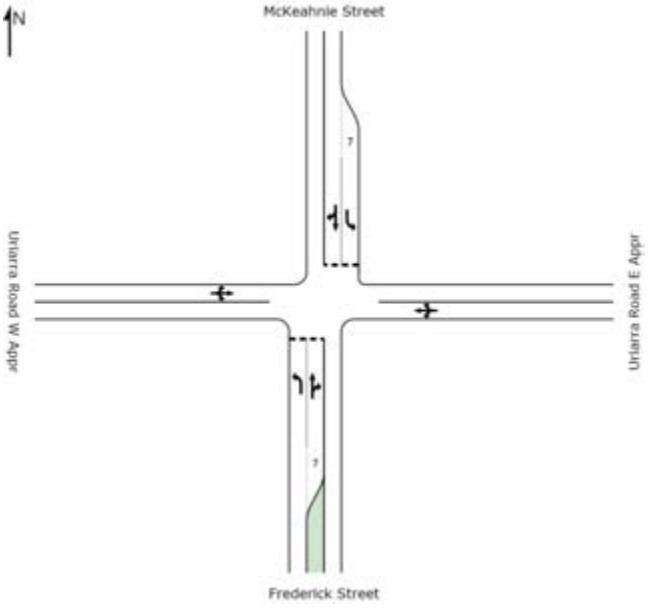
Site: Uriarra Road / Young Street Existing Weekday PM

JS10760
Uriarra Road / Young Street
Existing Weekday PM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Uriarra Road E Appr																
Lane 1	0	447	7	454	3.4	1700	0.267	100	23.8	LOS B	8.0	57.3	500	–	0.0	0.0
Approach	0	447	7	454	3.4		0.267		23.8	NA	8.0	57.3				
North: Young Street N Appr																
Lane 1	10	0	0	10	0.0	128[1]	0.079	100	27.1	LOS B	0.2	1.2	7	Turn Bay	0.0	0.0
Lane 2	0	0	24	24	4.2	67	0.368	100	65.5	LOS E	1.0	7.2	500	–	0.0	0.0
Approach	10	0	24	35	2.9		0.368		54.2	LOS D	1.0	7.2				
West: Uriarra Road W Appr																
Lane 1	63	1083	0	1146	2.4	1914	0.599	100	0.4	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	63	1083	0	1146	2.4		0.599		0.4	NA	0.0	0.0				
Intersection				1635	2.7		0.599		8.0	NA	8.0	57.3				

Uriarra Road / Frederick Street / McKeahnie Street



LANE SUMMARY

Site: Uriarra Road / Frederick Street / McKeahnie Street Existing Weekday AM

JS10760
Uriarra Road / Frederick Street / McKeahnie Street
Existing Weekday AM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Frederick Street																
Lane 1	56	0	0	56	1.9	256	0.218	100	21.0	LOS B	0.7	5.0	500	–	0.0	0.0
Lane 2	0	1	11	12	0.0	63[1]	0.189	100	54.8	LOS D	0.5	3.2	7	Turn Bay	0.0	0.0
Approach	56	1	11	68	1.6		0.218		26.9	LOS B	0.7	5.0				
East: Uriarra Road E Appr																
Lane 1	24	949	2	975	3.4	1901	0.513	100	4.8	LOS A	9.6	69.4	500	–	0.0	0.0
Approach	24	949	2	975	3.4		0.513		4.8	NA	9.6	69.4				
North: McKeahnie Street																
Lane 1	9	0	0	9	0.0	389[1]	0.022	100	9.2	LOS A	0.0	0.3	7	Turn Bay	0.0	0.0
Lane 2	0	1	41	42	0.0	72	0.580	100	85.9	LOS F	2.1	14.4	500	–	0.0	0.0
Approach	9	1	41	51	0.0		0.580		72.9	LOS F	2.1	14.4				
West: Uriarra Road W Appr																
Lane 1	5	358	1	365	8.8	1819	0.200	100	12.4	LOS A	4.1	30.7	500	–	0.0	0.0
Approach	5	358	1	365	8.8		0.200		12.4	NA	4.1	30.7				
Intersection				1458	4.6		0.580		10.1	NA	9.6	69.4				

LANE SUMMARY

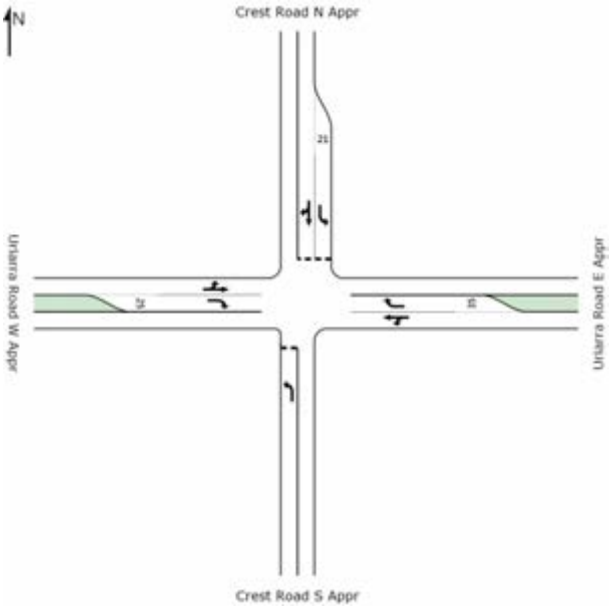
Site: Uriarra Road / Frederick Street / McKeahnie Street Existing Weekday PM

JS10760
Uriarra Road / Frederick Street / McKeahnie Street
Existing Weekday PM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Frederick Street																
Lane 1	9	0	0	9	0.0	710	0.013	100	9.7	LOS A	0.0	0.3	500	–	0.0	0.0
Lane 2	0	1	6	7	0.0	49	0.145	100	78.1	LOS F	0.4	2.8	7	Turn Bay	0.0	0.0
Approach	9	1	6	16	0.0		0.145		39.7	LOS C	0.4	2.8				
East: Uriarra Road E Appr																
Lane 1	19	432	1	452	3.6	1875	0.241	100	18.6	LOS B	6.7	48.4	500	–	0.0	0.0
Approach	19	432	1	452	3.6		0.241		18.6	NA	6.7	48.4				
North: McKeahnie Street																
Lane 1	9	0	0	9	0.0	144[1]	0.064	100	24.2	LOS B	0.1	1.0	7	Turn Bay	0.0	0.0
Lane 2	0	1	9	10	0.0	50	0.205	100	83.1	LOS F	0.6	4.1	500	–	0.0	0.0
Approach	9	1	9	19	0.0		0.205		55.2	LOS D	0.6	4.1				
West: Uriarra Road W Appr																
Lane 1	20	1058	10	1089	2.4	1897	0.574	100	7.2	LOS A	13.9	99.0	500	–	0.0	0.0
Approach	20	1058	10	1089	2.4		0.574		7.2	NA	13.9	99.0				
Intersection				1577	2.7		0.574		11.4	NA	13.9	99.0				

Uriarra Road / Crest Road



LANE SUMMARY

Site: Uriarra Road / Crest Road Existing Weekday AM

JS10760
Uriarra Road / Crest Road
Existing Weekday AM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Crest Road S Appr																
Lane 1	31	0	0	31	0.0	315	0.098	100	17.1	LOS B	0.3	2.1	500	–	0.0	0.0
Approach	31	0	0	31	0.0		0.098		17.1	LOS B	0.3	2.1				
East: Uriarra Road E Appr																
Lane 1	12	873	0	885	3.5	1906	0.464	100	0.1	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	10	10	0.0	953	0.010	100	9.3	LOS A	0.0	0.3	35	Turn Bay	0.0	0.0
Approach	12	873	10	895	3.4		0.464		0.2	NA	0.0	0.3				
North: Crest Road N Appr																
Lane 1	15	0	0	15	0.0	705[1]	0.021	100	9.3	LOS A	0.1	0.5	21	Turn Bay	0.0	0.0
Lane 2	0	1	50	51	2.1	87	0.590	100	74.1	LOS F	2.2	15.7	500	–	0.0	0.0
Approach	15	1	50	66	1.6		0.590		59.4	LOS E	2.2	15.7				
West: Uriarra Road W Appr																
Lane 1	7	369	0	377	8.2	1850	0.204	100	0.1	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	7	7	0.0	423	0.018	100	14.7	LOS B	0.1	0.4	25	Turn Bay	0.0	0.0
Approach	7	369	7	384	8.0		0.204		0.4	NA	0.1	0.4				
Intersection				1376	4.6		0.590		3.5	NA	2.2	15.7				

LANE SUMMARY

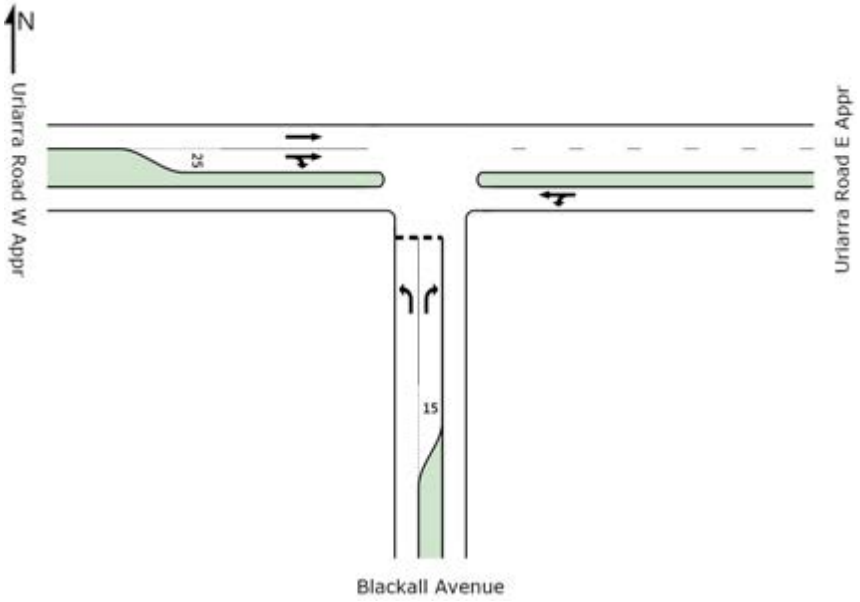
Site: Uriarra Road / Crest Road Existing Weekday PM

JS10760
Uriarra Road / Crest Road
Existing Weekday PM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows L veh/h	T veh/h	R veh/h	Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Lane Length m	SL Type	Cap. Adj. %	Prob. Block. %
South: Crest Road S Appr																
Lane 1	11	0	0	11	0.0	713	0.016	100	9.7	LOS A	0.1	0.4	500	–	0.0	0.0
Approach	11	0	0	11	0.0		0.016		9.7	LOS A	0.1	0.4				
East: Uriarra Road E Appr																
Lane 1	14	432	0	446	3.5	1904	0.234	100	0.2	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	26	26	0.0	270	0.096	100	20.0	LOS B	0.3	2.1	35	Turn Bay	0.0	0.0
Approach	14	432	26	472	3.3		0.234		1.3	NA	0.3	2.1				
North: Crest Road N Appr																
Lane 1	20	0	0	20	0.0	193	0.102	100	24.2	LOS B	0.3	2.1	21	Turn Bay	0.0	0.0
Lane 2	0	1	19	20	0.0	48	0.414	100	104.8	LOS F	1.3	8.8	500	–	0.0	0.0
Approach	20	1	19	40	0.0		0.414		64.5	LOS E	1.3	8.8				
West: Uriarra Road W Appr																
Lane 1	22	1050	0	1072	2.5	1917	0.559	100	0.2	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	21	21	5.0	880	0.024	100	10.0	LOS A	0.1	0.6	25	Turn Bay	0.0	0.0
Approach	22	1050	21	1093	2.6		0.559		0.3	NA	0.1	0.6				
Intersection				1616	2.7		0.559		2.3	NA	1.3	8.8				

Uriarra Road / Blackall Avenue



LANE SUMMARY

Site: Uriarra Road / Blackall Avenue Existing Weekday AM

JS10760
Uriarra Road / Blackall Ave
Existing Weekday AM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Blackall Avenue																
Lane 1	51	0	0	51	2.1	348	0.147	100	16.2	LOS B	0.5	3.3	500	–	0.0	0.0
Lane 2	0	0	35	35	3.0	98	0.358	100	53.0	LOS D	1.2	8.7	15	Turn Bay	0.0	0.0
Approach	51	0	35	86	2.5		0.358		31.2	LOS C	1.2	8.7				
East: Uriarra Road E Appr																
Lane 1	16	828	0	844	3.3	1908	0.442	100	0.1	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	16	828	0	844	3.3		0.442		0.1	NA	0.0	0.0				
West: Uriarra Road W Appr																
Lane 1	0	370	0	370	7.6	1859	0.199	100	0.0	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	24	6	30	9.5	983	0.031	16[7]	10.8	LOS A	0.3	2.2	25	Turn Bay	0.0	0.0
Approach	0	394	6	400	7.7		0.199		0.8	NA	0.3	2.2				
Intersection				1330	4.6		0.442		2.4	NA	1.2	8.7				

LANE SUMMARY

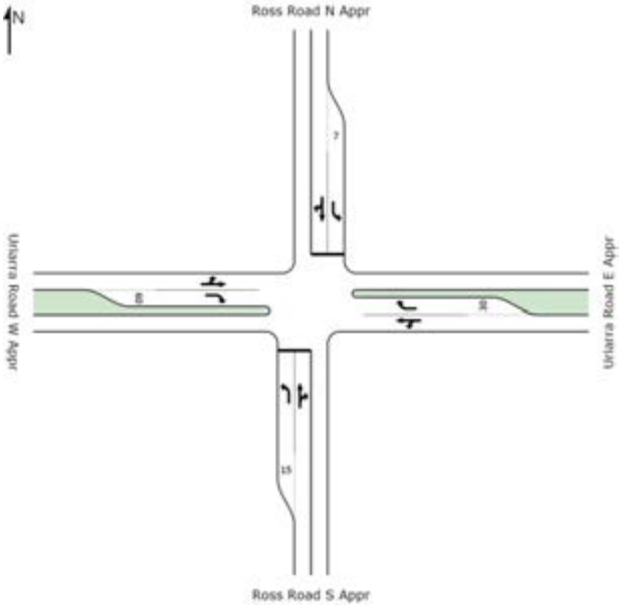
Site: Uriarra Road / Blackall Avenue Existing Weekday PM

JS10760
Uriarra Road / Blackall Ave
Existing Weekday PM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Blackall Avenue																
Lane 1	17	0	0	17	0.0	676	0.026	100	10.1	LOS A	0.1	0.6	500	–	0.0	0.0
Lane 2	0	0	15	15	0.0	50	0.306	100	91.3	LOS F	0.9	6.3	15	Turn Bay	0.0	0.0
Approach	17	0	15	33	0.0		0.306		48.2	LOS D	0.9	6.3				
East: Uriarra Road E Appr																
Lane 1	28	461	0	489	3.5	1900	0.257	100	0.4	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	28	461	0	489	3.5		0.257		0.4	NA	0.0	0.0				
West: Uriarra Road W Appr																
Lane 1	0	959	0	959	2.4	1920	0.500	100	0.0	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	58	36	94	1.5	1284	0.073	15[7]	5.5	LOS A	0.4	3.0	25	Turn Bay	0.0	0.0
Approach	0	1017	36	1053	2.3		0.500		0.5	NA	0.4	3.0				
Intersection				1574	2.7		0.500		1.5	NA	0.9	6.3				

Uriarra Road / Ross Road



LANE SUMMARY

Site: Uriarra Road / Ross Road Existing Weekday AM

JS10760
Uriarra Road / Ross Road
Existing Weekday AM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Ross Road S Appr																
Lane 1	92	0	0	92	1.1	397	0.231	100	18.4	LOS B	0.8	5.8	15	Turn Bay	0.0	0.0
Lane 2	0	61	13	74	1.4	124	0.592	100	58.0	LOS E	2.5	17.6	500	–	0.0	0.0
Approach	92	61	13	165	1.3		0.592		36.1	LOS C	2.5	17.6				
East: Uriarra Road E Appr																
Lane 1	35	758	0	793	3.5	1902	0.417	100	0.3	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	8	8	0.0	917	0.008	100	9.4	LOS A	0.0	0.2	30	Turn Bay	0.0	0.0
Approach	35	758	8	800	3.5		0.417		0.4	NA	0.0	0.2				
North: Ross Road N Appr																
Lane 1	12	0	0	12	9.1	339[1]	0.035	100	13.0	LOS A	0.1	0.4	7	Turn Bay	0.0	0.0
Lane 2	0	12	4	16	6.6	102	0.155	100	45.6	LOS D	0.5	3.6	500	–	0.0	0.0
Approach	12	12	4	28	7.7		0.155		31.7	LOS C	0.5	3.6				
West: Uriarra Road W Appr																
Lane 1	14	394	0	408	7.7	1854	0.220	100	0.3	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	24	24	0.0	510	0.047	100	13.2	LOS A	0.2	1.1	60	Turn Bay	0.0	0.0
Approach	14	394	24	432	7.2		0.220		1.0	NA	0.2	1.1				
Intersection				1425	4.4		0.592		5.3	NA	2.5	17.6				

LANE SUMMARY

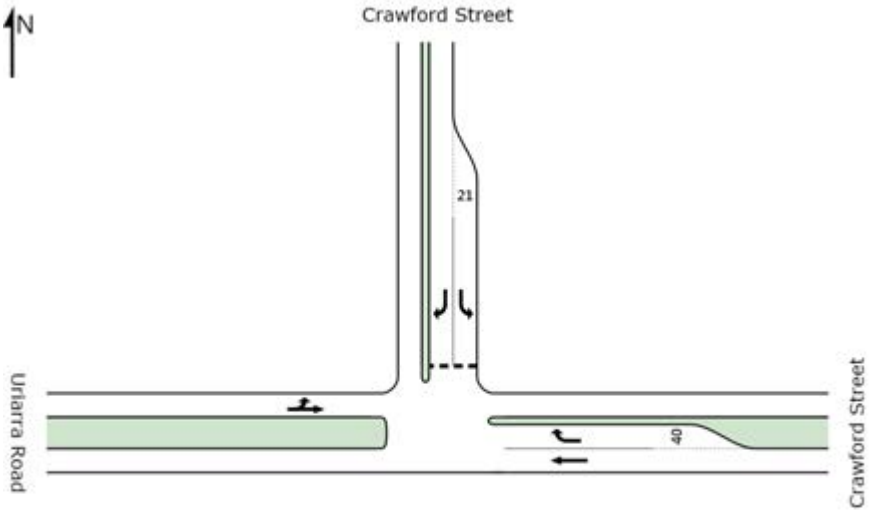
Site: Uriarra Road / Ross Road Existing Weekday PM

JS10760
Uriarra Road / Ross Road
Existing Weekday PM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Ross Road S Appr																
Lane 1	36	0	0	36	2.9	564[1]	0.063	100	13.2	LOS A	0.2	1.3	15	Turn Bay	0.0	0.0
Lane 2	0	18	30	48	0.0	71	0.673	100	96.5	LOS F	2.4	16.8	500	–	0.0	0.0
Approach	36	18	30	84	1.2		0.673		61.0	LOS E	2.4	16.8				
East: Uriarra Road E Appr																
Lane 1	50	449	0	499	3.3	1900	0.263	100	0.7	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	11	11	0.0	345	0.032	100	16.6	LOS B	0.1	0.7	30	Turn Bay	0.0	0.0
Approach	50	449	11	510	3.2		0.263		1.1	NA	0.1	0.7				
North: Ross Road N Appr																
Lane 1	15	0	0	15	6.7	164[1]	0.093	100	23.6	LOS B	0.2	1.4	7	Turn Bay	0.0	0.0
Lane 2	0	22	5	28	0.0	82	0.336	100	61.4	LOS E	1.0	7.3	500	–	0.0	0.0
Approach	15	22	5	43	2.4		0.336		47.9	LOS D	1.0	7.3				
West: Uriarra Road W Appr																
Lane 1	16	959	0	976	2.3	1920	0.508	100	0.1	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	59	59	3.4	823	0.072	100	10.2	LOS A	0.3	1.9	60	Turn Bay	0.0	0.0
Approach	16	959	59	1035	2.4		0.508		0.7	NA	0.3	1.9				
Intersection				1671	2.6		0.673		5.0	NA	2.4	16.8				

Uriarra Road / Crawford Street



LANE SUMMARY

Site: Uriarra Road / Crawford Street Existing Weekday AM

JS10760
Uriarra Road / Crawford Street
Existing Weekday AM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows L	T	R	Total	HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Lane Length	SL Type	Cap. Adj.	Prob. Block.
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Crawford Street																
Lane 1	0	642	0	642	4.4	1895	0.339	100	0.0	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	116	116	1.8	865	0.134	100	10.0	LOS A	0.5	3.7	40	Turn Bay	0.0	0.0
Approach	0	642	116	758	4.0		0.339		1.5	NA	0.5	3.7				
North: Crawford Street																
Lane 1	36	0	0	36	5.9	703	0.051	100	10.1	LOS A	0.2	1.3	21	Turn Bay	0.0	0.0
Lane 2	0	0	66	66	1.6	160	0.414	100	33.8	LOS C	1.4	10.1	500	–	0.0	0.0
Approach	36	0	66	102	3.1		0.414		25.5	LOS B	1.4	10.1				
West: Uriarra Road																
Lane 1	53	401	0	454	7.0	1855	0.245	100	0.9	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	53	401	0	454	7.0		0.245		0.9	NA	0.0	0.0				
Intersection				1314	5.0		0.414		3.2	NA	1.4	10.1				

LANE SUMMARY

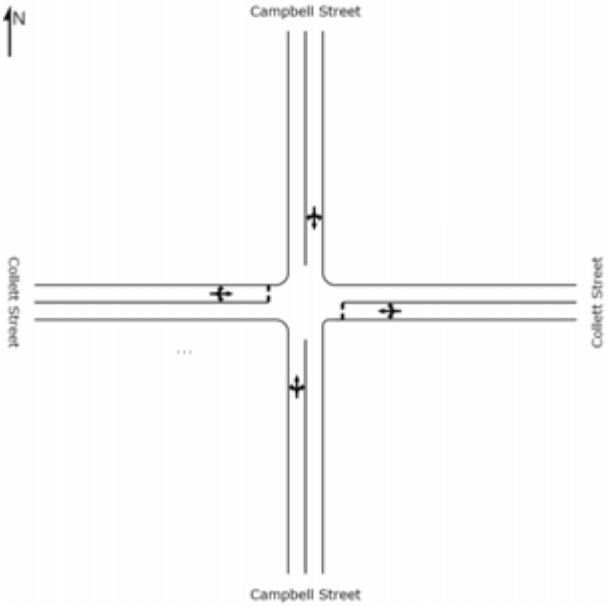
Site: Uriarra Road / Crawford Street Existing Weekday PM

