DEPARTMENT OF PLANNING & INFRASTRUCTURE

JULY 2011

REVIEW OF PROPOSED MOSQUE
158A & 164 CROUDACE ROAD
ELERMORE VALE

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2011/101

TABLE OF CONTENTS

1.0 INTRODUCTION

M^CLaren Traffic Engineering was commissioned in 2011 by the Department of Planning and Infrastructure to provide traffic advice and peer review for a proposed mosque at 158a Croudace Road, Elermore Vale, in accordance with the following scope of works:

- *Review existing traffic assessment and addendum / supplementary report prepared by TPK & Associates for the applicant (dated March 2010 and July 2010) and Newcastle City Council's assessment of the traffic issue.*
- *Review peer review report (prepared on behalf of the Panel) by Mark Waugh of Better Transport Futures (dated April 2011) and review comments by the Joint Regional Planning Panel as outlined in Minutes from Panel Meeting on 5 May 2011.*
- *Undertake appropriate level of research of similar places of worship (in terms of operation, accessibility and parking availability) to ascertain the appropriate car occupancy rate to be applied to the proposed development.*
- *Provide advice on the traffic and parking implications for the area as a result of the expected car occupancy rate. Such findings are to consider whether traffic and parking impacts are acceptable or able to be ameliorated by works or conditions.*
- *Prepare a summary report to the Panel Secretariat.*
- *Meet with Hunter and Central Coast Region Joint Regional Planning Panel and a public panel meeting in August 2011 to respond to questions.*

The development details are as follows:

- Construction of new mosque at 158a Croudace Road, Elermore Vale
- Various daily prayer services with low attendance rates
- Up to 400 attendees during weekly Friday prayer service from 1-2pm
- Occasional peak events for up to 450 attendees
- On-site parking provision of 162 spaces.

1.1 Site Location

The existing site consists of a large property with access via Croudace Road, as shown in the aerial photograph below.

Site Location

Opposite the site is Elermore Shopping Centre, with playing fields behind the shopping centre. The site is surrounded by residential dwelling homes.

Croudace Road has the following characteristics adjacent to the site:

- 10.8m wide carriageway between barrier kerbs.
- A posted speed limit of 60km/h.
- Two lanes for traffic flow (one lane in each direction).
- Unrestricted kerbside parking is permitted on both sides of the road.
- Double white barrier lanes along the centreline of the road.

2.0 PARKING DEMAND CHARARTERISTICS AT EXISTING MOSQUES

One of the key concerns raised during the assessment process relates to the peak parking demand (and car occupancy rates) attributed to operational mosques. It is clear from the information submitted and from the review of other Mosques that peak parking demand occurs on a regular basis on a Friday generally at a time in the period between noon to 2pm. Higher peak parking demand can also occur during special prayer days. TPK indicates a maximum peak on special days (identified as twice a year) of 450 attendees.

Numerous surveys have been undertaken at existing mosques in order to determine the appropriate car occupancy rate to be applied to the proposed development. Surveys were conducted under our direction at three mosques in the Sydney Metropolitan area and at the Wallsend site in the Hunter region, referred to in both the *TPK* and *Better Transport Futures*.

In order to undertake surveys of similar mosques it is instructive and important that they be selected with similar public transport accessibility. The distances to train stations for each of the selected mosques are as follows:

- Garema Court, Kingsgrove … 2.6km to Kingsgrove Rail Station.
- 264 Wilson Rd, Green Valley … 7.1 km to Liverpool Rail Station.
- 30 Bourke Street, Smithfield … 4.2m to Fairfield Rail Station.
- Bibbys Place, Bonnyrigg … 5.6km to Cabramatta Rail Station.
- Metcalfe Street, Wallsend … 5.1km to Warabrook Rail Station.

The subject site at Elermore Vale is located some 4.2km from Cardiff Rail Station.

Reference is also made to surveys conducted by *Curtis Traffic Surveys* for a mosque in Kingsgrove. A review of the various surveys shows that similar existing mosques have an average of **1.5** passengers per vehicle. This confirms studies undertaken by *Better Transport Futures*.

The following table summarises the results of the surveys. More detailed survey data is provided in **Annexure A**.

TABLE 1: CAR OCCUPANCY OF EXISTING MOSQUES

Location of Mosque	Surveyor	Date of Survey	Arrival Time	Vehicles	Passengers per Vehicle	Depature Time	Vehicles	Passengers per Vehicle
20 Garema Court	Curtis	Friday 30/4/10	11:00-15:00	59	1.44	11:00-15:00	4	2.25
20 Garema Court	Curtis	Saturday 1/5/10	18:30-22:30	3	1	18:30-22:30	11	1
Green Valley Mosque	ttm Transport Data	Friday 1/7/11	11:00-15:00	30	1.4	11:00-15:00	37	1.54
Smithfield Mosque	ttm Transport Data	Friday 1/7/11	11:00-15:00	13	1.08	11:00-15:00	13	1.08
Bonnyrigg Mosque	ttm Transport Data	Friday 1/7/11	11:00-15:00	95	1.48	11:00-15:00	95	1.38
6 Metcalfe St, Wallsend	R.O.A.R Data	Friday 1/7/11	11:30-15:30	152	1.59	11:30-15:30	148	1.59
			Weighted Average		1.5	Weighted Average		1.49

3.0 PARKING PROVISION

Application of parking rates contained in Newcastle City Council's DCP has not been adequately justified by the applicant or by TPK. It is usual and standard practice to undertake detailed comparative surveys of parking demand at similar developments in order to assess the likely parking demands of a proposed development. One of the key parameters in identifying parking demand and appropriate parking rates is public transport accessibility and reduced car mode share targets. In the absence of adequate supporting information from the applicant, it is instructive to undertake more rigorous assessment of public transport accessibility and likely parking demand from surveys at existing similar developments, as outlined in the previous section of this report.

Peak attendance levels of 400 and 450 persons are identified in Table 4 of the TPK report for the typical Friday (52 times per year) *Jumaa Prayer* and the twice a year *Eidul Fitr / Eidul Adha Prayers* respectively.

With a maximum attendance of 400 people during the weekly Friday prayer session and a car occupancy rate of 1.5 people per car, this results in a requirement of **267** on-site car parking spaces. This has not been met by the application, which will only provide **162** on-site parking spaces. This will result in a significant overspill of vehicles parking on nearby streets or in the shopping centre opposite, in the order of some **105** vehicles.

The maximum attendance of 450 persons specified in the TPK report would generate a peak parking demand for some **300** vehicles again resulting in overspill parking effects of some **138** vehicles.

The TPK report identifies that the 450 attendee level should be treated as a Major Event and be subject to a Traffic & Parking Management Plan that requires Council approval prior to the event. It is queried as to how the extra 50 attendees causes a need for traffic & parking management beyond the 400 attendee level. At the TPK parking rate of 1 per 3 persons this equates to 17 more cars or double that to 34 cars for the more appropriate 1.5 person per car occupancy rate.

Any overflow of parking that requires management by Council by the installation of *"No Parking"* zones on local streets, as suggested in Appendix C of the TPK report is unreasonable in terms of impacts on other users of the nearby kerbside parking areas as well as being difficult to enforce.

4.0 TRAFFIC IMPACT

A revised traffic impact study has been undertaken as part of this assessment to incorporate intersection assessments for the new mosque one which takes into account the effect of the shopping centre exit driveway opposite the access, offset by some 10m to 20m. This driveway should be included in the assessment, and should be including as a fourth leg to the intersection.

A traffic count was undertaken at the shopping centre driveway from 11.30am to 3.30pm on Friday 1st July 2011. The results of this count are included as **Annexure B**.

Concept designs for all of the intersections analysed are provided in **Annexure C**. Intersection performances were analysed using SIDRA intersection version 5.1. The existing performance of the shopping centre access is shown in the following table.

Annexure D contains demographic data of the mosque locations.

TABLE 1: EXISTING INTERSECTION PERFORMANCE

Intersection	Peak Hour	Degree of Saturation(1)	Average Delay(2) (sec/vehicle)	Level of Service(3)	Queue Length back into Mosque
Croudace Rd / Retail Access	12-1pm	0.31	1.6 (16.3)	A (Worst: B)	-

4.1 Traffic Generation

The car occupancy rate to be expected at this mosque has been shown to be 1.5 people per vehicle. Therefore during the Friday prayer session, which has an attendance of up to 400 people, there will be 267 vehicles arriving before the service and 267 vehicles departing after the service.

4.2 Left In / Left Out Design

The first assessment looked at the left in / left out design as suggested by Council. The future performance using this intersection design is shown in the following table.

TABLE 2: LEFT-IN / LEFT-OUT INTERSECTION PERFORMANCE

Intersection	Peak Hour	Degree of Saturation(1)	Average Delay(2) (sec/vehicle)	Level of Service(3)	Queue Length back into Mosque
Croudace Rd / Retail Access / Mosque Access	12-1pm Start of Service	0.61	4.4 (23.6)	A (Worst: B)	-
Croudace Rd / Retail Access / Mosque Access	12-1pm End of Service	1.06	20.0 (200.1)	B (Worst: F)	167m

This design of intersection will result in an acceptable level of service. However it is not desirable, as it forces all vehicles to turn left and head south from the mosque at the end of the service. Attendees who wish to head north will be either perform U / 3-point turns within the carriageway of Croudace Road (using driveways or intersections), which will cause localised road safety

and congestion issues or use local residential streets resulting in potential residential amenity impacts that have not been quantified. Given these difficulties attendees may prefer to park off-site (particularly the shopping centre opposite) so that departure from the site is quicker. This raises issues of pedestrian safety crossing Croudace Road.

4.3 No Right Turn ENTRY

Banning the right turn ENTRY is acceptable, as on arrival vehicles from the south can continue up to the existing roundabout intersection with Cardiff Road, perform a safe U turn here and then turn left into the site. However for safety reasons described previously, the right turn out of the site should be allowed. Under this give way intersection design, the combined mosque / supermarket intersection on Croudace Road will perform as shown in the following table. It is a reasonable expectation and assessment criteria that developments with access from high volume / important access corridors be assessed under a 10 year growth rate performance scenario, as shown below.

TABLE 3: NO RIGHT TUR ENTRY INTERSECTION PERFORMANCE

Intersection	Peak Hour	Degree of Saturation(1)	Average Delay(2) (sec/vehicle)	Level of Service(3)	Queue Length back into Mosque
FUTURE 2011 PERFORMANCE					
Croudace Rd / Retail Access / Mosque Access	12-1pm Start of Service	0.61	4.4 (23.6)	A (Worst: B)	-
Croudace Rd / Retail Access / Mosque Access	12-1pm End of Service	1.53	153.6 (503.1)	F (Worst: F)	917m **INTOLERABLE**
FUTURE 2021 PERFORMANCE (2% GROWTH OVER 10 YEARS)					
Croudace Rd / Retail Access / Mosque Access	12-1pm **Start** of Service	0.68	4.8 (41.3)	**A** (Worst: C)	-
Croudace Rd / Retail Access / Mosque Access	12-1pm **End** of Service	2.12	281.9 (1037.4)	**F** (Worst: F)	1369m **INTOLERABLE**

It can be seen that while this intersection design does solve the issues related to banning the right turn movement out of the site, the intersection will not operate at an acceptable level in the future. Vehicles turning right out of the site will not be able to leave due to a lack of acceptable gaps in the traffic. This will result in excessive queuing back into the site and congestion issues internally.

This issue is also caused by the fact that the development application only includes one combined exit lane, so vehicles wishing to turn left onto Croudace Road still have to queue behind vehicles wishing to turn right. If two exit lanes were provided, one left turn and one right turn, this problem may be eased but not overcome as insufficient gaps are available in the traffic stream along Croudace Road.

4.4 Signalised Intersection

Under a give way intersection design, vehicles are unable to turn right out of the mosque site, due to the large volume of traffic on Croudace Road and lack of acceptable gaps. Therefore an intersection which allows vehicles to turn right out of the site must be investigated.

The first possibility is a signalised intersection which combines the mosque access and supermarket access into one 36m wide intersection. See **Annexure C** for a concept design. The SIDRA results of this intersection are shown in the following table.

TABLE 4: TRAFFIC SIGNAL INTERSECTION PERFORMANCE

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/vehicle)	Level of Service[3]	Queue Length back into Mosque
FUTURE 2011 PERFORMANCE					
Croudace Rd / Retail Access / Mosque Access	12-1pm Start of Service	0.87	16.4	B	-
Croudace Rd / Retail Access / Mosque Access	12-1pm End of Service	0.88	24.8	B	130m
FUTURE 2021 PERFORMANCE (2% GROWTH OVER 10 YEARS)					
Croudace Rd / Retail Access / Mosque Access	12-1pm Start of Service	0.89	17.0	B	-
Croudace Rd / Retail Access / Mosque Access	12-1pm End of Service	0.91	32.5	C	182.4m

It can be seen from this table that a signalised intersection will alleviate much of the problems associated with vehicles unable to turn right out of the mosque site. This will result in much shorter queue lengths back into the mosque site, and an acceptable level of service performance for the intersection. Traffic signals can only be approved for installation by the RTA.

4.5 Roundabout Intersection

The second intersection design that may allow easier access out of the site is a roundabout intersection. See **Annexure C** for a concept design of this roundabout. Under a roundabout operation the mosque access will operate as shown in the following table.

TABLE 5: ROUNDABOUT INTERSECTION PERFORMANCE

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/vehicle)	Level of Service[3]	Queue Length back into Mosque
FUTURE 2011 PERFORMANCE					
Croudace Rd / Retail Access / Mosque Access	12-1pm **Start** of Service	0.86	14.5 (22.5)	**B** (Worst: B)	-
Croudace Rd / Retail Access / Mosque Access	12-1pm **End** of Service	0.78	12.4 (21.1)	**A** (Worst: B)	80.6m
FUTURE 2021 PERFORMANCE (2% GROWTH OVER 10 YEARS)					
Croudace Rd / Retail Access / Mosque Access	12-1pm **Start** of Service	0.98	24.7 (42.0)	**B** (Worst: C)	-
Croudace Rd / Retail Access / Mosque Access	12-1pm **End** of Service	0.87	16.6 (35.2)	**B** (Worst: C)	121.6m

It can be seen that the roundabout intersection design will again alleviated problems associated with excessive queuing due to vehicles unable to turn right out of the mosque site. It will also result in a more acceptable intersection level of service than a give way design. A roundabout at this point could also act as a traffic calming device along Croudace Road.

A roundabout intersection design would not be combined with the supermarket EXIT driveway access. The vehicles turning right out of the mosque would be added to the vehicles travelling past the supermarket access, and as such the supermarket access should be assessed to determine the effect, as shown below for the critical period at the end of the Friday mosque service.

TABLE 6: RETAIL EXIT DRIVEWAY PERFORMANCE

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/vehicle)	Level of Service[3]	Queue Length back into Mosque
FUTURE 2011 PERFORMANCE					
Croudace Rd / Retail Access	12-1pm **Start** of Service	0.50	2.6 (32.5)	**A** (Worst: C)	-
FUTURE 2021 PERFORMANCE (2% GROWTH OVER 10 YEARS)					
Croudace Rd / Retail Access	12-1pm **Start** of Service	0.84	5.2 (89.0)	**A** (Worst: F)	-