JS10760
Uriarra Road / Crawford Street
Existing Weekday PM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Crawford Street																
Lane 1	0	448	0	448	3.4	1908	0.235	100	0.0	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	57	57	1.8	403	0.140	100	15.6	LOS B	0.5	3.3	40	Turn Bay	0.0	0.0
Approach	0	448	57	505	3.2		0.235		1.7	NA	0.5	3.3				
North: Crawford Street																
Lane 1	68	0	0	68	1.5	310	0.219	100	18.3	LOS B	0.7	5.2	21	Turn Bay	0.0	0.0
Lane 2	0	0	103	103	1.0	138	0.744	100	51.5	LOS D	3.0	21.4	500	–	0.0	0.0
Approach	68	0	103	171	1.2		0.744		38.3	LOS C	3.0	21.4				
West: Uriarra Road																
Lane 1	43	865	0	908	2.3	1916	0.474	100	0.4	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	43	865	0	908	2.3		0.474		0.4	NA	0.0	0.0				
Intersection				1584	2.5		0.744		4.9	NA	3.0	21.4				

Campbell Street / Collett Street



LANE SUMMARY

Site: Campbell Street / Collett Street Existing Weekday AM

JS10760
Campbell Street / Collett Street
Existing Weekday AM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows L	T	R	Total	HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Lane Length	SL Type	Cap. Adj.	Prob. Block.
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Campbell Street																
Lane 1	5	5	7	18	11.8	1477	0.012	100	5.3	LOS A	0.1	0.4	500	–	0.0	0.0
Approach	5	5	7	18	11.8		0.012		5.3	NA	0.1	0.4				
East: Collett Street																
Lane 1	9	35	129	174	0.0	797	0.218	100	7.6	LOS A	1.0	6.9	500	–	0.0	0.0
Approach	9	35	129	174	0.0		0.218		7.6	LOS A	1.0	6.9				
North: Campbell Street																
Lane 1	92	45	1	138	3.8	1833	0.075	100	4.4	LOS A	0.4	2.9	500	–	0.0	0.0
Approach	92	45	1	138	3.8		0.075		4.4	NA	0.4	2.9				
West: Collett Street																
Lane 1	1	12	3	16	13.3	753	0.021	100	7.1	LOS A	0.1	0.6	500	–	0.0	0.0
Approach	1	12	3	16	13.3		0.021		7.1	LOS A	0.1	0.6				
Intersection				345	2.7		0.218		6.2	NA	1.0	6.9				

LANE SUMMARY

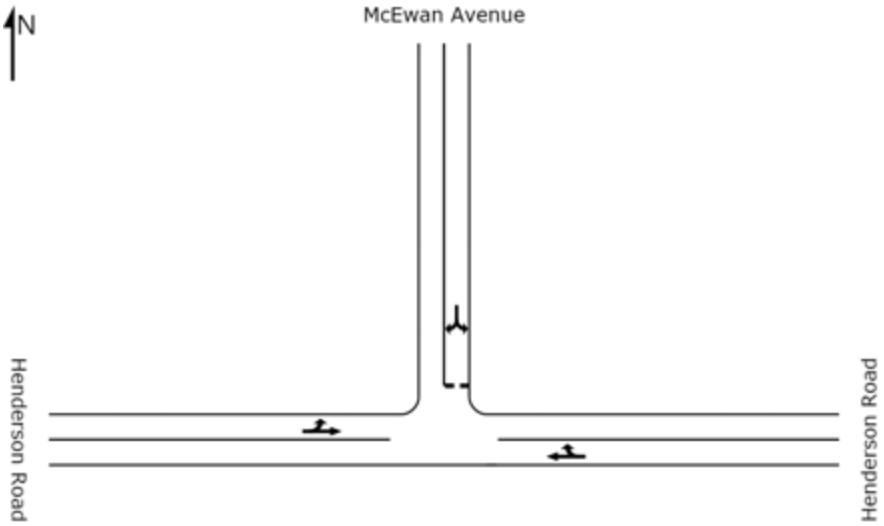
Site: Campbell Street / Collett Street Existing Weekday PM

JS10760
Campbell Street / Collett Street
Existing Weekday PM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows L	T	R	Total	HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Lane Length	SL Type	Cap. Adj.	Prob. Block.
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Campbell Street																
Lane 1	2	4	10	16	0.0	1199	0.013	100	6.6	LOS A	0.1	0.4	500	–	0.0	0.0
Approach	2	4	10	16	0.0		0.013		6.6	NA	0.1	0.4				
East: Collett Street																
Lane 1	13	69	149	231	0.5	614	0.376	100	10.8	LOS A	2.1	15.0	500	–	0.0	0.0
Approach	13	69	149	231	0.5		0.376		10.8	LOS A	2.1	15.0				
North: Campbell Street																
Lane 1	226	157	2	385	1.4	1874	0.205	100	3.8	LOS A	1.3	9.0	500	–	0.0	0.0
Approach	226	157	2	385	1.4		0.205		3.8	NA	1.3	9.0				
West: Collett Street																
Lane 1	1	17	4	23	0.0	594	0.038	100	8.9	LOS A	0.1	1.0	500	–	0.0	0.0
Approach	1	17	4	23	0.0		0.038		8.9	LOS A	0.1	1.0				
Intersection				655	1.0		0.376		6.5	NA	2.1	15.0				

Henderson Road / McEwan Avenue



LANE SUMMARY

Site: Henderson Road / McEwan Avenue Existing Weekday AM

JS10760
Henderson Road / McEwan Avenue
Existing Weekday AM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Henderson Road																
Lane 1	0	29	111	140	0.0	1181	0.119	100	6.7	LOS A	0.5	3.8	500	–	0.0	0.0
Approach	0	29	111	140	0.0		0.119		6.7	NA	0.5	3.8				
North: McEwan Avenue																
Lane 1	95	0	29	124	4.4	844	0.147	100	8.2	LOS A	0.6	4.2	500	–	0.0	0.0
Approach	95	0	29	124	4.4		0.147		8.2	LOS A	0.6	4.2				
West: Henderson Road																
Lane 1	243	49	0	292	1.1	1858	0.157	100	5.4	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	243	49	0	292	1.1		0.157		5.4	NA	0.0	0.0				
Intersection				557	1.6		0.157		6.3	NA	0.6	4.2				

draft

LANE SUMMARY

Site: Henderson Road / McEwan Avenue Existing Weekday PM

JS10760
Henderson Road / McEwan Avenue
Existing Weekday PM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows L	T	R	Total	HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Lane Length	SL Type	Cap. Adj.	Prob. Block.
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Henderson Road																
Lane 1	0	79	62	141	0.0	1589	0.089	100	3.4	LOS A	0.5	3.2	500	–	0.0	0.0
Approach	0	79	62	141	0.0		0.089		3.4	NA	0.5	3.2				
North: McEwan Avenue																
Lane 1	343	0	133	476	1.4	922	0.516	100	8.5	LOS A	3.7	26.1	500	–	0.0	0.0
Approach	343	0	133	476	1.4		0.516		8.5	LOS A	3.7	26.1				
West: Henderson Road																
Lane 1	80	42	0	122	2.7	1855	0.066	100	4.2	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	80	42	0	122	2.7		0.066		4.2	NA	0.0	0.0				
Intersection				738	1.3		0.516		6.9	NA	3.7	26.1				

Appendix D

Parking Demand Results

Client ID:	JS10760	**Date:**	5/05/2011 and 7/05/2011
Job Name:	North Crestwood Traffic Study	**Weather:**	Partly cloudy
		Location:	North Crestwood

										Thursday Demand 5/05/2011 Time							Saturday Demand 7/05/2011 Time					
			Restriction			Residential																
Street	Side	Between	Type	Hour	Day		Area	Supply	7am	9am	11am	1pm	3pm	5pm	7pm	8am	10am	12noon	2pm	4pm	6pm
Davidson St	E	Uriarra Rd & Young St	Unrestricted	-		Y	1	17	10	5	3	4	3	5	7	8	8	10	8	7	6
Davidson St	W	Uriarra Rd & Young St	Unrestricted	-		Y	1	11	8	5	4	4	5	6	8	10	8	10	10	8	7
Young St	E	Uriarra Rd & Henderson Rd	No Stopping	-		Y	1	20	10	10	2	0	0	0	1	4	10	4	0	0	0
Young St	W	Uriarra Rd & Henderson Rd	Unrestricted	-		Y	1	0	0	0	6	5	6	4	4	0	0	0	4	4	3
Uriarra Rd	N	Young St & McKeahnie St	1P	All Times		N	1	24	0	1	0	0	2	0	1	0	1	1	M	1	2
Uriarra Rd	S	Young St & McKeahnie St	Unrestricted			N	1	29	0	3	1	0	0	2	2	0	1	2	3	4	1
King St	E	Myola St & Uriarra Rd	Unrestricted			Y	1	14	5	2	3	1	3	3	2	0	1	1	2	0	4
King St	W	Myola St & Uriarra Rd	Unrestricted			Y	1	16	2	3	4	3	2	2	5	6	7	6	6	7	6
Myola Street	N	McKeahnie St & King St	Unrestricted			Y	1	5	0	0	1	0	0	0	0	0	0	1	0	0	0
Myola Street	S	McKeahnie St & King St	Unrestricted			Y	1	3	0	0	2	0	0	0	0	0	0	1	1	2	1
McKeahine St	E	Uriarra Rd & Henderson Rd	Unrestricted			Y	1	34	8	5	3	1	5	8	8	10	7	9	8	7	8
McKeahine St	W	Uriarra Rd & Henderson Rd	Unrestricted			Y	1	29	9	2	4	3	5	2	5	4	5	5	2	7	9
Uriarra Rd	N	McKeahnie St & Crest Rd	Unrestricted			N	1	6	1	0	1	0	2	0	0	0	0	1	0	0	1
Uriarra Rd	S	McKeahnie St & Crest Rd	Unrestricted			N	1	6	0	0	3	2	1	0	0	0	0	1	1	1	0
Crest Rd	E	Uriarra Rd & Henderson Rd	Unrestricted			Y	1	21	10	6	6	6	7	9	11	13	14	12	10	12	11
Crest Rd	W	Uriarra Rd & Henderson Rd	Unrestricted			Y	1	25	8	7	8	7	9	9	5	9	9	9	12	14	10
Henderson Rd	N	Young St & Crest Rd	Unrestricted			Y	1	43	0	0	1	0	0	1	3	1	2	0	1	3	2
Henderson Rd	S	Young St & Crest Rd	Unrestricted			Y	1	35	3	1	3	4	2	2	3	1	1	0	1	4	4
Uriarra Rd	N	Crest Rd & Railway Av	Unrestricted			N	2	10	1	0	1	0	4	2	2	1	1	2	1	2	1
Uriarra Rd	S	Crest Rd & Railway Av	Unrestricted			N	2	7	0	0	1	1	0	0	0	0	0	0	0	0	0
Federal Av	E	Derrima Rd & Uriarra Rd	Unrestricted			Y	2	17	3	3	3	3	1	2	3	5	5	4	3	3	3
Federal Av	W	Derrima Rd & Uriarra Rd	Unrestricted			Y	2	17	6	5	8	7	4	4	4	5	9	7	5	4	4
Derrima Rd	N	Federal Av & Railway Av	Unrestricted			Y	2	19	2	0	2	0	1	1	0	0	0	0	1	0	1
Derrima Rd	S	Federal Av & Railway Av	Unrestricted			Y	2	12	0	0	1	0	1	1	1	0	0	0	1	1	2
Railway Av	E	Derrima Rd & Uriarra Rd	Unrestricted			Y	2	19	2	1	2	4	4	4	5	3	3	3	1	2	2
Railway Av	W	Derrima Rd & Uriarra Rd	Unrestricted			Y	2	19	0	0	2	3	1	2	2	1	1	2	2	3	1
Uriarra Rd	N	Railway Av & Ross Rd	Unrestricted			N	2	5	0	0	2	1	0	0	0	0	0	0	0	0	0
Uriarra Rd	S	Railway Av & Ross Rd	Unrestricted			N	2	6	0	0	1	0	0	0	0	0	0	0	0	0	0
Ross Rd	E	Uriarra Rd & Derrima Rd	Unrestricted			Y	2	25	0	1	2	2	0	0	0	0	1	1	0	0	0
Ross Rd	W	Uriarra Rd & Derrima Rd	Unrestricted			Y	2	24	3	0	1	0	1	1	2	0	1	3	3	2	3
Derrima Rd	N	Ross Rd & Railway Av	Unrestricted			Y	2	14	4	3	6	5	2	4	2	4	6	5	4	6	5
Derrima Rd	S	Ross Rd & Railway Av	Unrestricted			Y	2	17	6	3	1	2	1	5	4	3	3	4	3	2	2
Derrima Rd	N	Federal Av & Crest Rd	Unrestricted			Y	2	14	0	0	0	0	1	0	0	4	2	1	2	4	3
Derrima Rd	S	Federal Av & Crest Rd	Unrestricted			Y	2	17	1		1	0	0	0	0	2	1	1	1	3	1
Henderson Rd	N	Crest Rd & Ross Rd	Unrestricted			Y	2	53	0	0	0	0	0	0	0	0	0	0	0	1	0
Henderson Rd	S	Crest Rd & Ross Rd	Unrestricted			Y	2	45	2	0	0	1	0	0	0	1	3	3	5	4	2
Ross Rd	E	Henderson Rd & Derrima Rd	Unrestricted			Y	2	8	1	0	0	0	0	0	0	0	1	2	0	1	0
Ross Rd	W	Henderson Rd & Derrima Rd	Unrestricted			Y	2	8	2	0	1	0	1	3	2	2	1	1	2	2	1
Derrima Rd	N	Ross Rd & Crawford St	Unrestricted			Y	3	20	1	0	1	0	0	0	2	1	2	2	1	2	3
Derrima Rd	S	Ross Rd & Crawford St	Unrestricted			Y	3	18	2	1	2	1	2	2	2	4	5	5	3	5	3
Crawford St	E	Derrima Rd & Henderson Rd	Unrestricted			Y	3	4	1	0	0	0	0	0	0	0	0	0	0	0	0
Crawford St	W	Derrima Rd & Henderson Rd	Unrestricted			Y	3	5	2	1	3	1	0	2	1	1	0	0	0	0	0
Derrima Rd	N	Crawford St & Campbell St	Unrestricted			Y	3	30	3	3	4	2	1	1	5	2	2	1	3	2	4
Derrima Rd	S	Crawford St & Campbell St	Unrestricted			Y	3	29	7	5	6	3	3	2	2	4	3	3	5	5	7
Henderson Rd	N	Ross Rd & Campbell St	Unrestricted			Y	3	55	4	6	5	6	6	1	1	6	7	7	4	2	2
Henderson Rd	S	Ross Rd & Campbell St	Unrestricted			Y	3	50	4	6	6	6	4	1	1	4	4	4	3	2	1
Uriarra Rd	N	Ross Rd & Crawford St	Unrestricted			N	3	0	0	1	0	0	1	2	2	2	2	2	4	3	3
Uriarra Rd	S	Ross Rd & Crawford St	Unrestricted			N	3	17	5	6	5	4	6	3	2	4	8	7	9	7	8
Crawford St	E	Uriarra Rd & Derrima Rd	Unrestricted			Y	3	11	7	9	6	6	10	14	9	8	9	6	10	11	11
Crawford St	W	Uriarra Rd & Derrima Rd	Unrestricted			Y	3	15	9	7	9	10	14	11	17	13	14	14	12	15	16
Collett St	N	Crawford St & Campbell St	Unrestricted			Y	3	7	2	0	0	0	2	2	2	3	1	2	2	2	3
Collett St	S	Crawford St & Campbell St	Unrestricted			Y		8	0	0	0	1	2	4	3	3	3	3	6	7	6
Moore Street	N	Campbell St & Crawford St	Unrestricted			Y	3	13	2	0	0	1	0	0	1	0	0	0	1	0	1
Moore Street	S	Campbell St & Crawford St	Unrestricted			Y	3	14	0	3	6	7	1	1	1	2	2	1	1	1	1
Crawford St	N	Moore St & Campbell St	2P	8:30am - 6pm 8:30am - 12:30pm	Mon-Fri Sat	N	3	16	0	4	7	5	0	2	1	0	6	7	0	0	0
Crawford St	S	Moore St & Campbell St	2P	8:30am - 6pm 8:30am - 12:30pm	Mon-Fri Sat	N	3	15	4	9	8	6	0	3	2	4	4	2	4	5	2
Campbell St	E	Crawford St & Moore St	Unrestricted			N	3	11	0	0	1	1	3	0	2	0	0	3	0	1	1
Campbell St	W	Crawford St & Moore St	Unrestricted			N	3	13	0	4	4	5	0	0	1	1	1	0	1	1	2
Campbell St	E	Moore St & Henderson Rd	Unrestricted			Y	3	9	0	0	0	0	0	0	0	0	0	0	0	0	0
Campbell St	W	Moore St & Henderson Rd	Unrestricted			Y	3	8	3	2	2	1	2	0	2	2	2	2	1	2	1
								1062	163	133	165	135	131	133	151	161	187	183	173	194	181