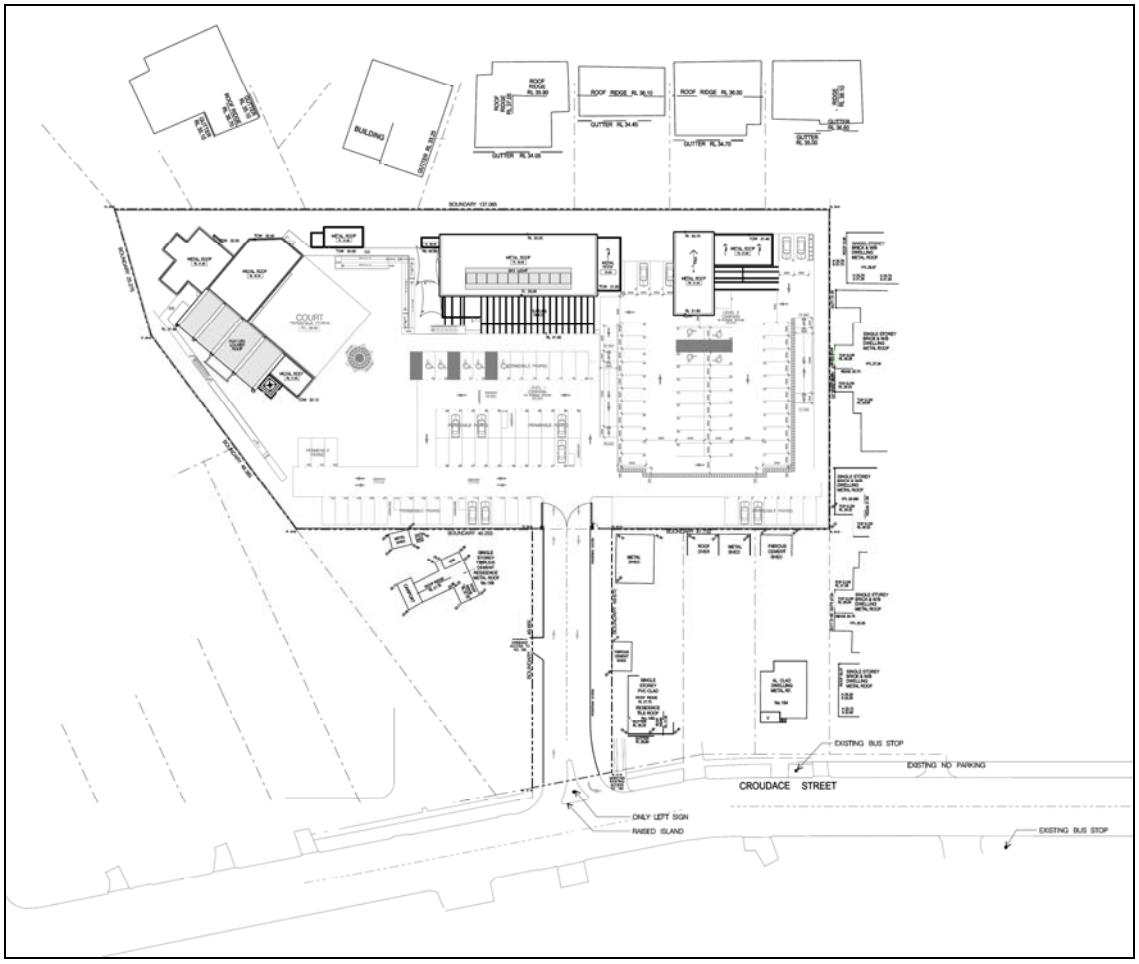
It can be seen that the roundabout intersection design will adversely impact the ability of right turning traffic to leave the Elermore Shopping Centre car park opposite, by reducing the Level of Service from "C" (Satisfactory performance) to "F" (Poor Performance / Over Saturated / Extra Capacity Required). Thus the roundabout option would require other capacity improvements to be considered for the existing EXIT driveway from the Elermore Shopping Centre opposite the site.

The roundabout option would also potentially require localised property acquisition to accommodate public pedestrian access along the affected public road verges on either side of the public road carriageway.

4.6 Secondary Access Point

Consideration of any secondary access point would require a separate development application. It is noted that the only road frontage serving the subject property is restricted 15m long frontage to Croudace Road, as shown in the diagram below. Thus further property access would be necessary to consider alternative or supplementary vehicular access.

Any secondary access or revised vehicular access plan should adequately address impacts upon nearby local residential streets, including residential amenity impacts in accordance with *Table 4.6* of the RTA's *"Guide to Traffic Generating Developments"* (October 2002).



5.0 OTHER ACCESS CONSIDERATIONS

5.1 Driveway of Number 160 Croudace Road

Access designs submitted for the development show the existing driveway for property 160 Croudace Road, Elermore Vale being located in the future on the corner (kerb return) of the mosque access. This will violate Clause 3.2.3 of AS2890.1 and render access to this property to be unsafe.

5.2 Pedestrian Access

The submitted vehicular access design depicts a road profile junction rather than a driveway junction with Croudace Road. The impact of pedestrian flow (including aged / disabled access) activity along the eastern footpath of Croudace Road has not been addressed in the lodged traffic report. Engineering detail may address this aspect.

6.0 CONCLUSION

In view of the foregoing, it is evident that:

1. The appropriate parking rate for the design Friday noon / early afternoon service should be based upon a car occupancy rate of 1.5 persons per car, rather than the car occupancy rate of 3 persons per car adopted in the TPK report.

2. The proposed development will create significant overspill parking effects for both the typical peak design Friday service and on special service days. The scale of overspill parking effects is unreasonable and will create local adverse impacts. It is inappropriate to rely upon the traffic & parking management plan outlined in Appendix C of the TPK report to control the traffic and parking impacts of the proposed development for the design Friday service and on special service days.

3. With a maximum attendance of 400 people during the weekly Friday prayer session and a car occupancy rate of 1.5 people per car, this results in a requirement of **267** on-site car parking spaces. This has not been met by the application, which will only provide **162** on-site parking spaces. This will result in a significant overspill of vehicles parking on nearby streets or in the shopping centre opposite, in the order of some **105** vehicles.

4. The maximum attendance of 450 persons specified in the TPK report would generate a peak parking demand for some **300** vehicles again resulting in overspill parking effects of some **138** vehicles.

5. The external traffic impact of 400 to 450 attendees cannot be resolved at the 15m long restricted Croudace Road frontage of the site under *GIVE WAY*, *STOP* or roundabout control modes. Traffic signals may be considered subject to a detailed application involving close consultation with the RTA.

6. Consideration of any secondary access point would require a separate development application. It is noted that the only road frontage serving the subject property is restricted 15m long frontage to Croudace Road, as shown in the diagram below. Thus further property access would be necessary to consider alternative or supplementary vehicular access.

7. Access designs submitted for the development show the existing driveway for property 160 Croudace Road, Elermore Vale being located in the future on the corner (kerb return) of the mosque access. This will violate Clause 3.2.3 of AS2890.1 and render access to this property to be unsafe.

8. The submitted vehicular access design depicts a road profile junction rather than a driveway junction with Croudace Road. The impact of pedestrian flow (including aged / disabled access) activity along the eastern footpath of Croudace Road has not been addressed in the lodged traffic report. Engineering detail may address this aspect.

Accordingly, the proposed development in its current form creates unacceptable on-site parking and external traffic impacts and is unable to be ameliorated by works or conditions of consent as the extent of impacts are of a scale that require a new DA.

The external traffic impact of any revised development application for the site needs to fully assess the impacts on Croudace Road, the driveways serving the Elermore shopping Centre opposite, local residential streets (including residential amenity impacts in accordance with Table 4.6 of the RTA's "Guide to Traffic Generating Developments") and the adjacent driveway serving 160 Croudace Road to the immediate south of the frontage.

ANNEXURE A: CAR OCCUPANCY SURVEY RESULTS (Sheet 1 of 6)

Curtis Traffic Surveys

Job:	100306tx
Day, date	Fri 30 Apr 10
Location:	20 Garema Ct
Weather:	Fine
Surveyor	MC

Time Start	Groups arriving by car, vehicle occupancy					Other arrivals			Groups departing by car, vehicle occupancy					Other departures				
11:00	1	2	3	4	5+	p offs	Taxi	Walking, origin out of sight	1	2	3	4	5+	Pick ups	Taxi	Walking, destination out of sight	walking toward off street c.p.	Persons walking south of mosque
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
11:30	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
11:45	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0		
12:00	1	1	2	0	0	1	0	3	0	0	0	0	0	0	0	2		
12:15	16	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0		
12:30	12	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
12:45	7	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0
13:15	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	37	8
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ANNEXURE A: CAR OCCUPANCY SURVEY RESULTS (Sheet 2 of 6)

Curtis Traffic Surveys

Job: 100306tx
Day, date: Sat 1 May 10
Location: 20 Garema Ct
Weather: Fine
Surveyor: MC

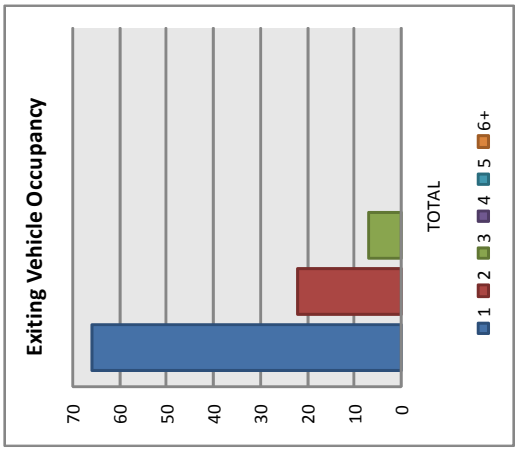
Time Start	Groups arriving by car, vehicle occupancy					Other arrivals			Groups departing by car, vehicle occupancy					Other departures				
18:30	1	2	3	4	5+	P offs	Taxi	Walking, origin out of sight	1	2	3	4	5+	Pick ups	Taxi	Walking, destination out of sight	walking toward off street c.p.	Persons walking south of mosque
18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:00	1	0	0	0	0	1	0	0	3	0	0	0	0	0	0	0	0	0
19:15	1	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
19:30	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
19:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:30	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
21:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

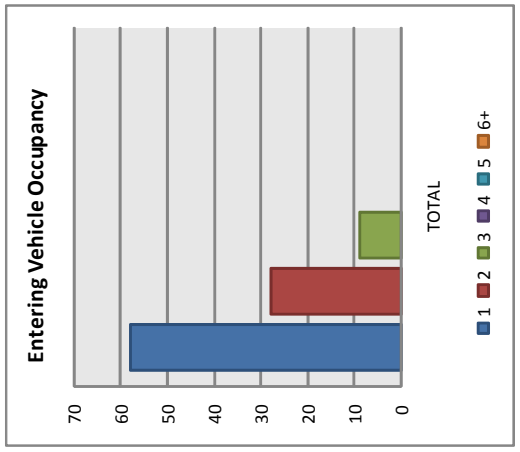
ANNEXURE A: CAR OCCUPANCY SURVEY RESULTS
(Sheet 3 of 6)

TTM Data

TTM Reference: 80804
Site Location: Bonnyrigg Mosque
Date: Friday 01-07-11
Survey Duration: 1100-1500
Weather: Fine
Notes:

Time	Entering Vehicles							Leaving Vehicles						
10 Min	Number of Passengers							Number of Passengers						
time start	1	2	3	4	5	6+	Total	1	2	3	4	5	6+	Total
1100	2	0	0	0	0	0	2	0	0	0	0	0	0	0
1115	4	0	0	0	0	0	4	0	0	0	0	0	0	0
1130	6	0	0	0	0	0	6	0	0	0	0	0	0	0
1145	11	2	0	0	0	0	13	0	0	0	0	0	0	0
1200	18	10	3	0	0	0	31	0	0	0	0	0	0	0
1215	10	8	6	0	0	0	24	0	0	0	0	0	0	0
1230	4	8	0	0	0	0	12	0	0	0	0	0	0	0
1245	0	0	0	0	0	0	0	30	5	0	0	0	0	35
1300	0	0	0	0	0	0	0	19	13	7	0	0	0	39
1315	0	0	0	0	0	0	0	2	4	0	0	0	0	6
1330	1	0	0	0	0	0	1	1	0	0	0	0	0	1
1345	0	0	0	0	0	0	0	1	0	0	0	0	0	1
1400	0	0	0	0	0	0	0	2	0	0	0	0	0	2
1415	0	0	0	0	0	0	0	11	0	0	0	0	0	11
1430	1	0	0	0	0	0	1	0	0	0	0	0	0	0
1445	1	0	0	0	0	0	1	0	0	0	0	0	0	0
TOTAL	58	28	9	0	0	0	95	66	22	7	0	0	0	95



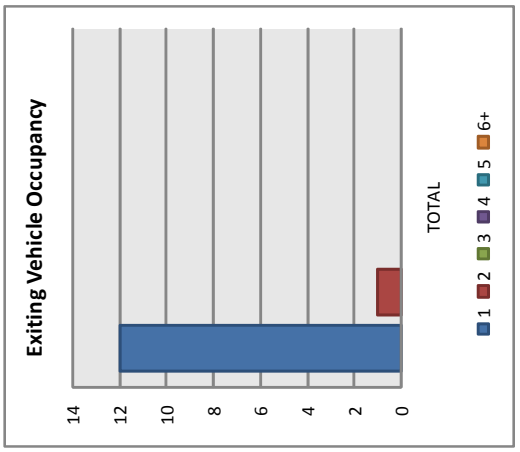


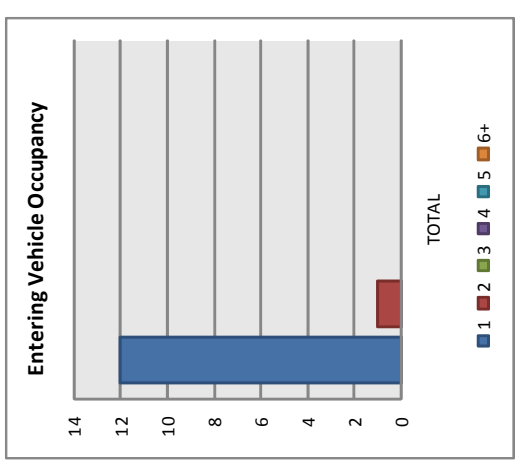
ANNEXURE A: CAR OCCUPANCY SURVEY RESULTS
(Sheet 4 of 6)

TTM Data

TTM Reference: 80804
Site Location: Smithfield Mosque
Date: Friday 01-07-11
Survey Duration: 1100-1500
Weather: Fine
Notes:

Time	Entering Vehicles							Leaving Vehicles						
10 Min	Number of Passengers							Number of Passengers						
time start	1	2	3	4	5	6+	Total	1	2	3	4	5	6+	Total
1100	1	0	0	0	0	0	1	0	0	0	0	0	0	0
1115	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1130	1	0	0	0	0	0	1	0	0	0	0	0	0	0
1145	1	0	0	0	0	0	1	0	0	0	0	0	0	0
1200	2	0	0	0	0	0	2	0	0	0	0	0	0	0
1215	3	0	0	0	0	0	3	0	0	0	0	0	0	0
1230	3	0	0	0	0	0	3	0	0	0	0	0	0	0
1245	1	1	0	0	0	0	2	2	0	0	0	0	0	2
1300	0	0	0	0	0	0	0	8	1	0	0	0	0	9
1315	0	0	0	0	0	0	0	1	0	0	0	0	0	1
1330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1345	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1415	0	0	0	0	0	0	0	1	0	0	0	0	0	1
1430	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1445	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	12	1	0	0	0	0	13	12	1	0	0	0	0	13



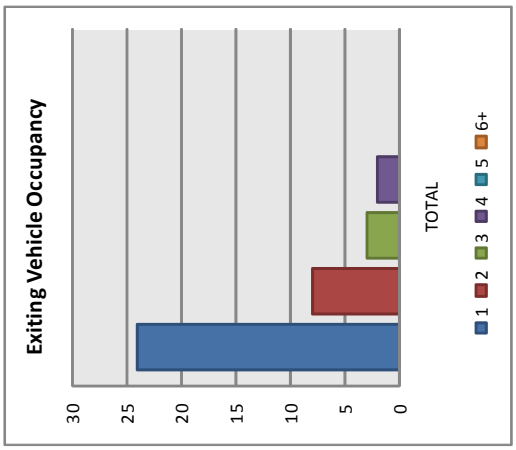


ANNEXURE A: CAR OCCUPANCY SURVEY RESULTS
(Sheet 5 of 6)

TTM Data

TTM Reference: 80804
Site Location: Green Valley Mosque
Date: Friday 01-07-11
Survey Duration: 1100-1500
Weather: Fine
Notes:

Time	Entering Vehicles							Leaving Vehicles						
10 Min	Number of Passengers							Number of Passengers						
time start	1	2	3	4	5	6+	Total	1	2	3	4	5	6+	Total
1100	1	0	0	0	0	0	1	1	0	0	0	0	0	1
1115	3	1	0	0	0	0	4	2	0	0	0	0	0	2
1130	0	2	0	0	0	0	2	1	0	0	0	0	0	1
1145	5	0	0	0	0	0	5	1	0	1	0	0	0	2
1200	2	1	0	0	0	0	3	1	1	0	0	0	0	2
1215	0	1	0	0	0	0	1	1	0	0	0	0	0	1
1230	0	0	0	0	0	0	0	1	0	0	0	0	0	1
1245	1	1	0	0	0	0	2	0	0	0	0	0	0	0
1300	1	1	1	0	0	0	3	2	0	0	0	0	0	2
1315	0	1	0	0	0	0	1	0	0	0	0	0	0	0
1330	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1345	3	2	0	0	0	0	5	1	1	0	2	0	0	4
1400	2	0	0	0	0	0	2	9	2	2	0	0	0	13
1415	0	0	0	0	0	0	0	4	3	0	0	0	0	7
1430	0	0	0	0	0	0	0	0	1	0	0	0	0	1
1445	1	0	0	0	0	0	1	0	0	0	0	0	0	0
TOTAL	19	10	1	0	0	0	30	24	8	3	2	0	0	37