Figure D1: Campbell Street - Parking Survey Results

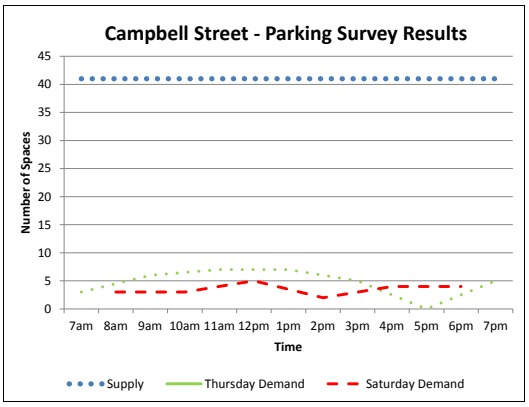


Figure D2: Collett Street - Parking Survey Results

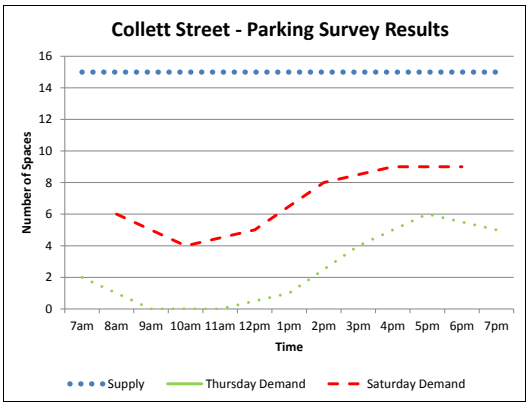


Figure D3: Crawford Street - Parking Survey Results

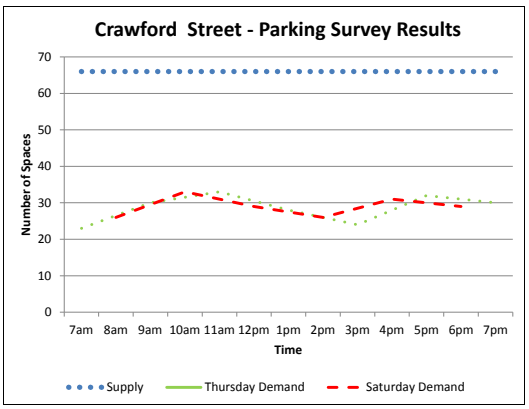


Figure D4: Crest Road - Parking Survey Results

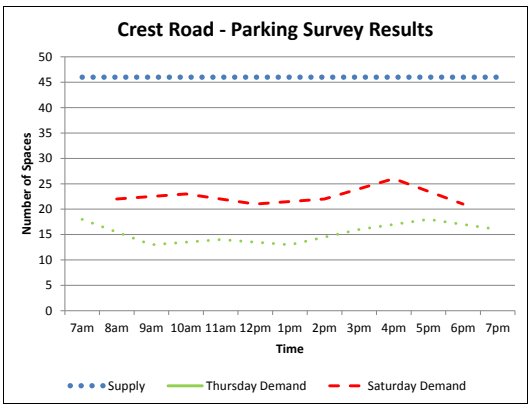


Figure D5: Davidson Street - Parking Survey Results

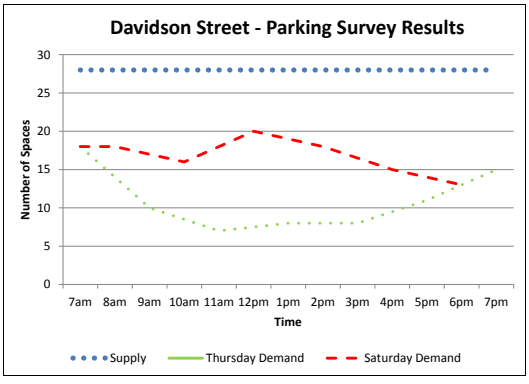


Figure D6: Derrima Road - Parking Survey Results

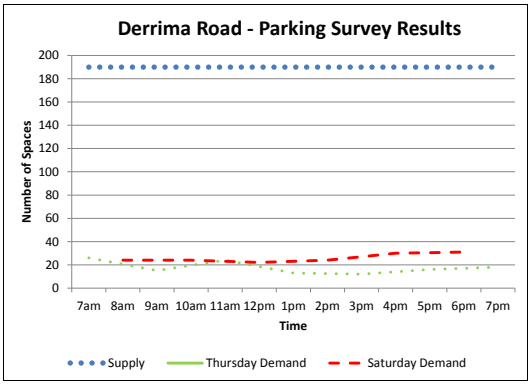


Figure D7: Federal Avenue - Parking Survey Results

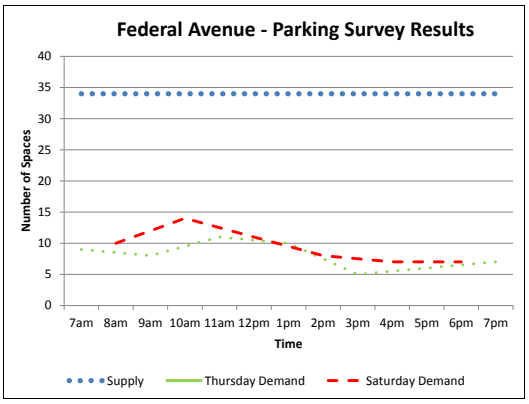


Figure D8: Henderson Road - Parking Survey Results

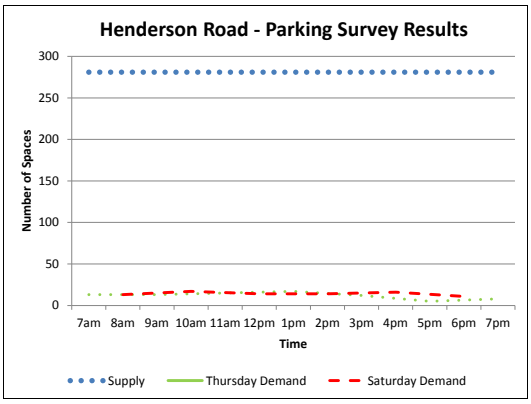


Figure D9: King Street - Parking Survey Results

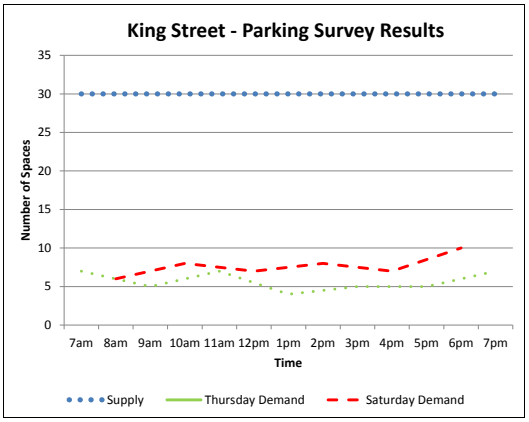


Figure D10: McKeahnie Street - Parking Survey Results

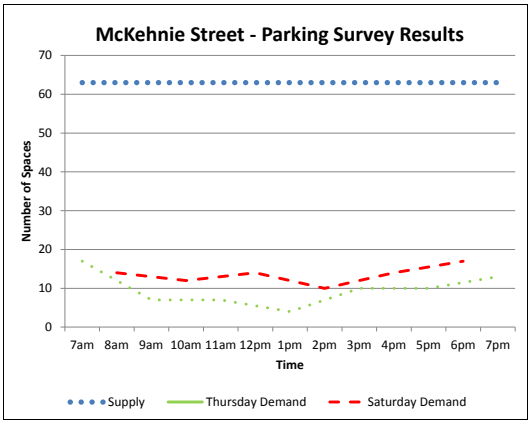


Figure D11: Moore Street - Parking Survey Results

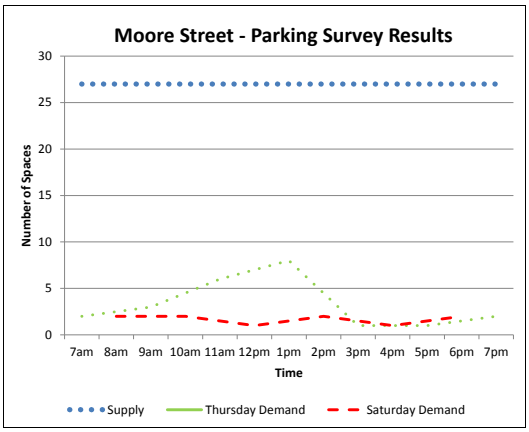


Figure D12: Myola Street - Parking Survey Results

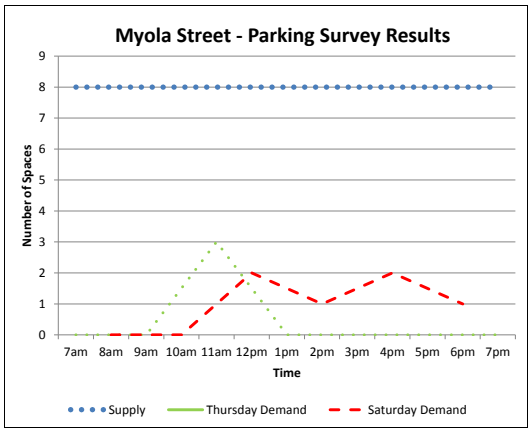


Figure D13: Railway Street - Parking Survey Results

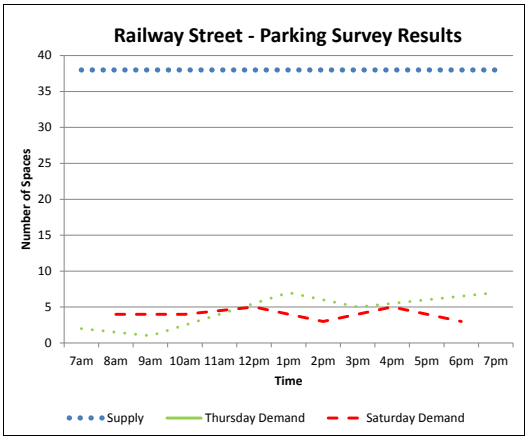


Figure D14: Ross Road - Parking Survey Results

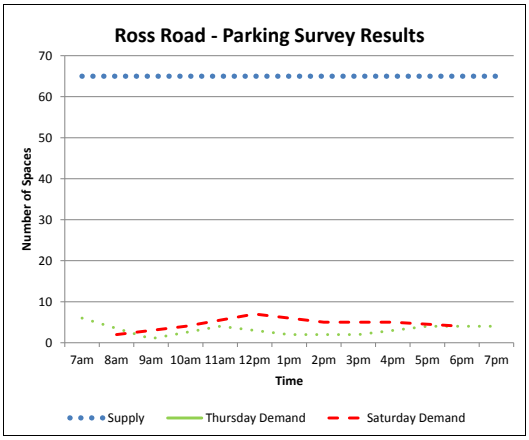


Figure D15: Uriarra Road - Parking Survey Results

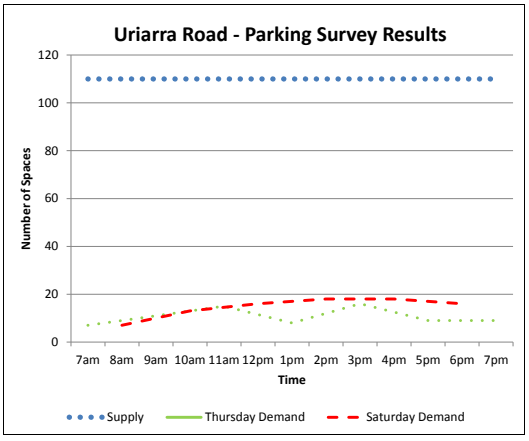
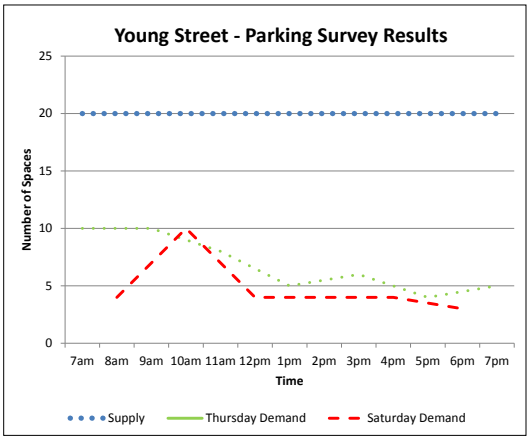


Figure D16: Young Street - Parking Survey Results



draft

Appendix E

Questionnaire and Results Summary

Respondent N.o.	1 - Intersections a) Intersections unsafe for turning										Comment	b) Intersections experience delays when turning								Other	Comment	2 - Pedestrians a) Key pedestrian issues									3 - Cyclists a) Key issues affecting cyclists					4 - Parking Finding Parking Space				5 - Other Comments
	Uriarra Rd/ Young St	Uriarra Rd/ Frederick St/ McKeahnie St	Uriarra Rd/ Crest Rd	Uriarra Rd/ Blackall Ave	Uriarra Rd/ Ross Rd	Uriarra Rd/ Crawford St	Collett St/ Campbell St	Henderson Rd/ McEwan Ave	Other			Uriarra Rd/ Young St	Uriarra Rd/ Frederick St/ McKeahnie St	Uriarra Rd/ Crest Rd	Uriarra Rd/ Blackall Ave	Uriarra Rd/ Ross Rd	Uriarra Rd/ Crawford St	Collett St/ Campbell St	Henderson Rd/ McEwan Ave	Other		Insufficient pedestrian crossings on Uriarra Rd	Location(s)	Insufficient pedestrian crossings in other streets	Location(s)	Footpaths not wide enough	Location(s)	Lack if footpath	Location(s)	Insufficient marked bicycle lanes	Location(s)	Unsafe intersections	Location(s)	Other issues	Location(s)	Easy	Moderate	Difficult	Comment	
1																				Uriarra/Stornaway							1	On high side of Stornaway near Uriarra dangerous for prams to cross				1	Cyclists too far out on roads			1		I have had many near accidents due to parked cars. I own 24 Uriarra rd next door to doctor bills. There will be deaths due to not seeing oncoming traffic due to cars parked on side of road in "no parking" out front of his surgery.
2							1																								1	Dentrona onto campbell (particularly a right hand turn) is dangerous due to committed view of traffic from either side (henderson/campbell) limited view of traffic coming from left (crawford st) when coming out of dentrona rd					Dentrona onto campbell (particularly a right hand turn) is dangerous due to committed view of traffic from either side (henderson/campbell) limited view of traffic coming from left (crawford st) when coming out of dentrona rd
3																																						
4			1			1	1	1								1	1					1	Uriarra rd,Crowford St, Collett St, Campbell St							1		1	Uriarra Rd,Crawford St			1		Need speed humps on collet st to slow down speeding cars down
5	1	1			1	1						1			1	1		1				1	around russ rd/uriarra rd				1	Along Derrima Rd	1	All along Uriarra Rd						1	Along Uriarra rd any street in the study area	
6						1										1				Uriarra rd/Sunrise apart - why stop the right turn for vehicles from crawford st?		1	Sunrise apartment							1	Crawford st/Uriarra Rd	1	Uriarra Rd,Crawford St			1	Not enough parking space both inside the apartment compound and on the street, parking along the street (next to apart) block the view of the vechile/pedestrian getting out of sunrise, its not safe	More parking space are required especially there are more apartment buildings and there is not enough parking inside the apartment compound. Need more zebra corssing for pedestrian
7				1	1	1									1	1						1	Uriarra rd/russ rd, kids cross lane leading down to the skate park											1	Oaks estate/oaks estate rd	1				Crossing Uriarra rd between the pub and takeaway shop is dangerous
8																	1																					Occupiers of the gateway apartments park in crawford st so other residents cant find a park sometimes. My driveway has been parked in several times. As a twice-daily driver on Uriarra rd I find it difficult to spot pedestrians wanting to cross at the pedestrian crossing near the pet shop. Pedestrians also want to cross Uriarra rd at the service station and this is very dangerous for them	
9	1						1									1										1	Uriarra rd						1					
10					1		1								1	1	1					1	From Blackall ave to morrisset st as there are no pedestrian crossings or kerb crossings for prams to get from one side of Uriarra rd/Crawford st to the other									1					1				
11	1			1	1			1				1			1	1		1				1														1		Significant and un-nessessary "no parking" areas on Uriarra rd particularly near sunrise apartments and top pub	Dangerous pedestrian corssing on Uriarra road. Poor visibility of people entering crossing, especially during the afternoon with sun directly in eyes
12				1											1	1	1					1	Ross Rdlround about and P.Cl														1	Depending on time	
13			1											1																									
14						1										1						1	Cnr crawford & Uriarra														1		
15				1		1									1	1																					1		
16																		1																			1		
17	1				1											1															1	Cnr Ross and Uriarra Rd				1			On Uriarra rd and ross there is a traffic island i have difficulty at 17 Uriarra rd reversing out of my drive way
18			1								Due to many cars parked on the crest rd towards Derrima rd			1												1										1			Too many cars parked on the Derrima rd close to number 83 of crest rd(when you turn left on to crest road from Derrima rd
19				1	1												1	1													1	Affecting motorists cyclists not using designed bike paths	1				
20			1																							1						1							
21					1											1	1																			1			There is little or no room to pass a cyclist who is passing a parked vehicle on Uriarra Rd. Why are they not using the cycle path alone Henderson rd?
22					1							1					1					1	only 1 on this road												1		1	Since new development - seems inadequate parking spaces in new units	This survey should have been undertaken before two new large blocks of units were given the go ahead 200m apart
23			1									1													1													
24					1	1										1	1	1										1	Footpaths unfit for electric wheelchairs and electric scooters all around this area										
25		1	1	1		1									1		1																		1		There is insufficient off street parking for visitors of units along Uriarra Rd	There is a lot of truck noise along Uriarra Road
26					1		1												1			1													1			
27						1										1	1											1	Derrima rd								1	Derrima rd in front of number 67 men take there work truck home and other people have too many large cars	
28																	1									1					1	Bike tracks to park bikes while shopping	1				Turning right from Derrima road onto Campbell street
29	1				1			1				1				1	1	1																		1		We have little enough parking space onto the street now and with the new units at 21 Henderson rd its going to be a situation
30	1				1	1	1								1		1	1				1	Uriarra, Crawford up to Ross rd													1	1		One way need in Collett st between Crawford and Campbell st when cars are parked on both sides of Collett st, driving and passing is to dangerous due to pub business.
31																																						I cannot comment as I no longer drive since I had a stroke last year
32				1	1	1									1	1	1											1	Derrima rd								1	Around 67 Derrima rd is difficult from 4pm	
33			1			1									1		1	1																					
34					1	1											1					1	Uriarra/Ross - very difficult footpaths on either side of Uriarra aren't even on same side of road													1			
35	1	1	1	1	1	1	1	1							1	1		1																			1			Lighting at intersections, Blackall and morton st intersection has only one street light cars cannot see pedestrians at dusk/night until upon them - then it could be too late. I speak from personal experience
36					1																																	Traffic light on Uriarra rd/Crawford st
37		1			1								1			1															1							
38																														1	Along Uriarra Rd cyclists often block traffic	1	Near the round about access to arterior road to Canberra ave				1		
39				1	1											1	1					1	Between Ross rd and Stornaway rd								All around QBN								
40					1												1																			1		Lots of units being built which will make it difficult	
41						1										1							Any more would be good													1			Dentrma rd into Henderson rd at Greek church end is very dangerous as both right and left turns blind
42																																					1			I have lived in QBN for 49 years and find it okay a good place to live
43					1			1									1																				1			Dentrma rd footpath between Crawford and Ross rd is not in good repair - dangerous, especially of night
44					1										1		1		1			1	To get to QBN high										1				1			Needs more pedestrian crossings to get to QBN high and west primary, blind crossing from ross rd across Uriarra rd heading west
45					1												1					1								1	Uriarra/Stornaway						1			Speed calming measures on ross rd between Uriarra/Morton both directions
46					1		1				Please see survey for diagram							1																			1			I would regard the three way intersection opposite nursing home and the lighting centre as very dangerous, I avoid it at all times
47					1												1																						Traffic needs to be slowed down at collett st/campbell st vehicles travel very quickly over crest of campbell st and up collett st
48	1	1	1	1	1	1	1	1	1			1	1	1	1	1	1	1	1																	1			How about a set of traffic lights at the intersection of ross rd and uriarra rd?
49	1				1											1														1	All along uriarra rd - bike riding area (shoulder) disappear in some areas			1	Lane runs into the shoulder of road suddenly- before ross rd, railway ave					Curve in rd at crest rd/uriarra area could be dangerous if going too fast . Difficult to cross as pedestrian between dawson and young
50															1		1	1						1	For school children at QBN west P.S - Outside study area						1	Needs a whole town plan			1	Motorists not aware of cyclists	1				Surely a "transport" survey should include buses and taxis, community transport
51					1												1											1	Broken and uneven footpaths				1	Badly for bicycles	1				I experience only minor delays at all intersections. Have ticked Uriarra/ross intersection because they have down that hill - care needed
52			1	1	1	1										1														1	Along Uriarra rd	1	all intersections along uriarra rd				1			Widen footpath and share footpath with bicycle lane could provide safety and save space
53			1		1	1									1		1													1	Uriarra rd			1	Poor road surface especially ross and crest		1			The trucks from 4d surveying block vision when leaving celsica place, very dangerous.
54																	1															1	Uriarra rd/Ross rd						1			Most of the intersections on Uriarra rd border on unsafe for right hand turns. Generally are ok for left turns. Delay are rare but in peak times can sometimes have delays getting out of Uriarra rd

Respondent N.o.	1 - Intersections a) Intersections unsafe for turning											b) Intersections experience delays when turning											2 - Pedestrians a) Key pedestrian issues											3 - Cyclists a) Key issues affecting cyclists								4 - Parking Finding Parking Space				5 - Other Comments
	Uriarra Rd/ Young St	Uriarra Rd/ Frederick St/ McKeahnie St	Uriarra Rd/ Crest Rd	Uriarra Rd/ Blackall Ave	Uriarra Rd/ Ross Rd	Uriarra Rd/ Crawford St	Collett St/ Campbell St	Henderson Rd/ McEwan Ave	Other	Comment	Uriarra Rd/ Young St	Uriarra Rd/ Frederick St/ McKeahnie St	Uriarra Rd/ Crest Rd	Uriarra Rd/ Blackall Ave	Uriarra Rd/ Ross Rd	Uriarra Rd/ Crawford St	Collett St/ Campbell St	Henderson Rd/ McEwan Ave	Other	Comment	Insufficient pedestrian crossings on Uriarra Rd	Location(s)	Insufficient pedestrian crossings in other streets	Location(s)	Footpaths not wide enough	Location(s)	Lack if footpath	Location(s)	Insufficient marked bicycle lanes	Location(s)	Unsafe intersections	Location(s)	Other issues	Location(s)	Easy	Moderate	Difficult	Comment	
55			1																												1	Keep bike lanes/paths OFF the road. Its dangerous and do not want to ride my bike on the road if I can help it	1				The off camber corner at Uriarra/Crest rds is terrible to drive around. All traffic is slow to about 30 k/h and is dangerous in the wet. It was recently resurface but that was no help - needs considerable work to change camber
56	1				1	1	1						1		1	1					1	Top pulls, PB (ross rd) area								1	All the peak time am and pm intersections off Uriarra rd			1		New corner left turn from Henderson into Crawford very hard to turn. In carlet alone large vehicle so difficult to cross from one side of Uriarra/Crawford to the other, why not round about adjacent play area to link erin, campbell, crawford to help crossflow
57					1	1									1	1					1	Between Crawford st and frederick st											1	Need for regulated and standard visibility warning devices on bikes		1			Cyclists are sometimes almost invisible in low light along Henderson rd, bells are hard to hear, they need standard and bike warning devices and visibility gear
58					1										1						1	Ross rd and Uriarra rd also lacks mobility ramps			1	Ross rd and Uriarra Rd						1					
59			1		1	1	1									1																	1		Areas around apartment buildings are usually pretty full	The end of Collett st that meets Crawford st often gets unsafe due to cars parking right near the corner, blocking much of the road. This corner is particularly tight anyway so it should be no parking.
60					1	1									1	1														1	Crawford st/Uriarra Rd			1		Traffic lights urgently needed at ross/ uriarra rd intersection
61			1		1							1				1		1			1													1	Too much development - no consideration given before approval to build	Moore st is often used as a short cut too many speeding vehicles. New development will create a problem with on street parking and new town houses
62					1										1																	1			Seems a lot of cars and motorbike speed on ross rd
63					1	1									1	1					1	Ross rd, crawford st									1						I live at 11-13 Campbell st the intersection of Campbell, erin, crawford and uriarra is a notorious intersection and on the very edge of your survey every intersection on the winding uriarra rd is appalling and almost every is blind
64			1		1	1	1	1			1	1			1	1	1	1			1	Uriarra Rd/Crawford st (from top pub to bus stop across Uriarra rd)	1	Henderson Rd/McEwan ave (Crossing both Henderson and Mcewan is difficult and dangerous)	1	Henderson rd, Derrima Rd, Campbell st, McKeahnie st, Young st	1	West end of Derrima rd has no path in some areas	1	Uriarra rd	1	Campbell and collett; henderson and McKeanr; Uriarra and McKeahnie; Uriarra and Crawford	1	Drives must be educated that cyclists are allowed on road too	1		1	Most roads are easy but its difficult and sometimes unsafe on uriarra rd, as there aren't many space and its very busy	I think traffic lights should be installed for safety for cars, pedestrians and cyclists reasons at these intersections: Henderson rd/McEwan ave; Collett st/Campbell st; Uriarra rd/Crawford st; Uriarra rd/Ross Rd; Uriarra rd/McKeahnie St/Frederick st
65					1	1		1			1		1		1	1					1						1	Between McEwan and the railway station			1			1			Trying to find a car park is often very difficult in the CBD area, multi level car park badly needed.
66									Killiand st/Crawford St												1									1			1				
67	1		1		1	1	1	1			1		1		1	1	1				1	Uriarra/Crawford	1	Henderson/McEwan									1						
68		1				1	1									1	1														1	Crawford and Campbell st					
69							1	1									1	1									1	Where Henderson becomes campbell to collett st - cannot stay on one side must cross busy traffic	1					1				Motorists accessing Henderson rd from the young st entry point up to Crawford street build up speed and drive aggressively to gain access to QBN centre or the ACT. Traffic slowing round about like I have seen in South QBN would be wonderful
70					1	1										1																			Entering Uriarra rd from Crawford st cars coming down Uriarra rd you cant see very far up the road for the hotel building unless you go out forward to see around the building
71				1	1										1	1																	1			
72				1											1						1	section of Uriarra rd/Crawford st												1				
73				1												1																	1			
74				1	1	1								1	1	1							1	Ross rd and Uriarra rd								1	No room for bikes full stop	1				Turns onto Uriarra rd in peek time can take up to 5 minutes sometimes i.e. turn right between 730-8am
75		1										1	1				1									1	Derrima Rd	1						1			
76		1	1		1	1									1																	1			
77					1		1									1	1																1			
78					1	1	1	1							1	1	1						1	Crawford st from Collett											1			When turning right Erin street into crawford st parked car block vision on left hand side
79					1				Derrima/Campbell st							1										1	North edge of Derrima rd	1	Uriarra btw Crawford and Railway st					1		With increased street parking visibility leaving driveways reduced. Increased street parking on Derrima btw crawford and campbell st	With the completion of the townhouses corner Henderson and Derrima rd, visibility at the intersection Derrima/Campbell near a sweeping right angle b end and crest of a hill makes visibility an issue
80											1	1	1	1	1	1	1		Erin st/Crawford st		1	Footpath outside pub is disgusting			1	Poor quality footpaths - poor surface, changing width and location in nature strip, differing surfaces					1				Difficult on Uriarra rd	B-double trucks travelling too fast, even if going speed limit
81																			I have seen a bad car accident on the corner of Crawford and Campbell st																	I am a disabled pedestrian with a walking frame, walk signs on somerard crawford street do not give me time. I am usually 2 metres to foot path before walk sign stops
82					1					Both intersections however the corner coming up from the railway station i.e. facing south is blind and extremely dangerous					1	1					1	Uriarra rd and ross rd							1					1				Parking space in velacia is impossible however it is just outside your study area
83			1		1	1	1	1		5-Poor sight line; 6-good sight lines but little time; 7-vehicles roll through stop signs; 8-tend to cut the corner					1	1					5-would not attempt in inten7 the north	1	Collett and Campbell st			1	From Greek church to retirement village						1					The major traffic issue is that traffic to and from Oaks estate (and the ACT) is directed to McEwan ave along Henderson rd and down campbell and collett st . Council has permitted mainly* 40 townhouses to be built between McEwan and the start of Campbell St. The comex* at the Eastern end of Henderson Rd is very dangerous with many motorists driving very fast. there is a blind spot as you enter Henderson Rd when travelling west. vehicles turn up into residences in Henderson Rd are at times not visible to vehicles travelling west. As the number of vehicles parked on Henderson increases (due to inadequate parking at town* houses) so the risk of accidents increases. Heavy vehicles crossing the bridge are directed away from the intersection of henderson and crawford (although this is an extension of the main road) by the design of the intersection which is a turn of almost 120degrees when leaving henderson road. Commercial vehicles avoid this turn. If the intersection was improved less traffic would use Campbell and Collett which have residential and less vehicles would drive past the hospital.
84																					1	Most important between bus stops have seen old people trying to cross the road								1			1				The main difficulty I feel is not so much the intersection but getting onto the road out of our driveways, I have found the only way to make sure its safe is watching the windows in the old o'brien glass
85						1				Stop sign at Derrima rd, campbell st, henderson rd. Blind by cars parked outside of Derrima rd and tree and units on the opposite corner cars speeding along henderson rd						1	1				At peak traffic times													1		At times difficult when Greek church has functions and bus are parked around the area traffic becomes dangerous	
86					1	1									1	1					1	North Crestwood			1	North Crestwood	1	North Crestwood	1	North Crestwood	1				1		I live at sunrise units the traffic is terrible and parking a disgrace to the council. Especially the heavy fines for people returning home after work to find others have parked in their allocated car spots. Alternative parking must then be found none ever available or cars are usually dumped in the car spots and never removed. This is the first time the council has identified and accepted the issue.
87					1	1			Uriarra/Stornaway rd							1			Uriarra/Stornaway rd																	Uriarra rd, residents of sunrise apartments all drivers go across double lines to go in west direction, extremely dangerous/illegal habit. Stornaway rd (at uriarra end near pub/corner store) currently allows parking on both sides of the street, which leaves only a single vehicle to progress through near all units, very dangerous at peak times. Suggest no parking one side of Stornaway rd from Uriarra rd to Killard st
88					1					Especally when driving south along ross rd and trying to turn right onto Uriarra rd or even go straight across this intersection					1	1						I used to experience delays but I now always avoid the intersection														
89							1		Uriarra/Erin St, Uriarra/Campbell intersection, I think requires lights as large intersection hard to cross certain times of the day												1														1			
90							1	1	Collett st/Crawford st									1	Uriarra rd/Railway ave - takes 5 mins to turn right out of railway ave in mornings. Parked cars cant see past						1	too many trees, cracks	1	Derrima rd	1	Uriarra rd - dangerous						1		1	Flats need more parking spaces	Too many parked cars on Derrima rd near flats, Two cars cant pass - is dangerous. Too much traffic on Uriarra rd sometimes blocked up to McKeahnie st
91									Uriarra rd/Kinkora										Uriarra rd/Kinkora		1	On Uriarra near crawford st						1	Along Uriarra rd			1	Concrete islands in the middle of Uriarra force cars to come too close to cyclists	1			I cycle on Uriarra rd because this is where I live. The bike path is close but I still prefer to cycle on Uriarra rd	Bike paths on Uriarra rd should be included as part of the progressive resurfacing over the last couple of years
92			1		1		1	1	Out of Derrima into Campbell		1	1	1	1	1	1					1	Near Stornaway - but a crossing would be dangerous drivers round the bend into afternoon sun								1	Through the bends on Uriarra near crest rd			1		I park in my driveway so don't have difficulty I see a future problem with more and more flats with no visitor parking
93						1	1		Collett st/Crawford st especially when cars are parked on both sides of the road right up to the intersection							1					1	There is only one - need more not suer where though							1	Uriarra rd needs bike lane			1	Vehicle drivers don't give cyclists a fair go always cutting them off	1				Intersection of collett st/campbell st is very dangerous and need immediate attention. Intersection of collett st/crawford st cars parked on both sides of road right up to intersection and cars cant get past
94			1			1			Collett st/Crawford				1			1					1	At Uriarra rd/Crawford st							1	Along Uriarra rd	1	Uriarra rd/Crawford st	1	Insufficient lighting on bike paths			1	Parking on streets around Uriarra rd/Crawford st is very difficult on busy top pub nights, hard to drive through collett st/Crawford st corner	Collett st/Crawford st corner is too narrow to have parking on both sides of the street. Patrons of the top pub park over/obstruct residents driveways
	11 12%	9 10%	18 19%	10 11%	52 55%	47 50%	23 24%	12 13%	9 10%		11 12%	7 7%	17 18%	12 13%	49 52%	55 59%	17 18%	8 9%	7 7%		37 39%		8 9%		8 9%		15 16%	33 35%		24 26%		18 19%	33 38%	41 47%	14 16%	88	