ANNEXURE A: CAR OCCUPANCY SURVEY RESULTS
(Sheet 6 of 6)

R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : McLaren Traffic Engineering
Job No / Name : 3660 WALLSEND 6 Metcalfe St
Day/Date : Friday 1st June 2011

On Street Parking

Time Period	ARRIVE 1	2	3	4	5	Occupancy	Time Period	DEPART 1	2	3	4	5	Occupancy
1130 - 1145	0	0	0	0	0	**0**	1130 - 1145	0	0	0	0	0	**0**
1145 - 1200	1	0	0	0	0	**1**	1145 - 1200	0	0	0	0	0	**0**
1200 - 1215	0	1	0	0	0	**2**	1200 - 1215	0	0	0	0	0	**0**
1215 - 1230	2	0	0	0	0	**2**	1215 - 1230	0	0	0	0	0	**0**
1230 - 1245	7	1	2	1	0	**19**	1230 - 1245	0	0	0	0	0	**0**
1245 - 1300	8	3	1	1	0	**21**	1245 - 1300	0	0	0	0	0	**0**
1300 - 1315	15	8	10	0	0	**61**	1300 - 1315	0	0	0	0	0	**0**
1315 - 1330	25	14	3	0	1	**67**	1315 - 1330	0	0	0	0	0	**0**
1330 - 1345	33	10	2	0	1	**64**	1330 - 1345	0	0	0	0	0	**0**
1345 - 1400	1	0	0	0	0	**1**	1345 - 1400	76	35	12	2	1	**195**
1400 - 1415	0	0	0	0	0	**0**	1400 - 1415	5	1	6	0	1	**30**
1415 - 1430	0	0	0	0	0	**0**	1415 - 1430	1	2	0	0	0	**5**
1430 - 1445	0	0	0	0	0	**0**	1430 - 1445	3	0	0	0	0	**3**
1445 - 1500	0	0	0	0	0	**0**	1445 - 1500	0	0	0	0	0	**0**
1500 - 1515	0	0	1	0	0	**3**	1500 - 1515	0	0	0	0	0	**0**
1515 - 1530	0	0	0	0	0	**0**	1515 - 1530	3	0	0	0	0	**3**
Total Vehicles	**92**	**37**	**19**	**2**	**2**	**241**	***Total Vehicles***	**88**	**38**	**18**	**2**	**2**	**236**

Plus

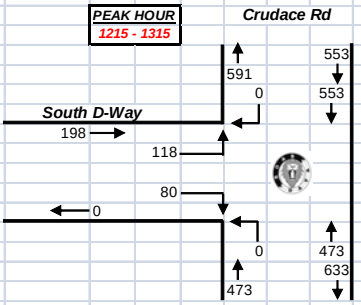
Plus

ANNEXURE B: TRAFFIC COUNT RESULTS

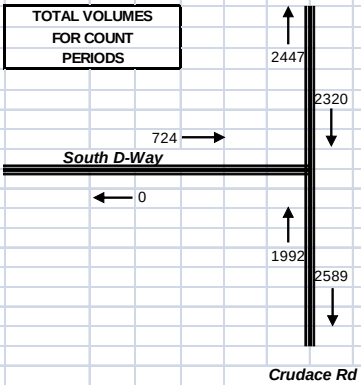
R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

Client	: McLaren Traffic Engineering
Job No/Name	: 3660 WALLSEND 6 Metcalfe St
Day/Date	: Friday 1st July 2011

All Vehicles	WEST		NORTH		SOUTH		
	South D-Way		Crudace Rd		Crudace Rd		
Time Per	L	R	R	T	L	T	TOTAL
1130 - 1145	25	14	0	137	0	137	313
1145 - 1200	18	8	0	132	0	128	286
1200 - 1215	28	16	0	132	0	100	276
1215 - 1230	33	20	0	141	0	122	316
1230 - 1245	18	12	0	132	0	117	279
1245 - 1300	34	28	0	144	0	133	339
1300 - 1315	33	20	0	136	0	101	290
1315 - 1330	18	9	0	115	0	108	250
1330 - 1345	31	28	0	129	0	133	321
1345 - 1400	20	14	0	127	0	107	268
1400 - 1415	24	18	0	148	0	106	296
1415 - 1430	26	20	0	157	0	101	304
1430 - 1445	21	17	0	166	0	136	340
1445 - 1500	30	20	0	159	0	143	352
1500 - 1515	58	13	0	188	0	162	421
1515 - 1530	38	12	0	177	0	158	385
Period End	455	269	0	2320	0	1992	5036

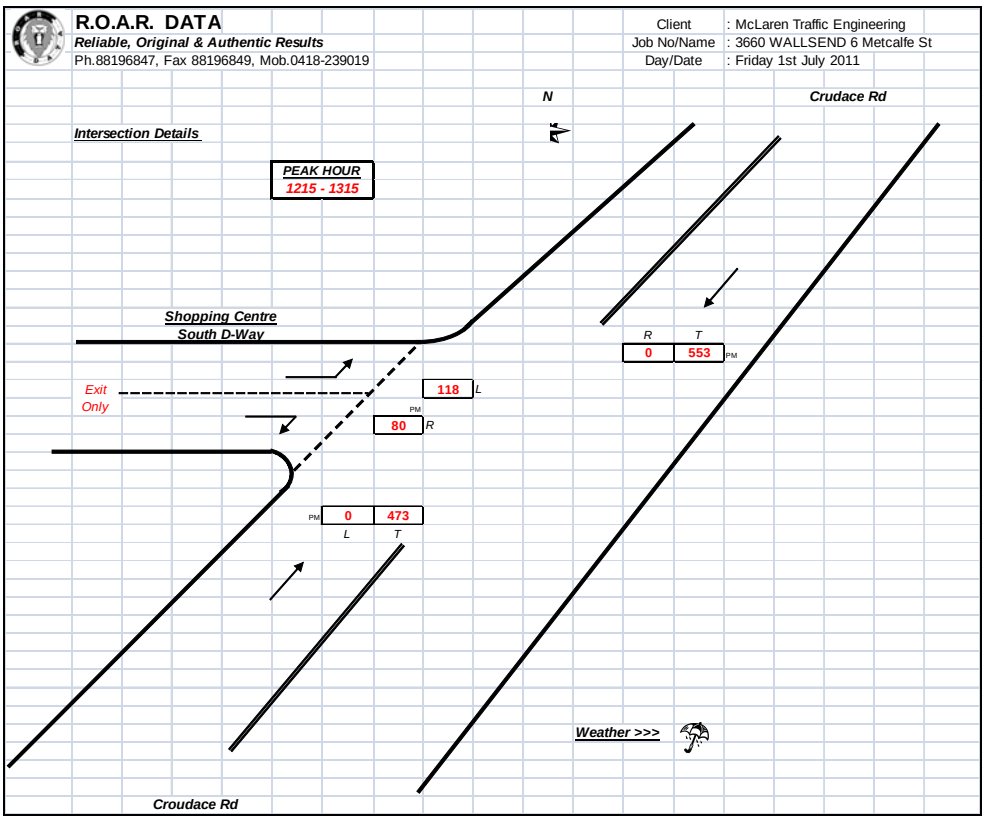


	WEST		NORTH		SOUTH		
	South D-Way		Crudace Rd		Crudace Rd		
Peak Per	L	R	R	T	L	T	TOTAL
1130 - 1230	104	58	0	542	0	487	1191
1145 - 1245	97	56	0	537	0	467	1157
1200 - 1300	113	76	0	549	0	472	1210
1215 - 1315	118	80	0	553	0	473	1224
1230 - 1330	103	69	0	527	0	459	1158
1245 - 1345	116	85	0	524	0	475	1200
1300 - 1400	102	71	0	507	0	449	1129
1315 - 1415	93	69	0	519	0	454	1135
1330 - 1430	101	80	0	561	0	447	1189
1345 - 1445	91	69	0	598	0	450	1208
1400 - 1500	101	75	0	630	0	486	1292
1415 - 1515	135	70	0	670	0	542	1417
1430 - 1530	147	62	0	690	0	599	1498
PEAK HR	118	80	0	553	0	473	1224

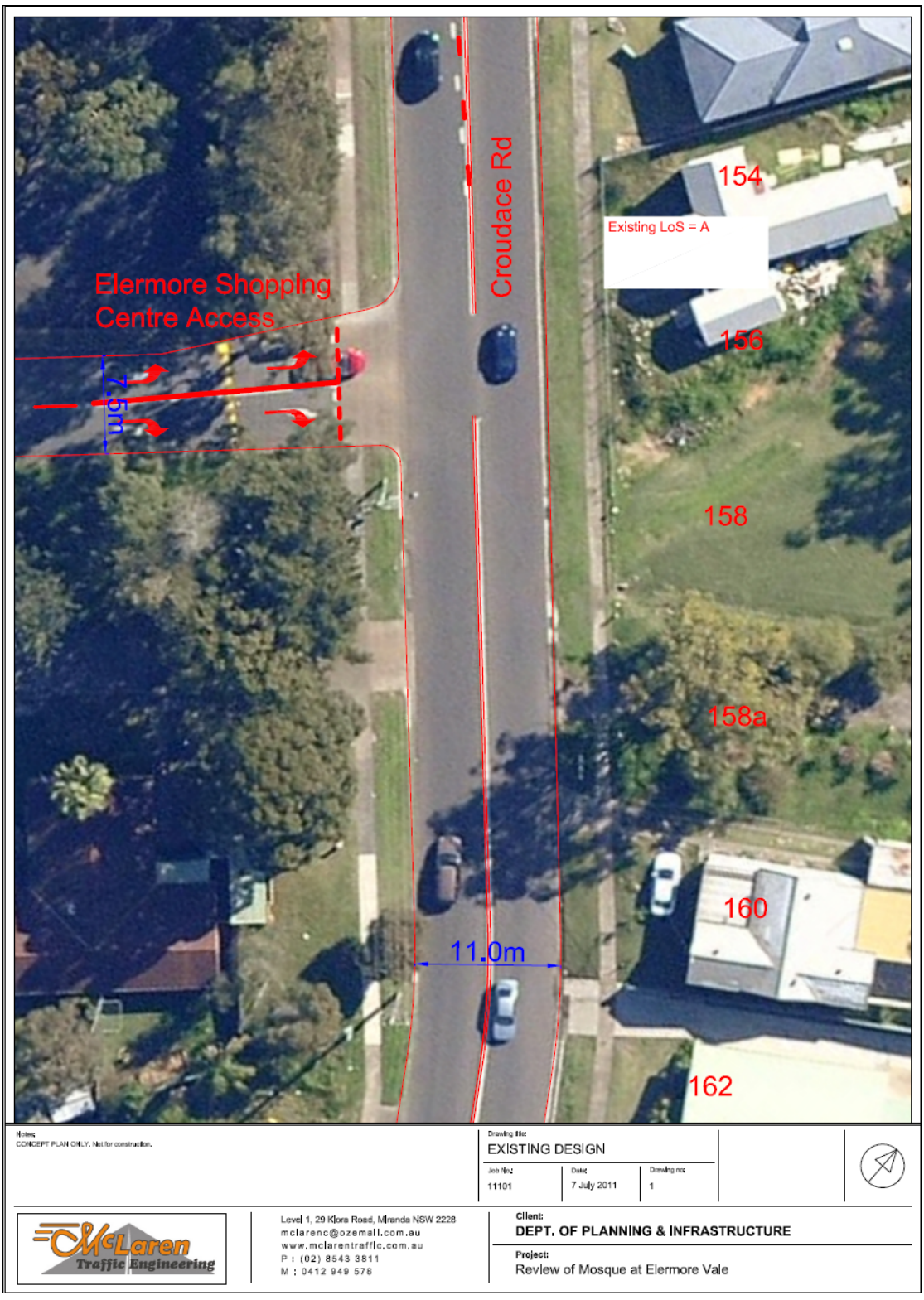


R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

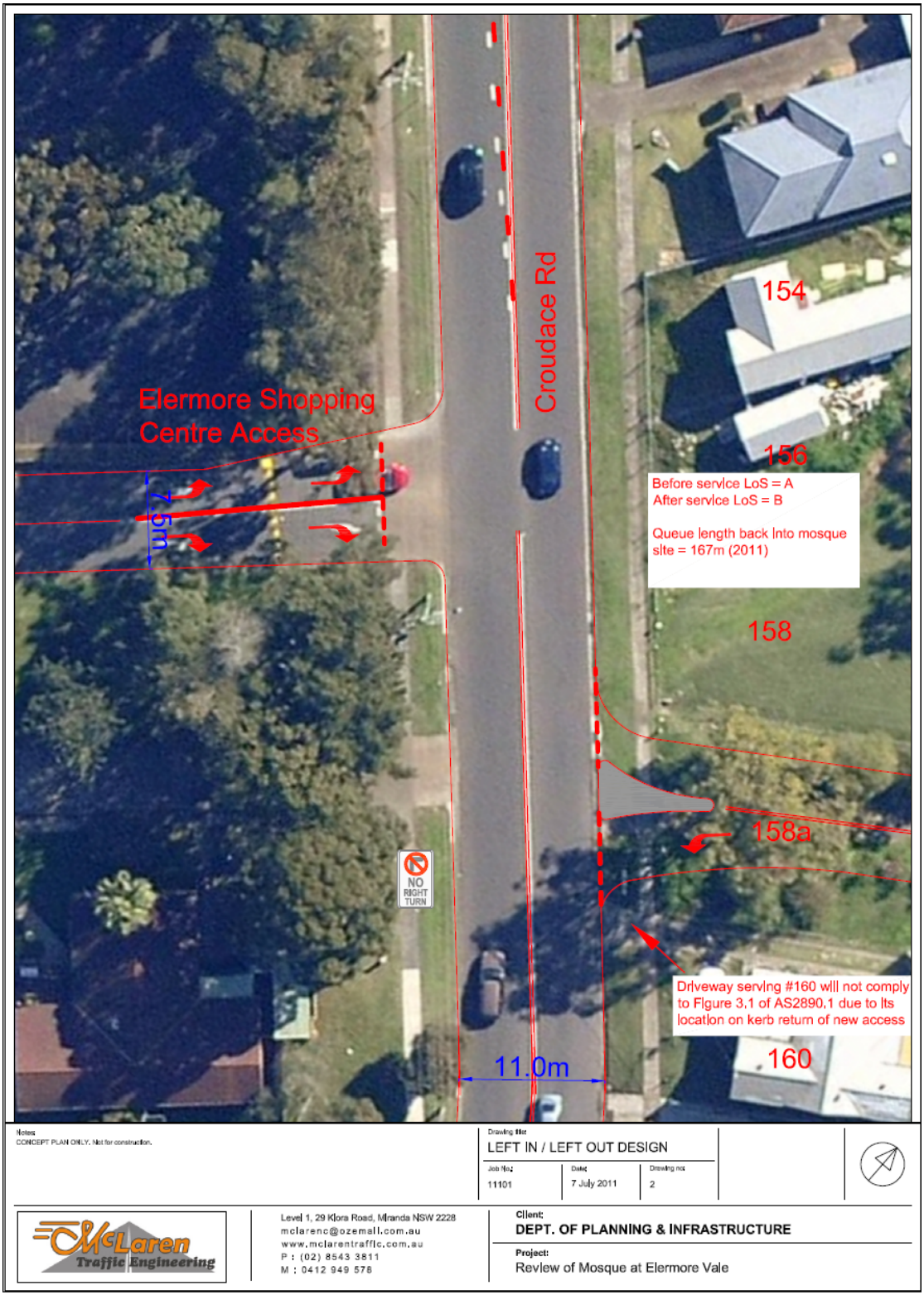
Client	: McLaren Traffic Engineering
Job No/Name	: 3660 WALLSEND 6 Metcalfe St
Day/Date	: Friday 1st July 2011