Respondent N.o.	1 - Intersections														2 - Pedestrians								3 - Cyclists						5 - Other Comments
	a) Intersections unsafe for turning							b) Intersections experience delays when turning							a) Key pedestrian issues								a) Key issues affecting cyclists						
	Uriarra Rd/ Young St	Uriarra Rd/ Frederick St/ McKeahnie St	Uriarra Rd/ Crest Rd	Uriarra Rd/ Blackall Ave	Uriarra Rd/ Ross Rd	Other	Comment	Uriarra Rd/ Young St	Uriarra Rd/ Frederick St/ McKeahnie St	Uriarra Rd/ Crest Rd	Uriarra Rd/ Blackall Ave	Uriarra Rd/ Ross Rd	Other	Comment	Insufficient pedestrian crossings on Uriarra Rd	Location(s)	Insufficient pedestrian crossings in other streets	Location(s)	Footpaths not wide enough	Location(s)	Lack of footpaths	Location(s)	Insufficient marked bicycle lanes	Location(s)	Unsafe intersections	Location(s)	Other issues	Location(s)	
1	1				1							1									1				1					
2		1	1							1	1				1														More direct access to oaks estate road please
3			1		1						1	1			1				1		1								
4					1							1			1	Ross rd/Uriaara rd intersection													The curve in Uriarra rd makes turning off ross rd difficult because traffic cant be seen. Uriarra rd is increasingly the route for large trucks that gain speed coming into town along Uriarra road making turns or crossing of Ross rd
5	1	1	1		1			1	1	1	1	1																	
6	1	1	1	1	1				1	1		1			1								1		1				
7		1			1				1	1	1	1			1	One near the BP would be great			1	Everywhere			1	Ross rd,Crest rd					
8			1							1					1	Uriarra rd/Stagion st	1	Uriarra rd/Federal ave											
9	1				1										1	In all study area													
10	1	1	1	1	1			1	1	1	1	1			1	From Moriesset to Ridard ave										1	Speeding, eg between ridard ave to campbell st	
11			1	1							1																	The sun in the afternoon is a safety problem when trying to turn into Uriarra rd as you are blinded to traffic coming from canberra
12	1	1	1	1	1					1		1											1	Most of Uriarra rd	1	Uriarra rd into ross rd			Not enough lights on Uriarra rd
13	1	1	1	1	1					1													1		1				
14		1	1							1	1																		
15					1			1	1	1	1	1			1	Uriarra rd/Ross rd					1	Derrima rd				1	Parking issues crest rd	Parking issues within study area due to development of present and future projects
16			1		1			1		1		1											1		1				There are too many cars parked in crest rd no provision has been made for increased traffic of and parking due to high density developments in this area. Traffic and hooning has increased on Henderson rd as alternative to Uriarra
17			1	1	1					1	1	1													1				Parking in streets around Derrima rd, ross rd, crest rd, the amount of development happening and not enough parking being provided causes major problems within the streets effiectivly bring the street to a one way access. Many accidents occur.
18								1																		1	Poor state of road surfaces	Crest rd is not wide enough for two cars to pass if cars are parked on both sides of road. At crest rd/Henderson rd junction cars are often parked right down to corner making it hard to see in to crest when turning off Henderson
19			1												1	Between crest and ross rd										1	Bikes trying to navigate the round about at Uriarra/Richard intersection by crossing Uriarra rd between crest rd and young st	
20	1																						1	All along Uriarra rd			1	Parts of Uriarra rd are narrow making it dangerous for cyclists during heavy traffic	
21		1	1							1	1																		
22																			1	On Blackall side of Uriarra between blackall and richard									Footpaths are not kept clear of grass and weeds and are in poor condition between young st and blackall ave on south side of Uriarra
23	1							1							1	Young/dawson/McKeahine st have to walk down to further to cross													Anther traffic issue of grave concern is speeding vehicles on morton st between lorn rd and the primary school
24					1							1			1		1		1		1				1	Make 40 k/h zone to park			
25	1	1	1	1	1		At all times	1	1	1	1	1		At all times															
26	1	1	1	1	1			1		1	1	1			1	need one closer to round about and pub													
27	1							1							1														
28		1		1	1					1	1	1			1	Frederick and Richard ave													
29											1																		
30		1								1					1	Uriarra rd/Frederick st to bus stop									1	Uriarra/Crest rd			Far to many cars parked on either side of Arthor street. Thus not able to get through if another car approaches
31										1					1	Full length of study zone			1	Full length of study zone					1				Existing pedestrian crossing is poorly controlled. Its position does not lend itself or easily seen by traffic flow. Cars that are sstopped risk near end collision from other cars.
32	1	1	1	1	1					1		1											1				1	Broken glass on Cycle pathways	There are too few facilities for parking bicycles in the shopping arears. Traffic lights at Uriarra rd/Ross rd seems to be the most fair and reasonable intersection solution
33	1				1							1																	
34		1			1				1	1	1	1			1	70-72 Uriarra Rd area											1	Insuffcient use of bike path along henderson rd	Over use of Uriarra rd by trucks and semi trailers. Adjustment of speed limits dangerous parts of Uriarra rd
35					1					1													1						A lot of cracked concrete paths
36					1		Just a matter of time before there is a serious accident					1																		
37		1	1							1	1								1	Sthn side of Uriarra rd	1	Kendall ave north	1	Uriarra rd, railway st, oaks estate rd					Heavy vehicle traffic in Ernest st due to the truck business on the corner of Ernest and Richard is a constant problem, we have had our telephone line torn out twice in the last 2 years
38					1						1	1			1	Near bus stops (nears Uriarra and ross rd)					1	Side streets such as Blackall ave						The Closeness of Blackall and ross makes these two intersections very dangerous to turn as do the crests and angles of roads and high volumes of traffic on Uriarra rd.
39	1	1	1	1	1				1	1	1	1																	
40	1	1	1	1	1						1	1			1	Ross rd/Uriarra rd	1	Ross rd/Derrima st			1		1		1		1	Insufficient bike paths	Vehicles generally do not perform a compulsory stop at ross rd/Uriarra rd intersection. Pedestrian crossing can be very dangerous as traffic finds gaps to use
41																													I drive in the study area quite often - I have never had difficulty in negotiating any intersection mentioned in the study area. Any driver that does needs further tuition
42	1		1	1	1			1		1	1	1			1	All	1	Henderson Rd/Crest Rd	1	Nil Derrima Rd	1	Frederick st			1	Crawford/Collett		Parking either side on crest,ross,derrima not wide enough and dangerous. Speeding on Henderson rd, need speed humps burn outs in BBQ area, ban cars
43																					1	Derrima rd from crest/ross rd						A lot of vehicles use Uriarra rd but the traffic appears to run smoothly - even at peak times in the morning and evenings no problems for me
44	1	1	1	1			Particularly during peak times	1	1		1			Right turns									1	Along Uriarra rd	1	Along Uriarra rd	1	Poor sight distances along Uriarra rd	
45				1	1							1													1				If you are heading south from ross rd it is difficult to see on coming traffic from west of Uriarra rd. This forces you to rush through the intersection to get across Uriarra rd. There were so many near misses involving cars and pedestrians here. Please see diagram on survey
46					1							1			1	Ross rd	1	Across ross rd			1	Both sides of ross rd should have paths especially with new high rise at #10						Uriarra rd is far too narrow and winding and carries too much traffic for 60 km/hr speed limit. Council should press RTA to make it 50 km/ph. Lights should be installed at Uriarra/Ross td intersection. Traffic calming and road marking needed in ross rd (north of uriarra)
47					1						1	1																	The existance of a skate ramp in Henderson rd immediately opposite residential houses is a complete misery to these houses residents. The ramp needs a fence around it to prevent cars from driving up the sides of the ramp at the very least. Other areas of the park are on continuous attraction to burn outs and often aggressive behaviour. The railway park should have restricted car access.

48							Derrima/Federal ave																															Parking on crest rd between Uriarra rd and Henderson rd reducing traffic to single lane between 4.30pm and 8.00am. Parking on Derrima rd between crest rd and federal ave as above both streets are very dangerous
49						1								1			1		Cant go down town using my wheelchair	1	Go to petrol station across	1	I have to use my wheelchair	1	Ross rd where new location will be built			1	to corss to petrol station	1	very fast drivers to park		As I mention I cant find my way to go down town using my electric wheelchair. Im driving modified car coming back from or going to my son's school is very scary on the corner - not visible enough if car comes.
50		1		1	1			Very dangerous	1	1	1	1	1				1	Corner of ross rd and Uriarra rd, near QBN hotel and between ross rd and young st - only one crossing					1	Ross rd from Henderson rd to Uriarra rd footpath on one side only. Derrima rd footpath on one side from campbell st to ross rd and no foothpaths from ross rd to crest rd - very poor situation			1	Ross rd and Uriarra rd/Blackall ave. Uriarra rd/Frederick st/McKeahine st			I have serious concerns about the impact of the future developments at 35 Uriarra *4 *10 ross rd on the traffic situation in this arear - 109 units proposed at these addresses. Regarding these developments the suggestion has been made by council that traffic from the ross rd complexes will use side streets to avoid the intersection at Uriarra rd/ Ross rd. I do not think many of these streets will cope with additional traffic eg crest rd, derrima rd, as cars already park there on both sides of these streets, due to lack of parking in the flats and other premises in these streets
51																					Crawford st - between nursing home and playground or between crawford st medical centre and otherside (very dangerous trying to cross with prams/kids wheelchairs and walking frames												My main concern is the lack of pedestrian crossings on crawford st due to the aforementioned reasons. Add the fact that many drivers exceed the 50 km/hr speed limit and merging lanes ive seen too many near misses
52	1				1				1	1			1											1	Derrima rd (between ross rd and crest rd)					1	Where Uriarra rd narrows between railway ave and ross rd very dangerous		**A lot of cars accelerate on Derrima rd trying to get airbone at the crest outside #** 82 derrima rd and coming up from ross rd at the base of railway ave theres a slight hump this really annoys me
53			1				Uriarra/Railway, Uriarra/Federal				1			Uriarra/Railway, Uriarra/Federal								1	Whole length of Uriarra rd	1	Wide and smooth enough	1								Where islands have been installed on Uriarra rd a narrow car lane with no room for a cyclist has been left very dangerous for a bike. Maybe concrete footpath should be considered to wide between these for cyclist and walkers
54							Derrima rd/Crawford st	Someone is **putting** there bins so close to the intersection its very hard to see traffic coming **down** crawford st going towards Henderson rd and parked cars blocks the view of oncoming traffic	1		1		1		Henderson rd park has no speed bumps pedestrian areas, in park, no way to limit the speed in this area																				Henderson rd between crest rd and crawford st becomes a speedway for some motorists! They are random but very fast and very annoying. Can there please be speed bumpbs put along this road. Cross with my 5yr and 3yr old boys
55		1	1			1				1	1		1																						Traffic along ross rd into henderson rd into oaks estate in mornings and afternoon. Also up henderson rd, to the crest rd up further area and the henderson rd park area. Crest and henderson people doing burn outs in the park has no speed bumps.
56			1				Uriarra/Kendall/Richard						1	Uriarra/Kendall/Richard															1	Uriarra/Ross/ Crest/Crawfo rd			To many high rise cant get parking in riverside have to park in woolworths. Buses have to be better (to expensive) have to wait two hours in bewtween buses in afternoon
57							Uriarra/Railway ave beacause council allows cars to park on Uriarra blocking vision of approaching traffic from the right. Most mornings this is causes major visual impairment							Uriarra/Railway Trying to get into my driveway due to cars parked along the curb on both sides of a narrow street								1	All side roads including Derrima	1	All side roads including Derrima	1	Side roads including Derrima			1	Too many cars parked along side streets causing cyclists to ride in middle of the rode	Poor planning and unfair and improper management of infilling has lead to a higher than safe car density using and parked in side roads, including Derrima and railway ave. Please stop the infilling. This is a heritage neighbourhood go build somewhere else please.
58	1				1															1	Corner of Uriarra rd and Crawford/Corner of crawford and moore st/Corner of crawford and erin st												I walk into QBN everyday with my baby in a pram, I find myself balancing on small concrete islands in busy traffic, I physically have to pick up the pram to get it over these islands, need safe waiting islands for pedestrians
59													1			1	Hotel QBN	1	Morton st/Richard ave at west QBN school										1	Should be off the road and footpath		The roads are too narrow and cyclists should not be allowed on uriarra rd at all
60	1	1	1						1	1	1			Also experience delays turning right onto Uriarra rd place during peak hour																				The intersection of morton st and crest rd is quite dangerous, although it is not in the study area I have nearly been hit by multiple vehicles as they are unaware there is one corner that does not have a stop sign and is right of way
61			1											Federal ave turning onto ross rd														1		1	Where the lawn motor business is its unsafe to turn from federal ave onto Uriarra rd as there is a lane there for cars to park and its hard to see oncoming cars if that's has cars parked there. Its like a blind spot, very difficult	
62							Corner Morton st and Richard ave																	1	Morton st outside # 107 upwards			1	Morton st and richard ave				The intersection at Morton st and Richard ave is extremely dangerous, I have been living there for 8 months and have seen 5 bad accidents either need stop signs or a roundabout. Its right near the school and kids will be hurt
63				1								1	1				1	General proximity to bus stops									1			Uriarra/Black all wuth exit from BP bend in road etc			During busy times its possible to wait a long time to turn right from Blackall to Uriarra - traffic lights (even just at peak times) would help
	21 33%	22 35%	27 43%	18 29%	33 52%	6 10%		17 27%	22 35%	28 44%	15 24%	34 54%	5 8%		26 41%		9 14%		10 16%		16 25%		14 22%		19 30%		14 22%									

draft

Appendix F

2031 Base Operational Assessment SIDRA Results

LANE SUMMARY

Site: Uriarra Road / Young Street 2031 Base AM - RT Gaps 5/4

JS10760
Uriarra Road / Young Street
2031 Base Weekday AM
RT Gaps 5/4
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Uriarra Road E Appr																
Lane 1	0	1195	5	1200	3.0	1902	0.631	100	8.5	LOS A	17.2	123.6	500	–	0.0	0.0
Approach	0	1195	5	1200	3.0		0.631		8.5	NA	17.2	123.6				
North: Young Street N Appr																
Lane 1	13	0	0	13	8.3	332[1]	0.039	100	10.3	LOS A	0.1	0.5	7	Turn Bay	0.0	0.0
Lane 2	0	0	55	55	0.0	78	0.701	100	74.4	LOS F	2.1	15.0	500	–	0.0	0.0
Approach	13	0	55	68	1.6		0.701		62.2	LOS E	2.1	15.0				
West: Uriarra Road W Appr																
Lane 1	27	420	0	447	8.6	1841	0.243	100	0.5	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	27	420	0	447	8.6		0.243		0.5	NA	0.0	0.0				
Intersection				1715	4.4		0.701		8.6	NA	17.2	123.6				

LANE SUMMARY

Site: Uriarra Road / Young Street 2031 Base PM - RT Gaps 5/4

JS10760
Uriarra Road / Young Street
2031 Base Weekday PM
RT Gaps 5/4
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Uriarra Road E Appr																
Lane 1	0	551	7	558	3.4	1500	0.372	100	72.2	LOS F	21.2	152.5	500	–	0.0	0.0
Approach	0	551	7	558	3.4		0.372		72.2	NA	21.2	152.5				
North: Young Street N Appr																
Lane 1	10	0	0	10	0.0	60	0.170	100	63.6	LOS E	0.4	3.1	7	Turn Bay	0.0	0.0
Lane 2	0	0	24	24	4.2	36	0.672	100	144.7	LOS F	1.8	12.8	500	–	0.0	0.0
Approach	10	0	24	35	2.9		0.672		120.9	LOS F	1.8	12.8				
West: Uriarra Road W Appr																
Lane 1	63	1331	0	1394	2.4	1916	0.728	100	0.3	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	63	1331	0	1394	2.4		0.728		0.3	NA	0.0	0.0				
Intersection				1987	2.7		0.728		22.6	NA	21.2	152.5				

LANE SUMMARY

Site: Uriarra Road / Frederick Street / McKeahnie Street 2031 Base AM - RT Gaps 6/4

JS10760
Uriarra Road / Frederick Street / McKeahnie Street
2031 Base Weekday AM
RT Gaps 6/4
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Frederick Street																
Lane 1	56	0	0	56	1.9	174	0.322	100	30.2	LOS C	1.0	7.4	500	–	0.0	0.0
Lane 2	0	1	11	12	0.0	75	0.158	100	52.5	LOS D	0.4	3.0	7	Turn Bay	0.0	0.0
Approach	56	1	11	68	1.6		0.322		34.1	LOS C	1.0	7.4				
East: Uriarra Road E Appr																
Lane 1	24	1083	2	1109	3.4	1901	0.583	100	7.3	LOS A	14.4	104.1	500	–	0.0	0.0
Approach	24	1083	2	1109	3.4		0.583		7.3	NA	14.4	104.1				
North: McKeahnie Street																
Lane 1	9	0	0	9	0.0	365[1]	0.024	100	9.8	LOS A	0.0	0.3	7	Turn Bay	0.0	0.0
Lane 2	0	1	41	42	0.0	74	0.568	100	75.7	LOS F	1.8	12.7	500	–	0.0	0.0
Approach	9	1	41	51	0.0		0.568		64.4	LOS E	1.8	12.7				
West: Uriarra Road W Appr																
Lane 1	5	429	1	435	8.9	1813	0.240	100	20.0	LOS B	6.8	51.6	500	–	0.0	0.0
Approach	5	429	1	435	8.9		0.240		20.0	NA	6.8	51.6				
Intersection				1662	4.7		0.583		13.5	NA	14.4	104.1				

LANE SUMMARY

Site: Uriarra Road / Frederick Street / McKeahnie Street 2031 Base PM - RT Gaps 6/4

JS10760
Uriarra Road / Frederick Street / McKeahnie Street
2031 Base Weekday PM
RT Gaps 6/4
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Frederick Street																
Lane 1	9	0	0	9	0.0	606	0.015	100	10.8	LOS A	0.1	0.4	500	–	0.0	0.0
Lane 2	0	1	6	7	0.0	30	0.238	100	128.2	LOS F	0.6	4.3	7	Turn Bay	0.0	0.0
Approach	9	1	6	16	0.0		0.238		62.1	LOS E	0.6	4.3				
East: Uriarra Road E Appr																
Lane 1	19	536	1	556	3.6	1849	0.301	100	48.4	LOS D	16.4	118.7	500	–	0.0	0.0
Approach	19	536	1	556	3.6		0.301		48.4	NA	16.4	118.7				
North: McKeahnie Street																
Lane 1	9	0	0	9	0.0	75	0.123	100	50.9	LOS D	0.3	2.3	7	Turn Bay	0.0	0.0
Lane 2	0	1	9	10	0.0	32	0.316	100	128.1	LOS F	0.8	5.8	500	–	0.0	0.0
Approach	9	1	9	19	0.0		0.316		91.5	LOS F	0.8	5.8				
West: Uriarra Road W Appr																
Lane 1	20	1306	10	1337	2.4	1896	0.705	100	14.0	LOS A	21.3	152.5	500	–	0.0	0.0
Approach	20	1306	10	1337	2.4		0.705		14.0	NA	21.3	152.5				
Intersection				1929	2.7		0.705		25.1	NA	21.3	152.5				