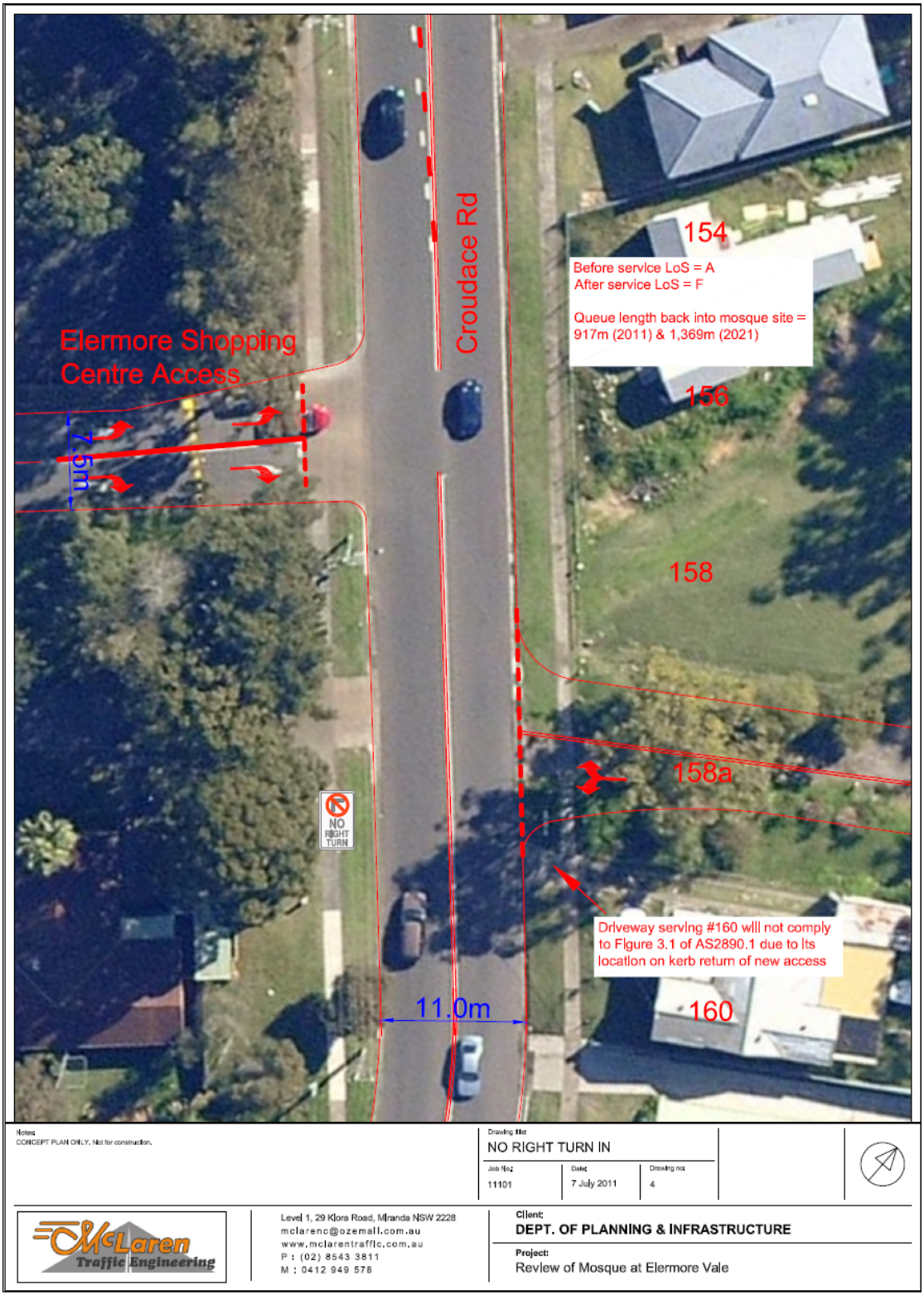
ANNEXURE C: INTERSECTION CONCEPT DESIGNS
(Sheet 1 of 5)



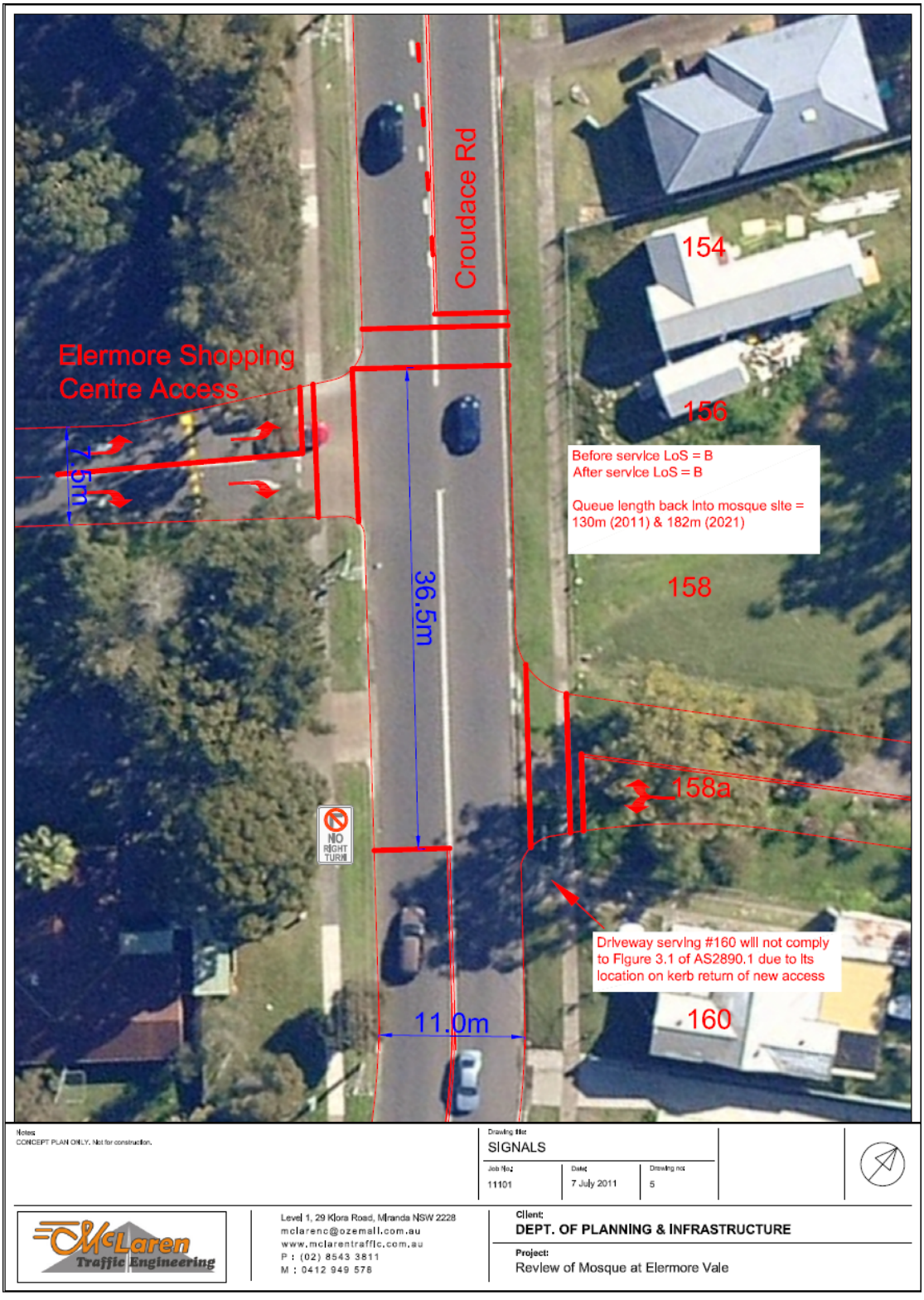
ANNEXURE C: INTERSECTION CONCEPT DESIGNS
(Sheet 2 of 5)



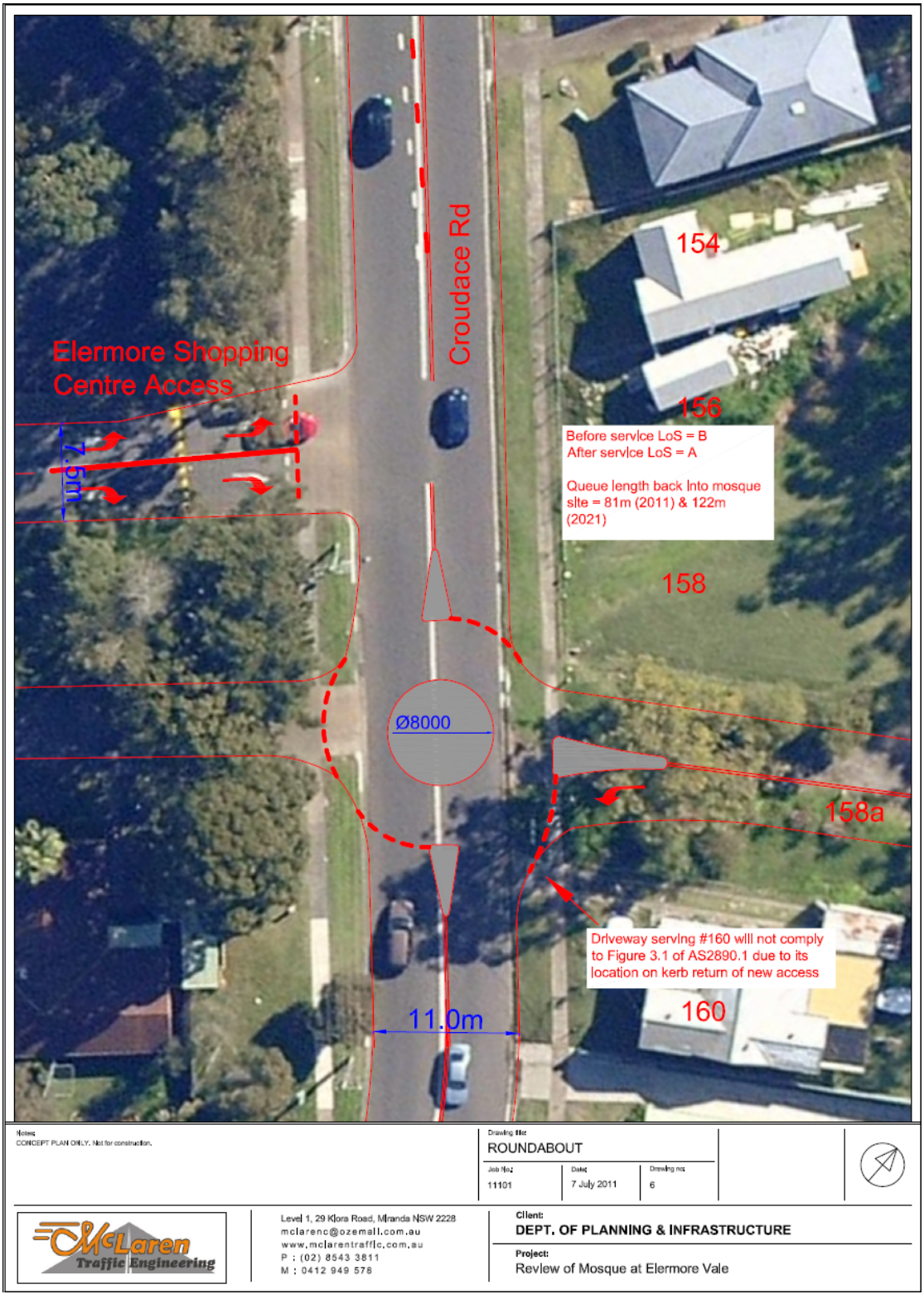
ANNEXURE C: INTERSECTION CONCEPT DESIGNS
(Sheet 3 of 5)



ANNEXURE C: INTERSECTION CONCEPT DESIGNS
(Sheet 4 of 5)



ANNEXURE C: INTERSECTION CONCEPT DESIGNS
(Sheet 5 of 5)



ANNEXURE D: DEMOGRAPHIC DATA
2001 CENSUS (Sheet 1 of 2)

	2001 Census			
	Total population	**Age**	**Gender**	**Religious Affiliation: Islam**
Elermore Vale	4825	0-4 316 (6.5%) 5-14 826 (17.1%) 14-24 797 (16.5%) 25-54 2169 (49.9%) 55–64 358 (7.9%) 65+ 353 (7.3%)	M:2348 (48.6%) F:2477 (51.3%)	Tot: 29 (0.6%) Male: 12 (41.5%) Female: 17 (58.6%)
Wallsend	11513	0-4 755 (6.5%) 5-14 1440 (12.5%) 14-24 1575 (15.6%) 25-54 4618 (40.1%) 55-64 1082 (9.3%) 65+ 2024 (14.5%)	M:5502 (47.8%) F:6011 (52.2%)	Tot: 64 (0.5%) Male: 32 (50%) Female: 32 (50%)
Bonnyrigg	8872	0-4 636 7.1%) 5-14 1608 (18.1%) 14-24 1573 (17.7%) 25-54 3878 (43.7%) 55-64 611 (6.8%) 65+ 543 (6.1%)	M: 4289 (48.3%) F: 4583 (51.7%)	Tot: 416 (4.6%) Male: 191 (45.9%) Female: 225 (54.1%)
Green Valley	11562	0-4 1132 (9.7%) 5-14 2206 (19.0%) 14-24 1731 (14.9%) 25-54 5376 (46.6%) 55-64 605 (5.2%) 65+ 476 (4.1%)	M: 5699 (49.7%) F: 5863 (50.7%)	Tot: 855 (7.3%) Male: 435 (50.8%) Female:420 (49.2%)
Smithfield	10382	0-4 689 (6.6%) 5-14 1421 (13.6%) 14-24 1465 (14.1%) 25-54 4264 (41.0%) 55-64 1071 (10.3%) 65+ 1446 (13.9%)	M: 5172 (49.8%) F: 5210 (50.2%)	Tot: 402 (3.8%) Male: 199 (49.5%) Female: 203 (50.5%)
Sydney Statistical Division	3997321	0-4 265175 (6.6%) 5-14 533651 (13.3%) 15-24 551226 (13.7%) 25-54 1781684 (44.5%) 55-64 347103 (8.6%) 65+ 469176 (11.7%)	M:1967687 (49.2%) F:2029634 (50.8%)	Tot:134366 (3.3%) Male: 70812 (52.7%) Female: 63554 (47.3%)
NSW	6371745	0-4 422341 (6.6%) 5-14 891009 (13.9%) 15-24 845345 (13.2%) 25-54 2731604 (42.8%) 55-64 592394 (9.2%) 65+828475 (13.0%)	M: 3145445(49.3%) F: 3226300 (50.7%)	Total: 140907 (2.2%) M: 74419 (52.8%) F: 66488 (47.2%)

ANNEXURE D: DEMOGRAPHIC DATA
2006 CENSUS (Sheet 2 of 2)

	2001 Census			
	Total population	**Age**	**Gender**	**Religious Affiliation: Islam**
Elermore Vale	4730	0-4 296 (6.2%) 5-14 654 (13.8%) 14-24 802 (16.9%) 25-54 1975 (41.7%) 55–64 575 (12.1%) 65+ 428 (9.0%)	M:2294 (48.4%) F:2436 (51.5%)	Tot: 28 (0.5%) Male: 13 (46.4%) Female:15 (53.5%)
Wallsend	11798	0-4 720 (6.1%) 5-14 1451 (12.2%) 14-24 1498 (12.6%) 25-54 4542 (38.4%) 55–64 1308 (11.0%) 65+ 2280 (19.3%)	M:5603 (47.5%) F:6195 (52.5%)	Tot: 72 (0.6%) Male: 37 (51.3%) Female: 35 (48.6%)
Bonnyrigg	8303	0-4 567 (6.8%) 5-14 1385 (16.6%) 14-24 1440 (17.3%) 25-54 3464 (41.7%) 55–64 788 (9.5%) 65+ 660 (7.9%)	M: 4006 (48.2%) F: 4297 (51.7%)	Tot: 365 (4.3%) Male: 182 (49.8%) Female:183 (50.2%)
Green Valley	11959	0-4 1005 (8.4%) 5-14 2171 (18.1%) 14-24 1938 (16.2%) 25-54 5338 (44.6%) 55–64 878 (7.3%) 65+ 637 (5.3%)	M: 5896 (49.3%) F: 6063 (50.7%)	Tot: 941 (7.8%) Male: 478 (50.7%) Female: 463 (50.3%)
Smithfield	11107	0-4 762 (6.8%) 5-14 1545 (13.9%) 14-24 1449 (13.0%) 25-54 4484 (40.3%) 55-64 1259 (11.3%) 65+ 1609 (14.4%)	M: 5550 (49.9%) F: 5557 (50.1%)	Tot: 626 (5.6%) Male: 325 (51.9%) Female: 301 (48.1%)
Sydney Statistical Division	4 119 191	0-4 270815 (6.5%) 5-14 534217 (12.9%) 15-24 569894 (13.8%) 25-54 1 816109 (19.8%) 55-64 422185 (10.2%) 65+ 505974 (12.2%)	M: 2028730 (49.2%) F: 2090461 (50.8%)	Tot:161163 (3.9%) Male:83950 (52.0%) Female:77213 (48.0%)
NSW	6549178	0-4 420431 (6.4%) 5-14 878483 (13.4%) 15-24 871717 (13.3%) 25-54 2753219 (27.5%) 55-64 791551 (12.0%) 65+ 905 778 (13.8%)	M:3228451 (49.2%) F:3320727 (50.8%)	Total:168785 (2.5%) M: 88170 (52.2%) F: 80615 (47.8%)