LANE SUMMARY

Site: Uriarra Road / Crest Road 2031 Base AM - RT Gaps 6/4

JS10760
Uriarra Road / Crest Road
2031 Base Weekday AM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Crest Road S Appr																
Lane 1	31	0	0	31	0.0	224	0.138	100	22.0	LOS B	0.4	2.9	500	–	0.0	0.0
Approach	31	0	0	31	0.0		0.138		22.0	LOS B	0.4	2.9				
East: Uriarra Road E Appr																
Lane 1	12	1005	0	1017	3.5	1906	0.534	100	0.1	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	10	10	0.0	867	0.011	100	9.7	LOS A	0.0	0.3	35	Turn Bay	0.0	0.0
Approach	12	1005	10	1027	3.5		0.534		0.2	NA	0.0	0.3				
North: Crest Road N Appr																
Lane 1	15	0	0	15	0.0	693	0.021	100	9.9	LOS A	0.1	0.5	21	Turn Bay	0.0	0.0
Lane 2	0	1	50	51	2.1	88	0.578	100	65.0	LOS E	1.9	13.7	500	–	0.0	0.0
Approach	15	1	50	66	1.6		0.578		52.6	LOS D	1.9	13.7				
West: Uriarra Road W Appr																
Lane 1	7	439	0	447	8.2	1850	0.242	100	0.1	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	7	7	0.0	312	0.024	100	17.9	LOS B	0.1	0.5	25	Turn Bay	0.0	0.0
Approach	7	439	7	454	8.1		0.242		0.4	NA	0.1	0.5				
Intersection				1578	4.6		0.578		2.9	NA	1.9	13.7				

LANE SUMMARY

Site: Uriarra Road / Crest Road 2031 Base PM - RT Gaps 6/4

JS10760
Uriarra Road / Crest Road
2031 Base Weekday PM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Crest Road S Appr																
Lane 1	11	0	0	11	0.0	606	0.019	100	10.8	LOS A	0.1	0.4	500	–	0.0	0.0
Approach	11	0	0	11	0.0		0.019		10.8	LOS A	0.1	0.4				
East: Uriarra Road E Appr																
Lane 1	14	539	0	552	3.5	1904	0.290	100	0.2	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	26	26	0.0	116	0.225	100	40.0	LOS C	0.7	4.6	35	Turn Bay	0.0	0.0
Approach	14	539	26	578	3.4		0.290		2.0	NA	0.7	4.6				
North: Crest Road N Appr																
Lane 1	20	0	0	20	0.0	75	0.262	100	56.8	LOS E	0.7	5.0	21	Turn Bay	0.0	0.0
Lane 2	0	1	19	20	0.0	36	0.556	100	145.6	LOS F	1.6	10.9	500	–	0.0	0.0
Approach	20	1	19	40	0.0		0.556		101.2	LOS F	1.6	10.9				
West: Uriarra Road W Appr																
Lane 1	22	1303	0	1325	2.5	1917	0.691	100	0.1	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	21	21	5.0	759	0.027	100	10.8	LOS A	0.1	0.7	25	Turn Bay	0.0	0.0
Approach	22	1303	21	1346	2.6		0.691		0.3	NA	0.1	0.7				
Intersection				1975	2.7		0.691		2.9	NA	1.6	10.9				

LANE SUMMARY

Site: Uriarra Road / Blackall Avenue 2031 Base AM - RT Gaps 6/4

JS10760
Uriarra Road / Blackall Ave
2031 Base Weekday AM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Blackall Avenue																
Lane 1	51	0	0	51	2.1	252	0.203	100	21.0	LOS B	0.6	4.6	500	–	0.0	0.0
Lane 2	0	0	35	35	3.0	100	0.352	100	48.0	LOS D	1.1	7.7	15	Turn Bay	0.0	0.0
Approach	51	0	35	86	2.5		0.352		32.0	LOS C	1.1	7.7				
East: Uriarra Road E Appr																
Lane 1	16	960	0	976	3.3	1908	0.511	100	0.1	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	16	960	0	976	3.3		0.511		0.1	NA	0.0	0.0				
West: Uriarra Road W Appr																
Lane 1	0	442	0	442	7.6	1859	0.238	100	0.0	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	22	6	28	9.6	772	0.037	16[7]	15.4	LOS B	0.4	2.7	25	Turn Bay	0.0	0.0
Approach	0	464	6	470	7.7		0.238		0.9	NA	0.4	2.7				
Intersection				1532	4.6		0.511		2.2	NA	1.1	7.7				

LANE SUMMARY

Site: Uriarra Road / Blackall Avenue 2031 Base PM

JS10760
Uriarra Road / Blackall Ave
2031 Base Weekday PM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Blackall Avenue																
Lane 1	17	0	0	17	0.0	563	0.031	100	11.3	LOS A	0.1	0.7	500	–	0.0	0.0
Lane 2	0	0	15	15	0.0	38	0.403	100	117.2	LOS F	1.1	7.6	15	Turn Bay	0.0	0.0
Approach	17	0	15	33	0.0		0.403		61.0	LOS E	1.1	7.6				
East: Uriarra Road E Appr																
Lane 1	28	576	0	603	3.5	1901	0.317	100	0.3	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	28	576	0	603	3.5		0.317		0.3	NA	0.0	0.0				
West: Uriarra Road W Appr																
Lane 1	0	1189	0	1189	2.4	1920	0.619	100	0.0	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	77	36	112	1.6	1242	0.090	15[7]	6.2	LOS A	0.6	4.3	25	Turn Bay	0.0	0.0
Approach	0	1265	36	1301	2.3		0.619		0.5	NA	0.6	4.3				
Intersection				1937	2.7		0.619		1.5	NA	1.1	7.6				

LANE SUMMARY

Site: Uriarra Road / Ross Road 2031 Base AM - RT&T T=6

JS10760
Uriarra Road / Ross Road
2031 Base Weekday AM
RT&T - T = 6s
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Ross Road S Appr																
Lane 1	92	0	0	92	1.1	293	0.312	100	23.2	LOS B	1.1	7.9	15	Turn Bay	0.0	0.0
Lane 2	0	61	13	74	1.4	107	0.689	100	69.9	LOS E	2.8	19.7	500	–	0.0	0.0
Approach	92	61	13	165	1.3		0.689		44.1	LOS D	2.8	19.7				
East: Uriarra Road E Appr																
Lane 1	35	891	0	926	3.5	1903	0.487	100	0.3	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	8	8	0.0	832	0.009	100	9.9	LOS A	0.0	0.2	30	Turn Bay	0.0	0.0
Approach	35	891	8	934	3.5		0.487		0.4	NA	0.0	0.2				
North: Ross Road N Appr																
Lane 1	12	0	0	12	9.1	316[1]	0.037	100	13.8	LOS A	0.1	0.5	7	Turn Bay	0.0	0.0
Lane 2	0	12	4	16	6.6	90	0.176	100	49.5	LOS D	0.5	3.8	500	–	0.0	0.0
Approach	12	12	4	28	7.7		0.176		34.2	LOS C	0.5	3.8				
West: Uriarra Road W Appr																
Lane 1	14	465	0	478	7.7	1855	0.258	100	0.2	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	24	24	0.0	387	0.063	100	15.6	LOS B	0.2	1.4	60	Turn Bay	0.0	0.0
Approach	14	465	24	503	7.3		0.258		1.0	NA	0.2	1.4				
Intersection				1629	4.5		0.689		5.6	NA	2.8	19.7				

LANE SUMMARY

Site: Uriarra Road / Ross Road 2031 Base PM - RT&T T=6

JS10760
Uriarra Road / Ross Road
2031 Base Weekday PM
RT&T T=6s
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Ross Road S Appr																
Lane 1	36	0	0	36	2.9	520[1]	0.069	100	14.4	LOS A	0.2	1.5	15	Turn Bay	0.0	0.0
Lane 2	0	18	30	48	0.0	48[2]	1.000[4]	100	266.7	LOS F	5.9	41.3	500	–	0.0	0.0
Approach	36	18	30	84	1.2		1.000		159.0	LOS F	5.9	41.3				
East: Uriarra Road E Appr																
Lane 1	50	553	0	603	3.3	1901	0.317	100	0.6	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	11	11	0.0	170	0.066	100	27.4	LOS B	0.2	1.4	30	Turn Bay	0.0	0.0
Approach	50	553	11	614	3.3		0.317		1.1	NA	0.2	1.4				
North: Ross Road N Appr																
Lane 1	15	0	0	15	6.7	86[1]	0.178	100	42.8	LOS D	0.4	3.0	7	Turn Bay	0.0	0.0
Lane 2	0	22	5	28	0.0	40	0.689	100	165.5	LOS F	2.2	15.2	500	–	0.0	0.0
Approach	15	22	5	43	2.4		0.689		121.7	LOS F	2.2	15.2				
West: Uriarra Road W Appr																
Lane 1	16	1207	0	1223	2.3	1920	0.637	100	0.1	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	59	59	3.4	706	0.084	100	11.1	LOS A	0.3	2.2	60	Turn Bay	0.0	0.0
Approach	16	1207	59	1283	2.4		0.637		0.6	NA	0.3	2.2				
Intersection				2023	2.6		1.000		9.9	NA	5.9	41.3				

LANE SUMMARY

Site: Uriarra Road / Crawford Street 2031 Base AM - RT Gaps 5.5/4

JS10760
Uriarra Road / Crawford Street
2031 Base Weekday AM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Crawford Street																
Lane 1	0	773	0	773	4.4	1895	0.408	100	0.0	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	116	116	1.8	783	0.148	100	10.6	LOS A	0.6	4.0	40	Turn Bay	0.0	0.0
Approach	0	773	116	888	4.1		0.408		1.4	NA	0.6	4.0				
North: Crawford Street																
Lane 1	36	0	0	36	5.9	631	0.057	100	10.8	LOS A	0.2	1.4	21	Turn Bay	0.0	0.0
Lane 2	0	0	66	66	1.6	138	0.479	100	38.4	LOS C	1.6	11.0	500	–	0.0	0.0
Approach	36	0	66	102	3.1		0.479		28.7	LOS C	1.6	11.0				
West: Uriarra Road																
Lane 1	53	471	0	523	7.0	1855	0.282	100	0.8	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	53	471	0	523	7.0		0.282		0.8	NA	0.0	0.0				
Intersection				1514	5.0		0.479		3.0	NA	1.6	11.0				

LANE SUMMARY

Site: Uriarra Road / Crawford Street 2031 Base PM - RT Gaps 5/4

JS10760
Uriarra Road / Crawford Street
2031 Base Weekday PM
RT Gaps 5/4
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Crawford Street																
Lane 1	0	552	0	552	3.4	1908	0.289	100	0.0	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	57	57	1.8	213	0.266	100	26.0	LOS B	0.9	6.2	40	Turn Bay	0.0	0.0
Approach	0	552	57	608	3.2		0.289		2.4	NA	0.9	6.2				
North: Crawford Street																
Lane 1	68	0	0	68	1.5	154	0.439	100	36.3	LOS C	1.5	10.4	21	Turn Bay	0.0	0.0
Lane 2	0	0	103	103	1.0	98	1.051	100	157.8	LOS F	8.7	61.6	500	–	0.0	0.0
Approach	68	0	103	171	1.2		1.051		109.6	LOS F	8.7	61.6				
West: Uriarra Road																
Lane 1	43	1110	0	1154	2.3	1917	0.602	100	0.3	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	43	1110	0	1154	2.3		0.602		0.3	NA	0.0	0.0				
Intersection				1932	2.5		1.051		10.6	NA	8.7	61.6				

LANE SUMMARY

Site: Campbell Street / Collett Street 2031 Base AM

JS10760
Campbell Street / Collett Street
2031 Base Weekday AM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Campbell Street																
Lane 1	5	5	7	18	11.8	1477	0.012	100	5.3	LOS A	0.1	0.4	500	–	0.0	0.0
Approach	5	5	7	18	11.8		0.012		5.3	NA	0.1	0.4				
East: Collett Street																
Lane 1	9	35	129	174	0.0	797	0.218	100	7.6	LOS A	1.0	6.9	500	–	0.0	0.0
Approach	9	35	129	174	0.0		0.218		7.6	LOS A	1.0	6.9				
North: Campbell Street																
Lane 1	92	45	1	138	3.8	1833	0.075	100	4.4	LOS A	0.4	2.9	500	–	0.0	0.0
Approach	92	45	1	138	3.8		0.075		4.4	NA	0.4	2.9				
West: Collett Street																
Lane 1	1	12	3	16	13.3	753	0.021	100	7.1	LOS A	0.1	0.6	500	–	0.0	0.0
Approach	1	12	3	16	13.3		0.021		7.1	LOS A	0.1	0.6				
Intersection				345	2.7		0.218		6.2	NA	1.0	6.9				

LANE SUMMARY

Site: Campbell Street / Collett Street 2031 Base PM

JS10760
Campbell Street / Collett Street
2031 Base Weekday PM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Campbell Street																
Lane 1	2	4	10	16	0.0	1199	0.013	100	6.6	LOS A	0.1	0.4	500	–	0.0	0.0
Approach	2	4	10	16	0.0		0.013		6.6	NA	0.1	0.4				
East: Collett Street																
Lane 1	13	69	149	231	0.5	614	0.376	100	10.8	LOS A	2.1	15.0	500	–	0.0	0.0
Approach	13	69	149	231	0.5		0.376		10.8	LOS A	2.1	15.0				
North: Campbell Street																
Lane 1	226	157	2	385	1.4	1874	0.205	100	3.8	LOS A	1.3	9.0	500	–	0.0	0.0
Approach	226	157	2	385	1.4		0.205		3.8	NA	1.3	9.0				
West: Collett Street																
Lane 1	1	17	4	23	0.0	594	0.038	100	8.9	LOS A	0.1	1.0	500	–	0.0	0.0
Approach	1	17	4	23	0.0		0.038		8.9	LOS A	0.1	1.0				
Intersection				655	1.0		0.376		6.5	NA	2.1	15.0				

LANE SUMMARY

Site: Henderson Road / McEwan Avenue 2031 Base AM

JS10760
Henderson Road / McEwan Avenue
2031 Base Weekday AM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Henderson Road																
Lane 1	0	29	111	140	0.0	1181	0.119	100	6.7	LOS A	0.5	3.8	500	–	0.0	0.0
Approach	0	29	111	140	0.0		0.119		6.7	NA	0.5	3.8				
North: McEwan Avenue																
Lane 1	95	0	29	124	4.4	844	0.147	100	8.2	LOS A	0.6	4.2	500	–	0.0	0.0
Approach	95	0	29	124	4.4		0.147		8.2	LOS A	0.6	4.2				
West: Henderson Road																
Lane 1	243	49	0	292	1.1	1858	0.157	100	5.4	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	243	49	0	292	1.1		0.157		5.4	NA	0.0	0.0				
Intersection				557	1.6		0.157		6.3	NA	0.6	4.2				

LANE SUMMARY

Site: Henderson Road / McEwan Avenue 2031 Base PM

JS10760
Henderson Road / McEwan Avenue
2031 Base Weekday PM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Henderson Road																
Lane 1	0	79	62	141	0.0	1589	0.089	100	3.4	LOS A	0.5	3.2	500	–	0.0	0.0
Approach	0	79	62	141	0.0		0.089		3.4	NA	0.5	3.2				
North: McEwan Avenue																
Lane 1	343	0	133	476	1.4	922	0.516	100	8.5	LOS A	3.7	26.1	500	–	0.0	0.0
Approach	343	0	133	476	1.4		0.516		8.5	LOS A	3.7	26.1				
West: Henderson Road																
Lane 1	80	42	0	122	2.7	1855	0.066	100	4.2	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	80	42	0	122	2.7		0.066		4.2	NA	0.0	0.0				
Intersection				738	1.3		0.516		6.9	NA	3.7	26.1				

draft

Appendix G

Appendix G

2031 Post Development Operational Assessment Sidra Results - No Change to Existing Road Network

LANE SUMMARY

Site: Uriarra Road / Young Street 2031 Post Dev AM - RT Gaps 5/4

JS10760
Uriarra Road / Young Street
2031 Post Dev AM
RT Gaps 5/4
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Uriarra Road E Appr																
Lane 1	0	1368	8	1375	2.9	1900	0.724	100	12.6	LOS A	22.6	162.2	500	–	0.0	0.0
Approach	0	1368	8	1375	2.9		0.724		12.6	NA	22.6	162.2				
North: Young Street N Appr																
Lane 1	20	0	0	20	3.8	349[1]	0.059	100	10.2	LOS A	0.1	0.7	7	Turn Bay	0.0	0.0
Lane 2	0	0	87	87	0.0	60[2]	1.452	100	503.9	LOS F	20.9	146.5	500	–	0.0	0.0
Approach	20	0	87	108	0.7		1.452		410.1	LOS F	20.9	146.5				
West: Uriarra Road W Appr																
Lane 1	38	442	0	480	7.7	1850	0.259	100	0.6	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	38	442	0	480	7.7		0.259		0.6	NA	0.0	0.0				
Intersection				1962	4.0		1.452		31.5	NA	22.6	162.2				

LANE SUMMARY

Site: Uriarra Road / Young Street 2031 Post Dev PM - RT Gaps 5/4

JS10760
Uriarra Road / Young Street
Future Weekday PM
RT Gaps 6/4
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Uriarra Road E Appr																
Lane 1	0	602	10	612	3.3	1145	0.535	100	176.9	LOS F	39.8	286.4	500	–	0.0	0.0
Approach	0	602	10	612	3.3		0.535		176.9	NA	39.8	286.4				
North: Young Street N Appr																
Lane 1	15	0	0	15	0.0	34	0.448	100	135.8	LOS F	1.2	8.2	7	Turn Bay	0.0	9.8
Lane 2	0	0	38	38	1.3	38[2]	1.000[4]	100	232.7	LOS F	3.9	27.6	500	–	0.0	0.0
Approach	15	0	38	53	0.9		1.000		204.8	LOS F	3.9	27.6				
West: Uriarra Road W Appr																
Lane 1	93	1418	0	1511	2.3	1915	0.789	100	0.5	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	93	1418	0	1511	2.3		0.789		0.5	NA	0.0	0.0				
Intersection				2177	2.5		1.000		55.1	NA	39.8	286.4				

LANE SUMMARY

Site: Uriarra Road / Frederick Street / McKeahnie Street 2031 Post Dev AM - RT Gaps 6/4

JS10760
Uriarra Road / Frederick Street / McKeahnie Street
2031 Post Dev AM
RT Gaps 6/4
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Frederick Street																
Lane 1	86	0	0	86	1.5	105	0.822	100	83.4	LOS F	3.5	24.5	500	–	0.0	0.0
Lane 2	0	2	16	18	0.0	49	0.374	100	92.7	LOS F	1.0	7.3	7	Turn Bay	0.0	6.4
Approach	86	2	16	104	1.2		0.822		85.0	LOS F	3.5	24.5				
East: Uriarra Road E Appr																
Lane 1	29	1223	2	1254	3.3	1902	0.659	100	9.9	LOS A	18.9	136.0	500	–	0.0	0.0
Approach	29	1223	2	1254	3.3		0.659		9.9	NA	18.9	136.0				
North: McKeahnie Street																
Lane 1	10	0	0	10	0.0	356[1]	0.027	100	10.1	LOS A	0.0	0.3	7	Turn Bay	0.0	0.0
Lane 2	0	1	46	47	0.0	48	0.987	100	223.9	LOS F	4.9	34.1	500	–	0.0	0.0
Approach	10	1	46	57	0.0		0.987		187.5	LOS F	4.9	34.1				
West: Uriarra Road W Appr																
Lane 1	8	457	1	466	8.1	1805	0.258	100	33.6	LOS C	10.5	78.9	500	–	0.0	0.0
Approach	8	457	1	466	8.1		0.258		33.6	NA	10.5	78.9				
Intersection				1881	4.3		0.987		25.3	NA	18.9	136.0				

LANE SUMMARY

Site: Uriarra Road / Frederick Street / McKeahnie Street 2031 Post Dev PM - RT Gaps 6/4

JS10760
Uriarra Road / Frederick Street / McKeahnie Street
2031 Post Dev PM
RT Gaps 6/4
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Frederick Street																
Lane 1	18	0	0	18	0.0	554	0.033	100	11.5	LOS A	0.1	0.8	500	–	0.0	0.0
Lane 2	0	2	12	14	0.0	19	0.741	100	323.5	LOS F	2.1	14.5	7	Turn Bay	0.0	34.6
Approach	18	2	12	33	0.0		0.741		148.0	LOS F	2.1	14.5				
East: Uriarra Road E Appr																
Lane 1	38	580	1	618	3.4	1833	0.337	100	73.8	LOS F	25.5	183.6	500	–	0.0	0.0
Approach	38	580	1	618	3.4		0.337		73.8	NA	25.5	183.6				
North: McKeahnie Street																
Lane 1	10	0	0	10	0.0	50	0.202	100	76.1	LOS F	0.5	3.6	7	Turn Bay	0.0	0.0
Lane 2	0	2	10	12	0.0	18	0.678	100	321.4	LOS F	1.8	12.9	500	–	0.0	0.0
Approach	10	2	10	22	0.0		0.678		209.9	LOS F	1.8	12.9				
West: Uriarra Road W Appr																
Lane 1	27	1383	20	1430	2.4	1871	0.764	100	20.7	LOS B	25.4	181.4	500	–	0.0	0.0
Approach	27	1383	20	1430	2.4		0.764		20.7	NA	25.4	181.4				
Intersection				2103	2.6		0.764		40.3	NA	25.5	183.6				

LANE SUMMARY

Site: Uriarra Road / Crest Road 2031 Post Dev AM - RT Gaps 6/4

JS10760
Uriarra Road / Crest Road
2031 Post Dev AM
RT Gaps 6/4
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Crest Road S Appr																
Lane 1	87	0	0	87	0.0	174	0.502	100	34.7	LOS C	1.8	12.6	500	–	0.0	0.0
Approach	87	0	0	87	0.0		0.502		34.7	LOS C	1.8	12.6				
East: Uriarra Road E Appr																
Lane 1	24	1083	0	1107	3.3	1907	0.581	100	0.2	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	11	11	0.0	837	0.013	100	9.9	LOS A	0.0	0.3	35	Turn Bay	0.0	0.0
Approach	24	1083	11	1118	3.3		0.581		0.3	NA	0.0	0.3				
North: Crest Road N Appr																
Lane 1	20	0	0	20	0.0	668	0.030	100	10.2	LOS A	0.1	0.7	21	Turn Bay	0.0	0.0
Lane 2	0	1	67	68	1.2	60[2]	1.135	100	276.4	LOS F	9.8	69.0	500	–	0.0	0.0
Approach	20	1	67	88	0.9		1.135		215.5	LOS F	9.8	69.0				
West: Uriarra Road W Appr																
Lane 1	9	466	0	474	7.6	1857	0.256	100	0.1	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	16	16	0.0	244	0.065	100	21.4	LOS B	0.2	1.4	25	Turn Bay	0.0	0.0
Approach	9	466	16	490	7.3		0.256		0.8	NA	0.2	1.4				
Intersection				1784	4.1		1.135		12.7	NA	9.8	69.0				

LANE SUMMARY

Site: Uriarra Road / Crest Road 2031 Post Dev PM - RT Gaps 6/4

JS10760
Uriarra Road / Crest Road
2031 Post Dev PM
RT Gaps 6/4
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Crest Road S Appr																
Lane 1	38	0	0	38	0.0	565	0.066	100	11.5	LOS A	0.2	1.6	500	–	0.0	0.0
Approach	38	0	0	38	0.0		0.066		11.5	LOS A	0.2	1.6				
East: Uriarra Road E Appr																
Lane 1	32	571	0	603	3.3	1904	0.317	100	0.4	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	36	36	0.0	90	0.404	100	56.8	LOS E	1.2	8.4	35	Turn Bay	0.0	0.0
Approach	32	571	36	640	3.1		0.404		3.6	NA	1.2	8.4				
North: Crest Road N Appr																
Lane 1	25	0	0	25	0.0	58	0.428	100	81.7	LOS F	1.2	8.3	21	Turn Bay	0.0	0.0
Lane 2	0	1	24	25	0.0	25[2]	1.000[4]	100	373.9	LOS F	4.1	28.7	500	–	0.0	0.0
Approach	25	1	24	50	0.0		1.000		227.8	LOS F	4.1	28.7				
West: Uriarra Road W Appr																
Lane 1	31	1352	0	1383	2.5	1917	0.722	100	0.2	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	49	49	3.8	706	0.069	100	11.3	LOS A	0.3	1.8	25	Turn Bay	0.0	0.0
Approach	31	1352	49	1432	2.5		0.722		0.5	NA	0.3	1.8				
Intersection				2159	2.6		1.000		6.9	NA	4.1	28.7				

LANE SUMMARY

Site: Uriarra Road / Blackall Avenue 2031 Post Dev AM - RT Gaps 6/4

JS10760
Uriarra Road / Blackall Ave
2031 Post Dev AM
RT Gaps 6/4
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Blackall Avenue																
Lane 1	61	0	0	61	1.7	212	0.286	100	25.4	LOS B	0.9	6.7	500	–	0.0	0.0
Lane 2	0	0	41	41	2.4	82	0.507	100	64.8	LOS E	1.6	11.4	15	Turn Bay	0.0	0.0
Approach	61	0	41	102	2.0		0.507		41.4	LOS C	1.6	11.4				
East: Uriarra Road E Appr																
Lane 1	19	1020	0	1039	3.2	1909	0.544	100	0.1	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	19	1020	0	1039	3.2		0.544		0.1	NA	0.0	0.0				
West: Uriarra Road W Appr																
Lane 1	0	483	0	483	7.0	1865	0.259	100	0.0	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	17	7	24	8.7	604	0.040	15[7]	17.1	LOS B	0.3	2.4	25	Turn Bay	0.0	0.0
Approach	0	500	7	507	7.1		0.259		0.8	NA	0.3	2.4				
Intersection				1649	4.3		0.544		2.9	NA	1.6	11.4				

LANE SUMMARY

Site: Uriarra Road / Blackall Avenue 2031 Post Dev PM - RT Gaps 6/4

JS10760
Uriarra Road / Blackall Ave
2031 Post Dev PM
RT Gaps 6/4
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Blackall Avenue																
Lane 1	21	0	0	21	0.0	509	0.042	100	12.2	LOS A	0.1	1.0	500	–	0.0	0.0
Lane 2	0	0	19	19	0.0	28	0.690	100	210.6	LOS F	2.0	13.7	15	Turn Bay	0.0	2.4
Approach	21	0	19	41	0.0		0.690		106.4	LOS F	2.0	13.7				
East: Uriarra Road E Appr																
Lane 1	34	631	0	664	3.4	1903	0.349	100	0.4	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	34	631	0	664	3.4		0.349		0.4	NA	0.0	0.0				
West: Uriarra Road W Appr																
Lane 1	0	1272	0	1272	2.4	1921	0.662	100	0.0	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	54	44	98	1.3	1015	0.097	15[7]	7.8	LOS A	0.6	4.1	25	Turn Bay	0.0	0.0
Approach	0	1327	44	1370	2.3		0.662		0.6	NA	0.6	4.1				
Intersection				2076	2.6		0.690		2.6	NA	2.0	13.7				

LANE SUMMARY

Site: Uriarra Road / Ross Road 2031 Post Dev AM - RT Gaps 6/4

JS10760
Uriarra Road / Ross Road
2031 Post Dev AM
RT Gaps 6/4
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Ross Road S Appr																
Lane 1	99	0	0	99	1.1	258	0.384	100	26.4	LOS B	1.4	9.9	15	Turn Bay	0.0	0.0
Lane 2	0	65	14	79	1.2	71	1.114	100	264.0	LOS F	10.7	75.4	500	–	0.0	0.0
Approach	99	65	14	178	1.1		1.114		131.8	LOS F	10.7	75.4				
East: Uriarra Road E Appr																
Lane 1	37	941	0	978	3.4	1904	0.513	100	0.3	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	10	10	0.0	787	0.012	100	10.2	LOS A	0.0	0.3	30	Turn Bay	0.0	0.0
Approach	37	941	10	987	3.4		0.513		0.4	NA	0.0	0.3				
North: Ross Road N Appr																
Lane 1	37	0	0	37	1.1	338[1]	0.108	100	13.6	LOS A	0.2	1.4	7	Turn Bay	0.0	0.0
Lane 2	0	36	13	49	0.8	68	0.716	100	111.2	LOS F	2.7	19.1	500	–	0.0	0.0
Approach	37	36	13	85	0.9		0.716		69.4	LOS E	2.7	19.1				
West: Uriarra Road W Appr																
Lane 1	17	503	0	520	7.0	1862	0.280	100	0.2	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	25	25	0.0	343	0.074	100	16.9	LOS B	0.2	1.7	60	Turn Bay	0.0	0.0
Approach	17	503	25	546	6.7		0.280		1.0	NA	0.2	1.7				
Intersection				1796	4.0		1.114		16.9	NA	10.7	75.4				

LANE SUMMARY

Site: Uriarra Road / Ross Road 2031 Post Dev PM - RT Gaps 6/4

JS10760
2031 Post Dev PM
RT Gaps 6/4
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Ross Road S Appr																
Lane 1	39	0	0	39	2.3	511	0.076	100	15.3	LOS B	0.3	1.8	15	Turn Bay	0.0	0.0
Lane 2	0	39	32	70	0.0	60[2]	1.173	100	335.0	LOS F	13.5	94.4	500	–	0.0	0.0
Approach	39	39	32	109	0.8		1.173		221.4	LOS F	13.5	94.4				
East: Uriarra Road E Appr																
Lane 1	54	618	0	672	3.2	1902	0.353	100	0.6	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	22	22	0.0	136	0.164	100	33.4	LOS C	0.5	3.3	30	Turn Bay	0.0	0.0
Approach	54	618	22	695	3.1		0.353		1.7	NA	0.5	3.3				
North: Ross Road N Appr																
Lane 1	26	0	0	26	1.1	93	0.275	100	51.2	LOS D	0.8	5.5	7	Turn Bay	0.0	0.0
Lane 2	0	39	8	47	0.0	47[2]	1.000[4]	100	282.2	LOS F	6.1	42.4	500	–	0.0	0.0
Approach	26	39	8	72	0.4		1.000		200.9	LOS F	6.1	42.4				
West: Uriarra Road W Appr																
Lane 1	34	1250	0	1284	2.2	1920	0.669	100	0.2	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	64	64	3.3	632	0.102	100	11.9	LOS A	0.4	2.6	60	Turn Bay	0.0	0.0
Approach	34	1250	64	1348	2.3		0.669		0.8	NA	0.4	2.6				
Intersection				2224	2.4		1.173		18.4	NA	13.5	94.4				

LANE SUMMARY

Site: Uriarra Road / Crawford Street 2031 Post Dev AM - RT Gaps 5.5/4

JS10760
Uriarra Road / Crawford Street
2031 Post Dev AM
RT Gaps 5.5/4
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Crawford Street																
Lane 1	0	811	0	811	4.2	1898	0.427	100	0.0	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	119	119	1.7	717	0.166	100	11.2	LOS A	0.6	4.5	40	Turn Bay	0.0	0.0
Approach	0	811	119	929	3.9		0.427		1.4	NA	0.6	4.5				
North: Crawford Street																
Lane 1	41	0	0	41	3.7	584	0.070	100	11.3	LOS A	0.2	1.7	21	Turn Bay	0.0	0.0
Lane 2	0	0	76	76	1.0	116	0.654	100	52.8	LOS D	2.3	16.2	500	–	0.0	0.0
Approach	41	0	76	117	2.0		0.654		38.2	LOS C	2.3	16.2				
West: Uriarra Road																
Lane 1	55	529	0	584	6.6	1861	0.314	100	0.7	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	55	529	0	584	6.6		0.314		0.7	NA	0.0	0.0				
Intersection				1631	4.7		0.654		3.8	NA	2.3	16.2				

LANE SUMMARY

Site: Uriarra Road / Crawford Street 2031 Post Dev PM - RT Gaps 5.5/4

JS10760
Uriarra Road / Crawford Street
2031 Post Dev PM
RT Gaps 5.5/4
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Crawford Street																
Lane 1	0	632	0	632	3.3	1909	0.331	100	0.0	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	64	64	1.5	179	0.355	100	31.5	LOS C	1.2	8.4	40	Turn Bay	0.0	0.0
Approach	0	632	64	696	3.1		0.355		2.9	NA	1.2	8.4				
North: Crawford Street																
Lane 1	71	0	0	71	1.2	129	0.549	100	46.2	LOS D	1.9	13.2	21	Turn Bay	0.0	0.0
Lane 2	0	0	107	107	0.7	60[2]	1.785	100	800.6	LOS F	34.5	242.8	500	–	0.0	0.0
Approach	71	0	107	178	0.9		1.785		500.6	LOS F	34.5	242.8				
West: Uriarra Road																
Lane 1	48	1159	0	1207	2.2	1918	0.629	100	0.3	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	48	1159	0	1207	2.2		0.629		0.3	NA	0.0	0.0				
Intersection				2081	2.4		1.785		43.9	NA	34.5	242.8				

LANE SUMMARY

Site: Campbell Street / Collett Street 2031 Post Dev AM

JS10760
Campbell Street / Collett Street
2031 Post Dev AM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Campbell Street																
Lane 1	6	5	8	20	11.6	1471	0.014	100	5.5	LOS A	0.1	0.5	500	–	0.0	0.0
Approach	6	5	8	20	11.6		0.014		5.5	NA	0.1	0.5				
East: Collett Street																
Lane 1	13	35	133	180	0.0	799	0.225	100	7.6	LOS A	1.0	7.2	500	–	0.0	0.0
Approach	13	35	133	180	0.0		0.225		7.6	LOS A	1.0	7.2				
North: Campbell Street																
Lane 1	92	45	1	138	3.8	1833	0.075	100	4.4	LOS A	0.4	2.9	500	–	0.0	0.0
Approach	92	45	1	138	3.8		0.075		4.4	NA	0.4	2.9				
West: Collett Street																
Lane 1	1	12	6	19	16.7	713	0.027	100	7.5	LOS A	0.1	0.8	500	–	0.0	0.0
Approach	1	12	6	19	16.7		0.027		7.5	LOS A	0.1	0.8				
Intersection				357	3.0		0.225		6.3	NA	1.0	7.2				

LANE SUMMARY

Site: Campbell Street / Collett Street 2031 Post Dev PM

JS10760
Campbell Street / Collett Street
2031 Post Dev PM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Campbell Street																
Lane 1	5	4	13	23	0.0	1207	0.019	100	7.1	LOS A	0.1	0.6	500	–	0.0	0.0
Approach	5	4	13	23	0.0		0.019		7.1	NA	0.1	0.6				
East: Collett Street																
Lane 1	15	69	155	239	0.5	607	0.393	100	11.2	LOS A	2.3	16.3	500	–	0.0	0.0
Approach	15	69	155	239	0.5		0.393		11.2	LOS A	2.3	16.3				
North: Campbell Street																
Lane 1	235	157	2	395	1.4	1873	0.211	100	3.9	LOS A	1.3	9.2	500	–	0.0	0.0
Approach	235	157	2	395	1.4		0.211		3.9	NA	1.3	9.2				
West: Collett Street																
Lane 1	1	17	6	25	0.0	584	0.042	100	9.1	LOS A	0.2	1.1	500	–	0.0	0.0
Approach	1	17	6	25	0.0		0.042		9.1	LOS A	0.2	1.1				
Intersection				681	1.0		0.393		6.8	NA	2.3	16.3				

LANE SUMMARY

Site: Henderson Road / McEwan Avenue 2031 Post Dev AM

JS10760
Henderson Road / McEwan Avenue
2031 Post Dev AM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Henderson Road																
Lane 1	0	29	114	143	0.0	1149	0.125	100	6.9	LOS A	0.6	4.0	500	–	0.0	0.0
Approach	0	29	114	143	0.0		0.125		6.9	NA	0.6	4.0				
North: McEwan Avenue																
Lane 1	96	0	39	135	4.3	799	0.169	100	8.5	LOS A	0.7	4.8	500	–	0.0	0.0
Approach	96	0	39	135	4.3		0.169		8.5	LOS A	0.7	4.8				
West: Henderson Road																
Lane 1	268	49	0	317	1.1	1857	0.171	100	5.4	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	268	49	0	317	1.1		0.171		5.4	NA	0.0	0.0				
Intersection				596	1.6		0.171		6.5	NA	0.7	4.8				

LANE SUMMARY

Site: Henderson Road / McEwan Avenue 2031 Post Dev PM

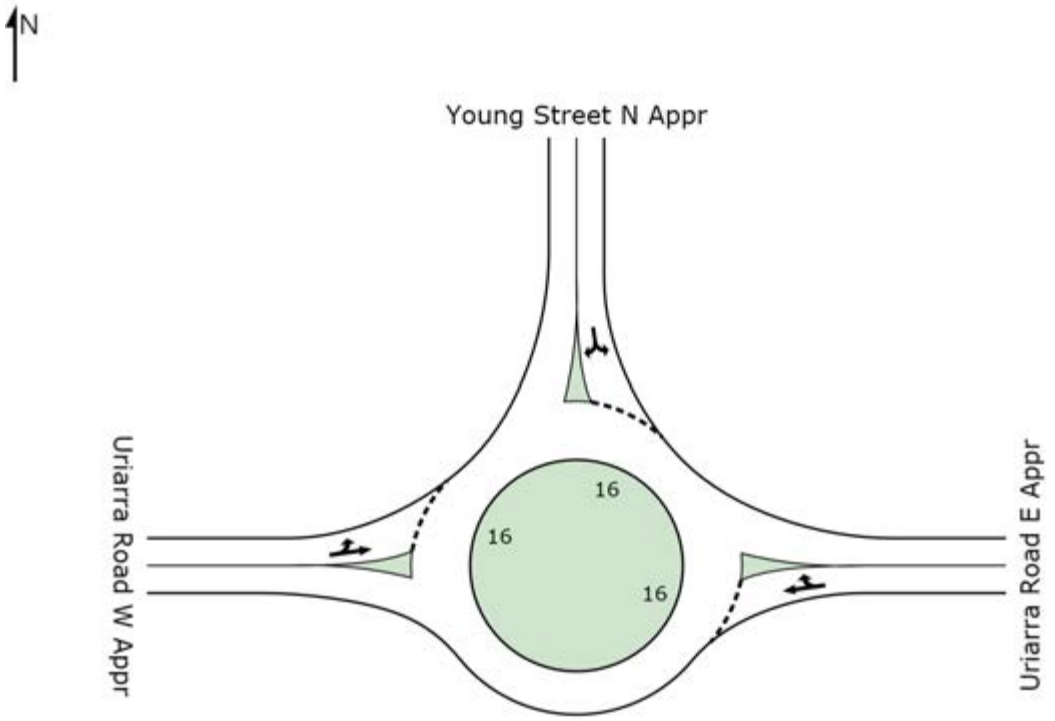
JS10760
Henderson Road / McEwan Avenue
2031 Post Dev PM
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Henderson Road																
Lane 1	0	79	67	146	0.0	1568	0.093	100	3.6	LOS A	0.5	3.4	500	–	0.0	0.0
Approach	0	79	67	146	0.0		0.093		3.6	NA	0.5	3.4				
North: McEwan Avenue																
Lane 1	353	0	136	489	1.4	915	0.534	100	8.9	LOS A	4.2	29.9	500	–	0.0	0.0
Approach	353	0	136	489	1.4		0.534		8.9	LOS A	4.2	29.9				
West: Henderson Road																
Lane 1	88	42	0	130	2.6	1854	0.070	100	4.4	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	88	42	0	130	2.6		0.070		4.4	NA	0.0	0.0				
Intersection				765	1.3		0.534		7.1	NA	4.2	29.9				

Appendix H

Options Development Operational Assessment



LANE SUMMARY

Site: Uriarra Road / Young Street 2031 Post Dev AM - Roundabout

JS10760
Uriarra Road / Young Street
2031 Post Dev AM Roundabout
Roundabout

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Uriarra Road E Appr																
Lane 1	0	1368	8	1375	2.9	1397	0.985	100	13.6	LOS A	49.3	353.7	500	–	0.0	0.0
Approach	0	1368	8	1375	2.9		0.985		13.6	LOS A	49.3	353.7				
North: Young Street N Appr																
Lane 1	20	0	87	108	0.7	860	0.125	100	12.3	LOS A	0.7	5.0	500	–	0.0	0.0
Approach	20	0	87	108	0.7		0.125		12.3	LOS A	0.7	5.0				
West: Uriarra Road W Appr																
Lane 1	38	442	0	480	7.7	1593	0.301	100	6.1	LOS A	2.7	19.9	500	–	0.0	0.0
Approach	38	442	0	480	7.7		0.301		6.1	LOS A	2.7	19.9				
Intersection				1962	4.0		0.985		11.7	LOS A	49.3	353.7				

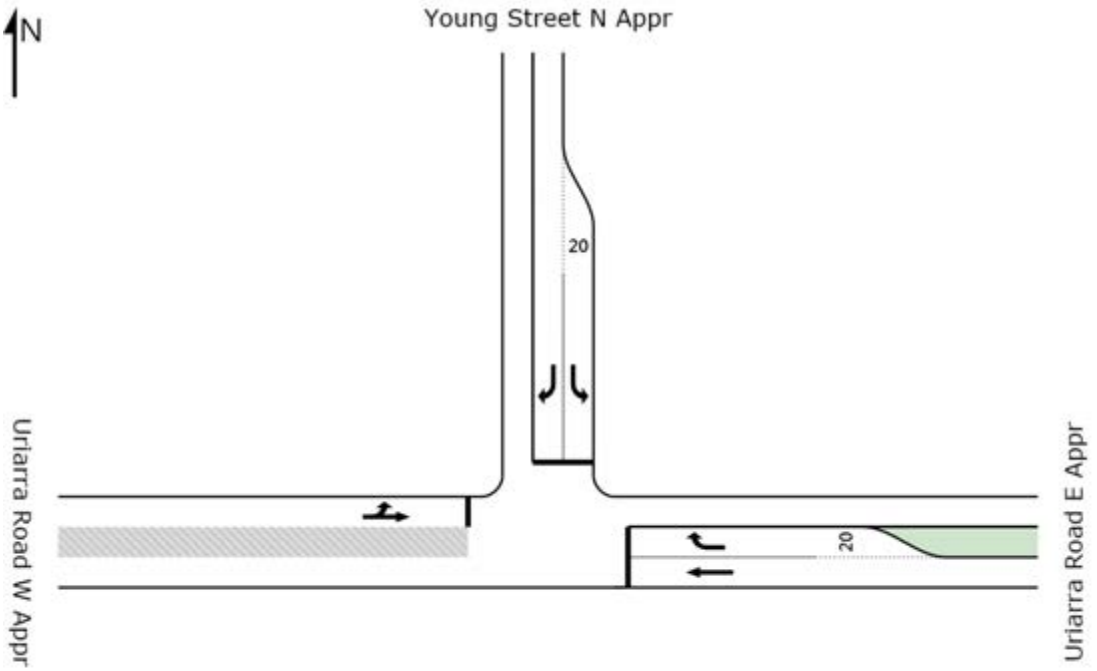
LANE SUMMARY

Site: Uriarra Road / Young Street 2031 Post Dev PM - Roundabout

JS10760
Uriarra Road / Young Street
Future Weekday PM - Roundabout
Roundabout

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Uriarra Road E Appr																
Lane 1	0	602	10	612	3.3	1473	0.416	100	6.3	LOS A	4.1	29.6	500	–	0.0	0.0
Approach	0	602	10	612	3.3		0.416		6.3	LOS A	4.1	29.6				
North: Young Street N Appr																
Lane 1	15	0	38	53	0.9	225	0.236	100	37.0	LOS C	1.7	12.2	500	–	0.0	0.0
Approach	15	0	38	53	0.9		0.236		37.0	LOS C	1.7	12.2				
West: Uriarra Road W Appr																
Lane 1	93	1418	0	1511	2.3	1671	0.905	100	6.3	LOS A	39.2	279.9	500	–	0.0	0.0
Approach	93	1418	0	1511	2.3		0.905		6.3	LOS A	39.2	279.9				
Intersection				2177	2.5		0.905		7.1	LOS A	39.2	279.9				



LANE SUMMARY

Site: Uriarra Road / Young Street 2031 Post Dev AM - Signals

JS10760
Uriarra Road / Young Street
2031 Post Dev Signals
Signals - Fixed Time Cycle Time = 110 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Uriarra Road E Appr																
Lane 1	0	1368	0	1368	2.9	1600	0.855	100	1.9	LOS A	19.1	137.4	500	–	0.0	0.0
Lane 2	0	0	8	8	0.0	277[1]	0.027	100	10.4	LOS A	0.1	0.6	20	Turn Bay	0.0	0.0
Approach	0	1368	8	1375	2.9		0.855		2.0	LOS A	19.1	137.4				
North: Young Street N Appr																
Lane 1	20	0	0	20	3.8	80[1]	0.256	100	64.3	LOS E	1.1	8.1	20	Turn Bay	0.0	0.0
Lane 2	0	0	87	87	0.0	101	0.860	100	72.9	LOS F	5.3	37.2	500	–	0.0	0.0
Approach	20	0	87	108	0.7		0.860		71.3	LOS F	5.3	37.2				
West: Uriarra Road W Appr																
Lane 1	38	442	0	480	7.7	1547	0.310	100	2.7	LOS A	5.6	41.4	500	–	0.0	0.0
Approach	38	442	0	480	7.7		0.310		2.7	LOS A	5.6	41.4				
Intersection				1962	4.0		0.860		5.9	LOS A	19.1	137.4				

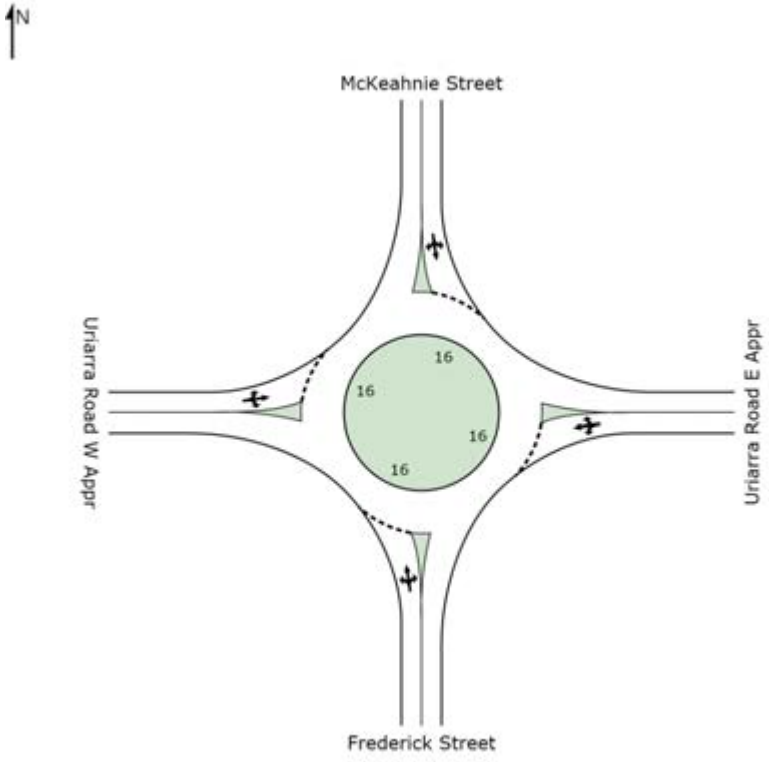
LANE SUMMARY

Site: Uriarra Road / Young Street 2031 Post Dev PM - Signals

JS10760
Uriarra Road / Young Street
Future Weekday PM - Signals
Signals - Fixed Time Cycle Time = 130 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Uriarra Road E Appr																
Lane 1	0	602	0	602	3.3	1645	0.366	100	1.9	LOS A	7.5	54.0	500	–	0.0	0.0
Lane 2	0	0	10	10	0.0	76	0.135	100	41.9	LOS C	0.5	3.4	20	Turn Bay	0.0	0.0
Approach	0	602	10	612	3.3		0.366		2.6	LOS A	7.5	54.0				
North: Young Street N Appr																
Lane 1	15	0	0	15	0.0	25[1]	0.610	100	76.4	LOS F	1.0	7.0	7	Turn Bay	0.0	5.2
Lane 2	0	0	38	38	1.3	85	0.444	100	77.2	LOS F	2.5	17.7	500	–	0.0	0.0
Approach	15	0	38	53	0.9		0.610		77.0	LOS F	2.5	17.7				
West: Uriarra Road W Appr																
Lane 1	93	1418	0	1511	2.3	1650	0.916	100	9.0	LOS A	64.6	461.5	500	–	0.0	0.0
Approach	93	1418	0	1511	2.3		0.916		9.0	LOS A	64.6	461.5				
Intersection				2177	2.5		0.916		8.9	LOS A	64.6	461.5				



LANE SUMMARY

Site: Uriarra Road / Frederick Street / McKeahnie Street 2031 Post Dev AM - Roundabout

JS10760
Uriarra Road / Frederick Street / McKeahnie Street
2031 Post Dev AM Roundabout
Roundabout

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Frederick Street																
Lane 1	86	2	16	104	1.2	264	0.396	100	29.0	LOS C	3.1	22.1	500	–	0.0	0.0
Approach	86	2	16	104	1.2		0.396		29.0	LOS C	3.1	22.1				
East: Uriarra Road E Appr																
Lane 1	29	1223	2	1254	3.3	1500	0.836	100	7.0	LOS A	19.3	138.9	500	–	0.0	0.0
Approach	29	1223	2	1254	3.3		0.836		7.0	LOS A	19.3	138.9				
North: McKeahnie Street																
Lane 1	10	1	46	57	0.0	828	0.069	100	12.4	LOS A	0.4	2.7	500	–	0.0	0.0
Approach	10	1	46	57	0.0		0.069		12.4	LOS A	0.4	2.7				
West: Uriarra Road W Appr																
Lane 1	8	457	1	466	8.1	1490	0.313	100	6.2	LOS A	2.7	20.2	500	–	0.0	0.0
Approach	8	457	1	466	8.1		0.313		6.2	LOS A	2.7	20.2				
Intersection				1881	4.3		0.836		8.2	LOS A	19.3	138.9				

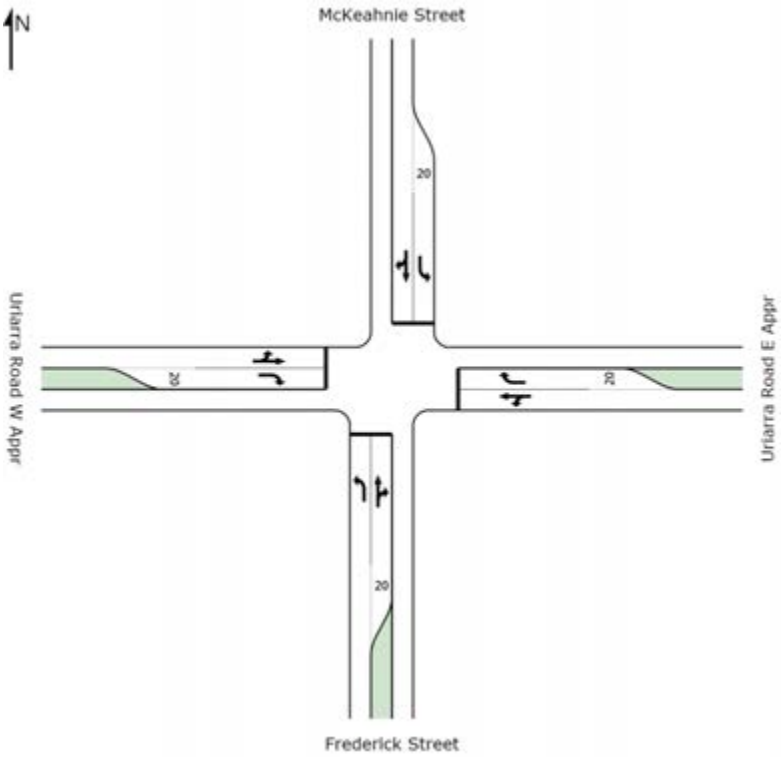
LANE SUMMARY

Site: Uriarra Road / Frederick Street / McKeahnie Street 2031 Post Dev PM - Roundabout

JS10760
Uriarra Road / Frederick Street / McKeahnie Street
2031 Post Dev PM Roundabout
Roundabout

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Frederick Street																
Lane 1	18	2	12	33	0.0	751	0.043	100	11.2	LOS A	0.2	1.7	500	–	0.0	0.0
Approach	18	2	12	33	0.0		0.043		11.2	LOS A	0.2	1.7				
East: Uriarra Road E Appr																
Lane 1	38	580	1	618	3.4	1505	0.411	100	6.2	LOS A	3.5	25.5	500	–	0.0	0.0
Approach	38	580	1	618	3.4		0.411		6.2	LOS A	3.5	25.5				
North: McKeahnie Street																
Lane 1	10	2	10	22	0.0	222	0.101	100	34.3	LOS C	0.7	5.1	500	–	0.0	0.0
Approach	10	2	10	22	0.0		0.101		34.3	LOS C	0.7	5.1				
West: Uriarra Road W Appr																
Lane 1	27	1383	20	1430	2.4	1642	0.871	100	6.4	LOS A	30.0	213.9	500	–	0.0	0.0
Approach	27	1383	20	1430	2.4		0.871		6.4	LOS A	30.0	213.9				
Intersection				2103	2.6		0.871		6.7	LOS A	30.0	213.9				



LANE SUMMARY

Site: Uriarra Road / Frederick Street / McKeahnie Street 2031 Post Dev AM - Signals

JS10760
Uriarra Road / Frederick Street / McKeahnie Street
2031 Post Dev AM Signals
Signals - Fixed Time Cycle Time = 100 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Frederick Street																
Lane 1	86	0	0	86	1.5	110	0.780	100	63.8	LOS E	4.6	32.9	500	–	0.0	0.0
Lane 2	0	2	16	18	0.0	91[1]	0.201	100	57.5	LOS E	0.9	6.3	20	Turn Bay	0.0	0.0
Approach	86	2	16	104	1.2		0.780		62.7	LOS E	4.6	32.9				
East: Uriarra Road E Appr																
Lane 1	29	1223	0	1252	3.3	1563	0.801	100	1.8	LOS A	13.0	93.4	500	–	0.0	0.0
Lane 2	0	0	2	2	0.0	280[1]	0.008	100	10.6	LOS A	0.0	0.2	20	Turn Bay	0.0	0.0
Approach	29	1223	2	1254	3.3		0.801		1.9	LOS A	13.0	93.4				
North: McKeahnie Street																
Lane 1	10	0	0	10	0.0	92[1]	0.106	100	57.6	LOS E	0.5	3.3	20	Turn Bay	0.0	0.0
Lane 2	0	1	46	47	0.0	79	0.598	100	63.5	LOS E	2.5	17.6	500	–	0.0	0.0
Approach	10	1	46	57	0.0		0.598		62.5	LOS E	2.5	17.6				
West: Uriarra Road W Appr																
Lane 1	8	457	0	465	8.1	1518	0.306	100	2.4	LOS A	5.3	39.9	500	–	0.0	0.0
Lane 2	0	0	1	1	0.0	86	0.012	100	23.3	LOS B	0.0	0.2	20	Turn Bay	0.0	0.0
Approach	8	457	1	466	8.1		0.306		2.4	LOS A	5.3	39.9				
Intersection				1881	4.3		0.801		7.2	LOS A	13.0	93.4				

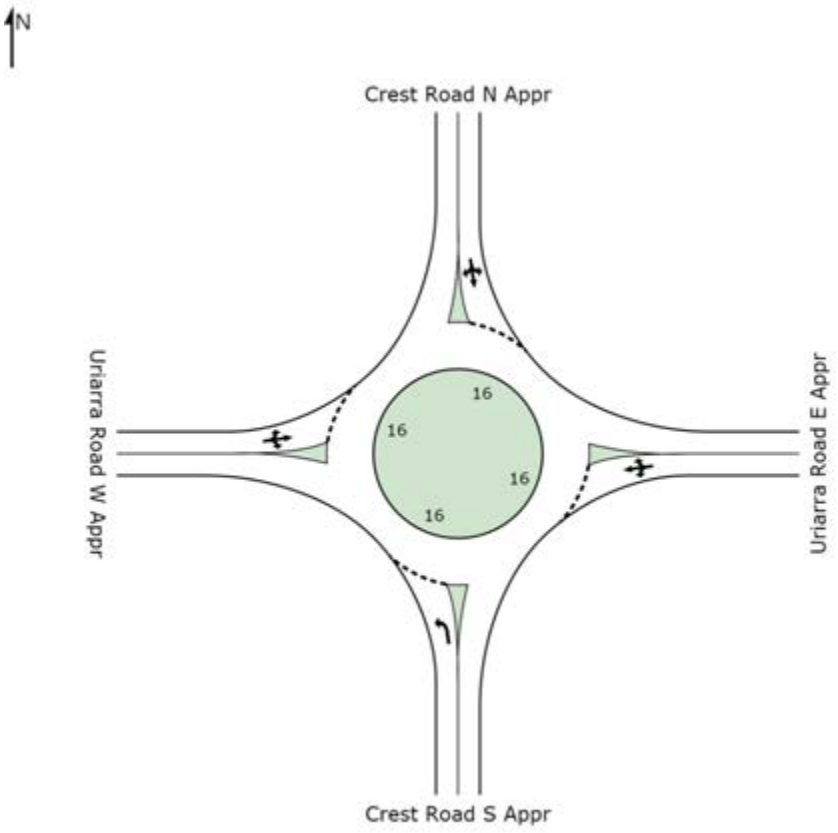
LANE SUMMARY

Site: Uriarra Road / Frederick Street / McKeahnie Street 2031 Post Dev PM - Signals

JS10760
Uriarra Road / Frederick Street / McKeahnie Street
2031 Post Dev PM Signals
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Frederick Street																
Lane 1	18	0	0	18	0.0	93	0.198	100	69.7	LOS E	1.1	7.7	500	–	0.0	0.0
Lane 2	0	2	12	14	0.0	76[1]	0.189	100	68.6	LOS E	0.8	5.9	20	Turn Bay	0.0	0.0
Approach	18	2	12	33	0.0		0.198		69.2	LOS E	1.1	7.7				
East: Uriarra Road E Appr																
Lane 1	38	580	0	617	3.4	1617	0.382	100	2.6	LOS A	7.8	56.4	500	–	0.0	0.0
Lane 2	0	0	1	1	0.0	67	0.015	100	29.5	LOS C	0.0	0.3	20	Turn Bay	0.0	0.0
Approach	38	580	1	618	3.4		0.382		2.6	LOS A	7.8	56.4				
North: McKeahnie Street																
Lane 1	10	0	0	10	0.0	76[1]	0.134	100	69.0	LOS E	0.6	4.2	20	Turn Bay	0.0	0.0
Lane 2	0	2	10	12	0.0	87	0.141	100	68.4	LOS E	0.7	5.1	500	–	0.0	0.0
Approach	10	2	10	22	0.0		0.141		68.7	LOS E	0.7	5.1				
West: Uriarra Road W Appr																
Lane 1	27	1383	0	1409	2.4	1631	0.864	100	2.3	LOS A	23.0	164.2	500	–	0.0	0.0
Lane 2	0	0	20	20	0.0	246[1]	0.083	100	10.7	LOS A	0.3	1.8	20	Turn Bay	0.0	0.0
Approach	27	1383	20	1430	2.4		0.864		2.4	LOS A	23.0	164.2				
Intersection				2103	2.6		0.864		4.2	LOS A	23.0	164.2				



LANE SUMMARY

Site: Uriarra Road / Crest Road 2031 Post Dev AM - Roundabout

JS10760
Uriarra Road / Crest Road - Roundabout
2031 Post Dev AM
Roundabout

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Crest Road S Appr																
Lane 1	87	0	0	87	0.0	309	0.283	100	20.1	LOS B	2.1	14.5	500	–	0.0	0.0
Approach	87	0	0	87	0.0		0.283		20.1	LOS B	2.1	14.5				
East: Uriarra Road E Appr																
Lane 1	24	1083	11	1118	3.3	1390	0.804	100	7.5	LOS A	14.0	100.9	500	–	0.0	0.0
Approach	24	1083	11	1118	3.3		0.804		7.5	LOS A	14.0	100.9				
North: Crest Road N Appr																
Lane 1	20	1	67	88	0.9	830	0.106	100	12.4	LOS A	0.6	4.3	500	–	0.0	0.0
Approach	20	1	67	88	0.9		0.106		12.4	LOS A	0.6	4.3				
West: Uriarra Road W Appr																
Lane 1	9	466	16	490	7.3	1571	0.312	100	6.3	LOS A	2.6	19.5	500	–	0.0	0.0
Approach	9	466	16	490	7.3		0.312		6.3	LOS A	2.6	19.5				
Intersection				1784	4.1		0.804		8.0	LOS A	14.0	100.9				

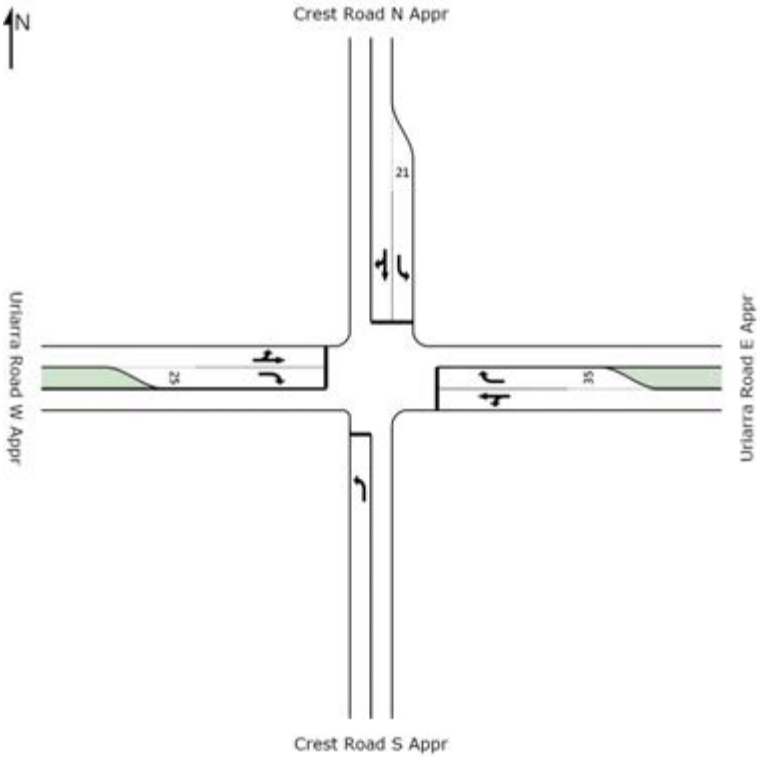
LANE SUMMARY

Site: Uriarra Road / Crest Road 2031 Post Dev PM - Roundabout

JS10760
Uriarra Road / Crest Road - Roundabout
2031 Post Dev PM
Roundabout

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Crest Road S Appr																
Lane 1	38	0	0	38	0.0	702	0.053	100	10.1	LOS A	0.3	2.2	500	–	0.0	0.0
Approach	38	0	0	38	0.0		0.053		10.1	LOS A	0.3	2.2				
East: Uriarra Road E Appr																
Lane 1	32	571	36	640	3.1	1367	0.468	100	6.8	LOS A	4.4	31.4	500	–	0.0	0.0
Approach	32	571	36	640	3.1		0.468		6.8	LOS A	4.4	31.4				
North: Crest Road N Appr																
Lane 1	25	1	24	50	0.0	169	0.296	100	34.3	LOS C	2.2	15.7	500	–	0.0	0.0
Approach	25	1	24	50	0.0		0.296		34.3	LOS C	2.2	15.7				
West: Uriarra Road W Appr																
Lane 1	31	1352	49	1432	2.5	1556	0.920	100	7.4	LOS A	36.7	262.1	500	–	0.0	0.0
Approach	31	1352	49	1432	2.5		0.920		7.4	LOS A	36.7	262.1				
Intersection				2159	2.6		0.920		7.9	LOS A	36.7	262.1				



LANE SUMMARY

Site: Uriarra Road / Crest Road 2031 Post Dev AM - Signals

JS10760
Uriarra Road / Crest Road - Signals
2031 Post Dev AM
Signals - Fixed Time Cycle Time = 70 seconds (Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Crest Road S Appr																
Lane 1	87	0	0	87	0.0	159	0.548	100	43.2	LOS D	3.1	21.8	500	–	0.0	0.0
Approach	87	0	0	87	0.0		0.548		43.2	LOS D	3.1	21.8				
East: Uriarra Road E Appr																
Lane 1	24	1083	0	1107	3.3	1416	0.782	100	1.8	LOS A	7.9	56.7	500	–	0.0	0.0
Lane 2	0	0	11	11	0.0	398[1]	0.027	100	12.1	LOS A	0.1	0.9	35	Turn Bay	0.0	0.0
Approach	24	1083	11	1118	3.3		0.782		1.9	LOS A	7.9	56.7				
North: Crest Road N Appr																
Lane 1	20	0	0	20	0.0	137[1]	0.148	100	41.0	LOS C	0.7	4.8	21	Turn Bay	0.0	0.0
Lane 2	0	1	67	68	1.2	113	0.602	100	46.0	LOS D	2.5	17.9	500	–	0.0	0.0
Approach	20	1	67	88	0.9		0.602		44.9	LOS D	2.5	17.9				
West: Uriarra Road W Appr																
Lane 1	9	466	0	474	7.6	1379	0.344	100	3.5	LOS A	5.6	41.4	500	–	0.0	0.0
Lane 2	0	0	16	16	0.0	133	0.120	100	23.4	LOS B	0.4	2.6	25	Turn Bay	0.0	0.0
Approach	9	466	16	490	7.3		0.344		4.1	LOS A	5.6	41.4				
Intersection				1784	4.1		0.782		6.6	LOS A	7.9	56.7				

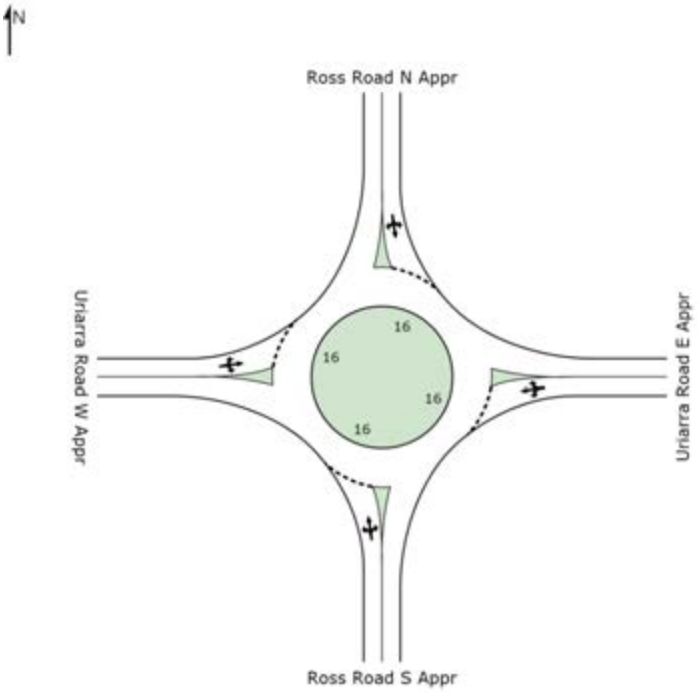
LANE SUMMARY

Site: Uriarra Road / Crest Road 2031 Post Dev PM - Signals

JS10760
Uriarra Road / Crest Road - Signals
2031 Post Dev PM
Signals - Fixed Time Cycle Time = 100 seconds (Practical Cycle Time)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Crest Road S Appr																
Lane 1	38	0	0	38	0.0	111	0.337	100	59.2	LOS E	1.9	13.2	500	–	0.0	0.0
Approach	38	0	0	38	0.0		0.337		59.2	LOS E	1.9	13.2				
East: Uriarra Road E Appr																
Lane 1	32	571	0	603	3.3	1561	0.386	100	2.9	LOS A	7.6	54.7	500	–	0.0	0.0
Lane 2	0	0	36	36	0.0	91	0.401	100	36.5	LOS C	1.5	10.4	35	Turn Bay	0.0	0.0
Approach	32	571	36	640	3.1		0.401		4.8	LOS A	7.6	54.7				
North: Crest Road N Appr																
Lane 1	25	0	0	25	0.0	95[1]	0.263	100	58.6	LOS E	1.2	8.7	21	Turn Bay	0.0	0.0
Lane 2	0	1	24	25	0.0	94	0.267	100	59.3	LOS E	1.3	8.8	500	–	0.0	0.0
Approach	25	1	24	50	0.0		0.267		58.9	LOS E	1.3	8.8				
West: Uriarra Road W Appr																
Lane 1	31	1352	0	1383	2.5	1572	0.880	100	4.9	LOS A	24.1	172.2	500	–	0.0	0.0
Lane 2	0	0	49	49	3.8	281[1]	0.175	100	11.8	LOS A	0.7	4.8	25	Turn Bay	0.0	0.0
Approach	31	1352	49	1432	2.5		0.880		5.2	LOS A	24.1	172.2				
Intersection				2159	2.6		0.880		7.2	LOS A	24.1	172.2				



LANE SUMMARY

Site: Uriarra Road / Ross Road 2031 Post Dev AM - Roundabout

JS10760
Uriarra Road / Ross Road - Roundabout
2031 Post Dev AM
Roundabout

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Ross Road S Appr																
Lane 1	99	65	14	178	1.1	451	0.394	100	16.5	LOS B	3.0	21.1	500	–	0.0	0.0
Approach	99	65	14	178	1.1		0.394		16.5	LOS B	3.0	21.1				
East: Uriarra Road E Appr																
Lane 1	37	941	10	987	3.4	1407	0.702	100	7.0	LOS A	9.6	69.1	500	–	0.0	0.0
Approach	37	941	10	987	3.4		0.702		7.0	LOS A	9.6	69.1				
North: Ross Road N Appr																
Lane 1	37	36	13	85	0.9	753	0.113	100	9.5	LOS A	0.7	4.8	500	–	0.0	0.0
Approach	37	36	13	85	0.9		0.113		9.5	LOS A	0.7	4.8				
West: Uriarra Road W Appr																
Lane 1	17	503	25	546	6.7	1280	0.426	100	7.0	LOS A	3.9	28.9	500	–	0.0	0.0
Approach	17	503	25	546	6.7		0.426		7.0	LOS A	3.9	28.9				
Intersection				1796	4.0		0.702		8.1	LOS A	9.6	69.1				

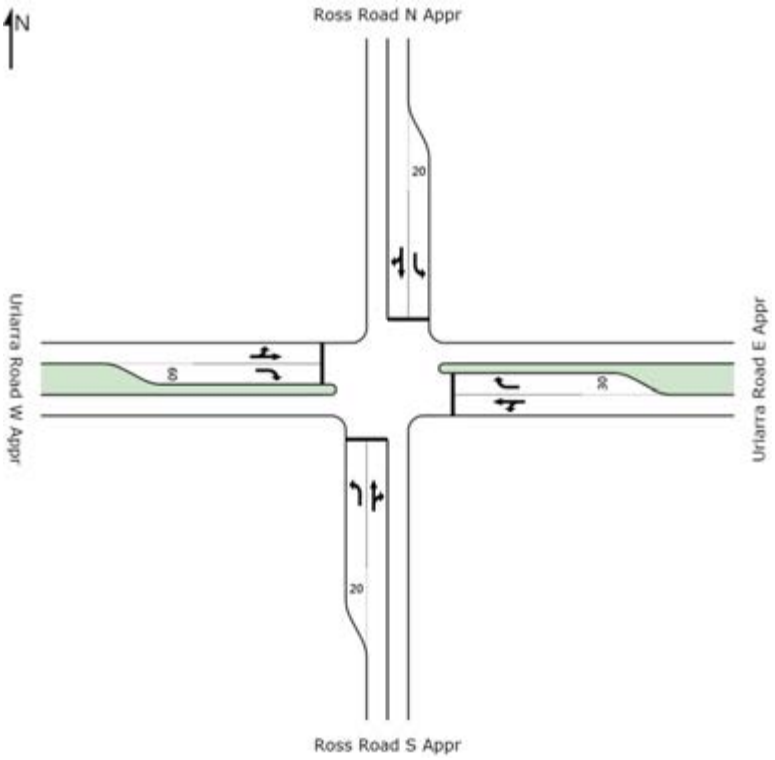
LANE SUMMARY

Site: Uriarra Road / Ross Road 2031 Post Dev PM - Roundabout

JS10760
Uriarra Road / Ross Road - Roundabout
2031 Post Dev PM
Roundabout

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Ross Road S Appr																
Lane 1	39	39	32	109	0.8	669	0.163	100	11.3	LOS A	1.0	7.4	500	–	0.0	0.0
Approach	39	39	32	109	0.8		0.163		11.3	LOS A	1.0	7.4				
East: Uriarra Road E Appr																
Lane 1	54	618	22	695	3.1	1284	0.541	100	7.2	LOS A	5.4	38.9	500	–	0.0	0.0
Approach	54	618	22	695	3.1		0.541		7.2	LOS A	5.4	38.9				
North: Ross Road N Appr																
Lane 1	26	39	8	72	0.4	170	0.427	100	38.1	LOS C	3.5	24.5	500	–	0.0	0.0
Approach	26	39	8	72	0.4		0.427		38.1	LOS C	3.5	24.5				
West: Uriarra Road W Appr																
Lane 1	34	1250	64	1348	2.3	1382	0.976	100	11.8	LOS A	41.1	293.3	500	–	0.0	0.0
Approach	34	1250	64	1348	2.3		0.976		11.8	LOS A	41.1	293.3				
Intersection				2224	2.4		0.976		11.2	LOS A	41.1	293.3				



LANE SUMMARY

Site: Uriarra Road / Ross Road 2031 Post Dev AM - Signals

JS10760
Uriarra Road / Ross Road - Signals
2031 Post Dev AM
Signals - Fixed Time Cycle Time = 60 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Ross Road S Appr																
Lane 1	99	0	0	99	1.1	148[1]	0.667	100	38.3	LOS C	3.1	21.7	20	Turn Bay	0.0	12.4
Lane 2	0	65	14	79	1.2	178	0.442	100	31.0	LOS C	2.4	16.7	500	–	0.0	0.0
Approach	99	65	14	178	1.1		0.667		35.0	LOS C	3.1	21.7				
East: Uriarra Road E Appr																
Lane 1	37	941	0	978	3.4	1333	0.734	100	2.0	LOS A	6.5	47.0	500	–	0.0	0.0
Lane 2	0	0	10	10	0.0	357[1]	0.027	100	12.8	LOS A	0.1	0.8	30	Turn Bay	0.0	0.0
Approach	37	941	10	987	3.4		0.734		2.1	LOS A	6.5	47.0				
North: Ross Road N Appr																
Lane 1	37	0	0	37	1.1	150[1]	0.243	100	35.8	LOS C	1.1	7.4	20	Turn Bay	0.0	0.0
Lane 2	0	36	13	49	0.8	157	0.311	100	31.4	LOS C	1.4	10.2	500	–	0.0	0.0
Approach	37	36	13	85	0.9		0.311		33.3	LOS C	1.4	10.2				
West: Uriarra Road W Appr																
Lane 1	17	503	0	520	7.0	1303	0.399	100	4.3	LOS A	6.3	47.0	500	–	0.0	0.0
Lane 2	0	0	25	25	0.0	175	0.144	100	21.0	LOS B	0.5	3.6	60	Turn Bay	0.0	0.0
Approach	17	503	25	546	6.7		0.399		5.1	LOS A	6.3	47.0				
Intersection				1796	4.0		0.734		7.7	LOS A	6.5	47.0				

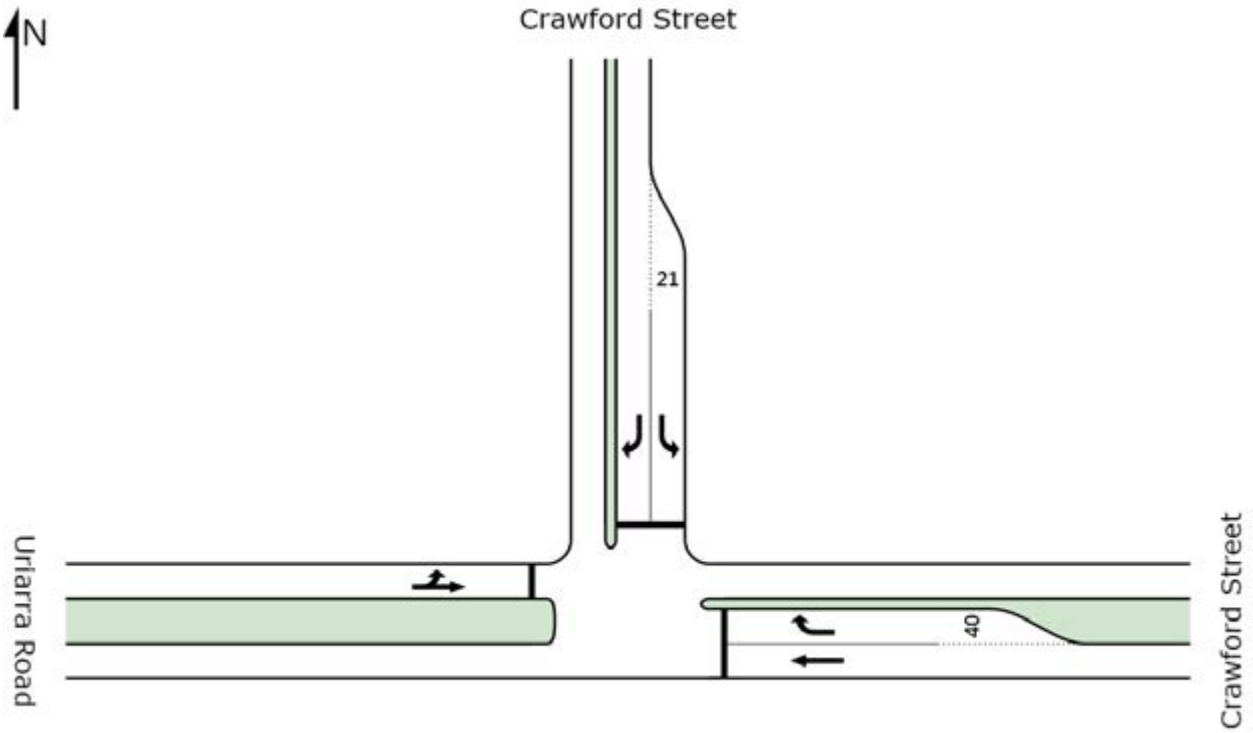
LANE SUMMARY

Site: Uriarra Road / Ross Road 2031 Post Dev PM - Signals

JS10760
Uriarra Road / Ross Road - Roundabout
2031 Post Dev PM
Signals - Fixed Time Cycle Time = 100 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Ross Road S Appr																
Lane 1	39	0	0	39	2.3	88[1]	0.439	100	59.4	LOS E	2.0	13.9	20	Turn Bay	0.0	0.0
Lane 2	0	39	32	70	0.0	95	0.743	100	59.8	LOS E	3.8	26.6	500	–	0.0	0.0
Approach	39	39	32	109	0.8		0.743		59.6	LOS E	3.8	26.6				
East: Uriarra Road E Appr																
Lane 1	54	618	0	672	3.2	1560	0.431	100	3.2	LOS A	9.0	64.4	500	–	0.0	0.0
Lane 2	0	0	22	22	0.0	89	0.253	100	27.4	LOS B	0.7	5.2	30	Turn Bay	0.0	0.0
Approach	54	618	22	695	3.1		0.431		4.0	LOS A	9.0	64.4				
North: Ross Road N Appr																
Lane 1	26	0	0	26	1.1	90[1]	0.284	100	58.7	LOS E	1.3	8.9	20	Turn Bay	0.0	0.0
Lane 2	0	39	8	47	0.0	105	0.447	100	54.1	LOS D	2.4	16.7	500	–	0.0	0.0
Approach	26	39	8	72	0.4		0.447		55.7	LOS D	2.4	16.7				
West: Uriarra Road W Appr																
Lane 1	34	1250	0	1284	2.2	1574	0.815	100	1.9	LOS A	14.2	101.2	500	–	0.0	0.0
Lane 2	0	0	64	64	3.3	412[1]	0.156	100	12.0	LOS A	0.9	6.8	60	Turn Bay	0.0	0.0
Approach	34	1250	64	1348	2.3		0.815		2.4	LOS A	14.2	101.2				
Intersection				2224	2.4		0.815		7.5	LOS A	14.2	101.2				



LANE SUMMARY

Site: Uriarra Road / Crawford Street 2031 Post Dev AM - Signals

JS10760
Uriarra Road / Crawford Street - Signals
2031 Post Dev AM
Signals - Fixed Time Cycle Time = 80 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Crawford Street																
Lane 1	0	811	0	811	4.2	1471	0.551	100	3.8	LOS A	12.3	89.1	500	–	0.0	0.0
Lane 2	0	0	119	119	1.7	377[1]	0.316	100	13.0	LOS A	1.8	12.8	40	Turn Bay	0.0	0.0
Approach	0	811	119	929	3.9		0.551		4.9	LOS A	12.3	89.1				
North: Crawford Street																
Lane 1	41	0	0	41	3.7	114[1]	0.359	100	47.8	LOS D	1.6	11.8	21	Turn Bay	0.0	0.0
Lane 2	0	0	76	76	1.0	138	0.548	100	49.1	LOS D	3.1	21.9	500	–	0.0	0.0
Approach	41	0	76	117	2.0		0.548		48.6	LOS D	3.1	21.9				
West: Uriarra Road																
Lane 1	55	529	0	584	6.6	1443	0.405	100	3.8	LOS A	7.4	54.6	500	–	0.0	0.0
Approach	55	529	0	584	6.6		0.405		3.8	LOS A	7.4	54.6				
Intersection				1631	4.7		0.551		7.7	LOS A	12.3	89.1				

LANE SUMMARY

Site: Uriarra Road / Crawford Street 2031 Post Dev PM - Signals

JS10760
Uriarra Road / Crawford Street
Roundabout Weekday PM
Signals - Fixed Time Cycle Time = 80 seconds (Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Crawford Street																
Lane 1	0	632	0	632	3.3	1480	0.427	100	3.2	LOS A	8.2	59.0	500	–	0.0	0.0
Lane 2	0	0	64	64	1.5	122	0.523	100	30.1	LOS C	2.1	15.2	40	Turn Bay	0.0	0.0
Approach	0	632	64	696	3.1		0.523		5.7	LOS A	8.2	59.0				
North: Crawford Street																
Lane 1	71	0	0	71	1.2	116[1]	0.608	100	49.2	LOS D	2.9	20.5	21	Turn Bay	0.0	3.0
Lane 2	0	0	107	107	0.7	139	0.773	100	52.1	LOS D	4.6	32.7	500	–	0.0	0.0
Approach	71	0	107	178	0.9		0.773		51.0	LOS D	4.6	32.7				
West: Uriarra Road																
Lane 1	48	1159	0	1207	2.2	1486	0.812	100	2.3	LOS A	11.3	80.8	500	–	0.0	0.0
Approach	48	1159	0	1207	2.2		0.812		2.3	LOS A	11.3	80.8				
Intersection				2081	2.4		0.812		7.6	LOS A	11.3	80.8				

LANE SUMMARY

Site: Uriarra Road / Crawford Street 2031 Post Dev AM - No RT Out

JS10760
Uriarra Road / Crawford Street
2031 Post Dev AM
No RT Out
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Crawford Street																
Lane 1	0	811	0	811	4.2	1898	0.427	100	0.0	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	119	119	1.7	717	0.166	100	11.3	LOS A	0.6	4.5	40	Turn Bay	0.0	0.0
Approach	0	811	119	929	3.9		0.427		1.5	NA	0.6	4.5				
North: Crawford Street																
Lane 1	41	0	0	41	3.7	584	0.070	100	11.3	LOS A	0.2	1.7	500	–	0.0	0.0
Approach	41	0	0	41	3.7		0.070		11.3	LOS A	0.2	1.7				
West: Uriarra Road																
Lane 1	55	529	0	584	6.6	1861	0.314	100	0.7	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	55	529	0	584	6.6		0.314		0.7	NA	0.0	0.0				
Intersection				1555	4.9		0.427		1.4	NA	0.6	4.5				

LANE SUMMARY

Site: Uriarra Road / Crawford Street 2031 Post Dev PM - No RT Out

JS10760
Uriarra Road / Crawford Street
2031 Post Dev PM
No RT Out
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
East: Crawford Street																
Lane 1	0	632	0	632	3.3	1909	0.331	100	0.0	LOS A	0.0	0.0	500	–	0.0	0.0
Lane 2	0	0	64	64	1.5	179	0.355	100	31.6	LOS C	1.2	8.4	40	Turn Bay	0.0	0.0
Approach	0	632	64	696	3.1		0.355		2.9	NA	1.2	8.4				
North: Crawford Street																
Lane 1	71	0	0	71	1.2	129	0.549	100	46.2	LOS D	1.9	13.2	500	–	0.0	0.0
Approach	71	0	0	71	1.2		0.549		46.2	LOS D	1.9	13.2				
West: Uriarra Road																
Lane 1	48	1159	0	1207	2.2	1918	0.629	100	0.3	LOS A	0.0	0.0	500	–	0.0	0.0
Approach	48	1159	0	1207	2.2		0.629		0.3	NA	0.0	0.0				
Intersection				1974	2.5		0.629		2.9	NA	1.9	13.2				

LANE SUMMARY

Site: Uriarra Road / Ross Road 2031 Post Dev AM - Signals - Additional from Crawford

JS10760
Uriarra Road / Ross Road - Signals
2031 Post Dev AM
Additional from Crawford Street Signals - Fixed Time Cycle Time = 60 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Ross Road S Appr																
Lane 1	99	65	0	164	0.6	180[1]	0.911	100	30.7[8]	LOS C[8]	4.6[8]	32.6[8]	20	Turn Bay	0.0	50.0
Lane 2	0	0	14	14	7.1	323	0.042	100	28.0	LOS B	0.3	2.4	500	–	0.0	0.0
Approach	99	65	14	178	1.1		0.911		30.5	LOS C	4.6	32.6				
East: Uriarra Road E Appr																
Lane 1	37	941	0	978	3.4	1079	0.906	100	20.0	LOS B	30.7	221.0	500	–	0.0	0.0
Lane 2	0	0	10	10	0.0	280[1]	0.035	100	19.5	LOS B	0.2	1.2	30	Turn Bay	0.0	0.0
Approach	37	941	10	987	3.4		0.906		20.0	LOS B	30.7	221.0				
North: Ross Road N Appr																
Lane 1	37	36	0	72	1.1	181[1]	0.400	100	23.9	LOS B	1.7	12.3	20	Turn Bay	0.0	0.0
Lane 2	0	0	90	90	0.0	262	0.344	100	32.5	LOS C	2.5	17.4	500	–	0.0	0.0
Approach	37	36	90	163	0.5		0.400		28.7	LOS C	2.5	17.4				
West: Uriarra Road W Appr																
Lane 1	17	503	0	520	7.0	1055	0.493	100	8.7	LOS A	9.2	68.5	500	–	0.0	0.0
Lane 2	0	0	25	25	0.0	140	0.181	100	35.7	LOS C	0.7	5.1	60	Turn Bay	0.0	0.0
Approach	17	503	25	546	6.7		0.493		10.0	LOS A	9.2	68.5				
Intersection				1874	3.9		0.911		18.8	LOS B	30.7	221.0				

draft

LANE SUMMARY

Site: Uriarra Road / Ross Road 2031 Post Dev PM - Signals - Additional from Crawford

JS10760
Uriarra Road / Ross Road - Roundabout
2031 Post Dev PM
Additional from Crawford Signals - Fixed Time Cycle Time = 100 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows				HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Length	SL Type	Cap. Adj.	Prob. Block.
	L	T	R	Total							Vehicles	Distance				
	veh/h	veh/h	veh/h	veh/h	%	veh/h	v/c	%	sec		veh	m	m		%	%
South: Ross Road S Appr																
Lane 1	39	39	0	78	1.2	97[1]	0.801	100	55.7	LOS D	4.0	27.9	20	Turn Bay	0.0	35.5
Lane 2	0	0	32	32	0.0	143	0.221	100	56.1	LOS D	1.5	10.7	500	–	0.0	0.0
Approach	39	39	32	109	0.8		0.801		55.8	LOS D	4.0	27.9				
East: Uriarra Road E Appr																
Lane 1	54	618	0	672	3.2	1465	0.459	100	4.9	LOS A	11.5	82.4	500	–	0.0	0.0
Lane 2	0	0	22	22	0.0	85	0.263	100	38.7	LOS C	0.9	6.4	30	Turn Bay	0.0	0.0
Approach	54	618	22	695	3.1		0.459		6.0	LOS A	11.5	82.4				
North: Ross Road N Appr																
Lane 1	26	39	0	64	0.4	98[1]	0.658	100	50.2	LOS D	3.1	21.6	20	Turn Bay	0.0	12.1
Lane 2	0	0	116	116	0.0	133	0.874	100	67.3	LOS E	6.6	46.0	500	–	0.0	0.0
Approach	26	39	116	181	0.2		0.874		61.2	LOS E	6.6	46.0				
West: Uriarra Road W Appr																
Lane 1	34	1250	0	1284	2.2	1478	0.868	100	4.7	LOS A	20.9	149.0	500	–	0.0	0.0
Lane 2	0	0	64	64	3.3	371[1]	0.173	100	14.9	LOS B	1.2	8.8	60	Turn Bay	0.0	0.0
Approach	34	1250	64	1348	2.3		0.868		5.2	LOS A	20.9	149.0				
Intersection				2333	2.3		0.874		12.2	LOS A	20.9	149.0				

draft

Appendix I

Intersection Concept Design

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION
DATE OF ISSUE:.....

GTAconsultants
www.gta.com.au

INTERSECTION OF URIARRA RD / CRAWFORD ST
SIGNALISED INTERSECTION TREATMENT
CONCEPT LAYOUT PLAN

03 NOVEMBER '11
SCALE 1:500@A3
JS10760-01-01-P1

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION
DATE OF ISSUE:.....

GTAconsultants
www.gta.com.au

INTERSECTION OF URIARRA RD / CRAWFORD ST
LEFT TURN ONLY TREATMENT
CONCEPT LAYOUT PLAN

03 NOVEMBER '11
SCALE 1:500@A3
JS10760-01-02-P1

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION
DATE OF ISSUE:.....

GTAconsultants
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INTERSECTION OF URIARRA RD / ROSS RD
SIGNALISED INTERSECTION TREATMENT
CONCEPT LAYOUT PLAN

03 NOVEMBER '11
SCALE 1:500@A3
JS10760-01-03-P1

URIARRA

ROAD

ROAD

AVENUE

BLACKALL

ROSS

N

PRELIMINARY PLAN

FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION

DATE OF ISSUE:.....

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INTERSECTION OF URIARRA RD / ROSS RD
ROUNDABOUT TREATMENT
CONCEPT LAYOUT PLAN

03 NOVEMBER '11
SCALE 1:500@A3
JS10760-01-04-P1

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION
DATE OF ISSUE:.....

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INTERSECTION OF URIARRA RD / CREST RD
SIGNALISED INTERSECTION TREATMENT
CONCEPT LAYOUT PLAN

03 NOVEMBER '11
SCALE 1:500@A3
JS10760-01-05-P1

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION
DATE OF ISSUE:.....

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INTERSECTION OF URIARRA RD / CREST RD
ROUNDABOUT TREATMENT
CONCEPT LAYOUT PLAN

03 NOVEMBER '11
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JS10760-01-06-P1

PRELIMINARY PLAN

FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION

DATE OF ISSUE:.....

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INTERSCTION OF URIARRA RD / McKEAHNIE ST
SIGNALISED INTERSECTION TREATMENT
CONCEPT LAYOUT PLAN

03 NOVEMBER '11
SCALE 1:500@A3
JS10760-01-07-P1

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INTERSECTION OF URIARRA RD / McKEAHNIE ST
ROUNDABOUT TREATMENT
CONCEPT LAYOUT PLAN

03 NOVEMBER '11
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JS10760-01-08-P1

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