M^CLAREN TRAFFIC ENGINEERING

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

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

Division of RAMTRANS Australia ABN: 45067491678 RPEQ: 19457

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

1st December 2020 Reference: 200379.03FA

Pathways Property Group Pty Ltd
Suite 6.02, 120 Sussex Street
Sydney NSW 2000
Attention: Elyse Kenny

LETTER OF RESPONSE TO COUNCIL COMMENTS FOR PROPOSED AGED CARE FACILITY AND COMMERCIAL DEVELOPMENT AT 4 – 18A & 274 – 274A LONGUEVILLE ROAD, LANE COVE

Dear Elyse,

Reference is made to your request to provide Letter of Response to Council Comments for the Proposed Aged Care Facility and Commercial Development at 4 – 18A & 274 – 274A Longueville Road, Lane Cove (Amended Proposed Plans in **Annexure A**). This letter is in response to Lane Cove Council's comments within a letter dated 18 November 2020 for DA Number 113/2020. The comments made by Council relevant to traffic and parking are shown below (italicised) with *M^CLaren Traffic Engineering*'s (MTE) response thereafter.

It is noted that **MTE** has previously addressed Council's comments within a *Letter of Response* dated 14th October 2020 (reference: 200379.02FB), of which largely mirror the issues raised by Council as responded to within this letter.

> ***2) Traffic***
>
> *Council's Traffic Engineer has reviewed the application and recommends that the development not be supported at this stage until the following issues are addressed through the submission of amended plans:*
>
> **Accessible parking**
>
> • *One of the proposed accessible parking spaces does not comply with AS2890.6. The three (3) accessible parking spaces shall all comply.*
>
> • *The accessible parking spaces are required to be located as close to the lift as possible.*

MTE Response: The plans have been updated such that all disabled car parking spaces comply with the relevant controls of *AS2890.6:2009* as shown in **Annexure A**. The disabled car parking spaces are located within close proximity to lifts.

• *Access in/out of spaces 18 and 19 require vehicles to reverse onto the circular ramp with limited visibility. As such, these spaces are to be deleted.*

MTE Response: The circular portion on Level 2 is flat, as the ramp ends further to the south, such that there are unrestricted sight lines to both of these spaces for vehicles travelling along the ramp and also adequate visibility for vehicles entering and leaving these car parking spaces.

Driveway

• *The driveway is to be designed as a left-in and left-out only. The design should prevent right-turn movements by installing a triangular median island at the entry/exit of the driveway. Details of the driveway showing this restriction is to be provided.*

MTE Response: This type of design can be accommodated, but in the first instance the preference would be to restrict vehicle movements into and out of the site via a raised median located within Northwood Road, subject to approval by Council's Local Traffic Committee.

Ground clearance

• *AutoCAD files of the ground clearance test is to be provided for a B99 and MRV as the plan provided is unclear.*

MTE Response: AutoCAD files of the ground clearance tests for a B99 and MRV have been provided to Council as part of the previous response letter (ref 200379.02FB), showing successful vertical clearance.

A drop box link is also provided below for ease of access to the AutoCAD file.

https://www.dropbox.com/s/2ip3yvhgpjxo4fe/2924-DA104-LEVEL%204%20GROUND%20FLOOR%20PLAN-%28DA1%29_200810%20-%20MTE%20Vert%20Clearance%20Test.dwg?dl=0

Traffic generation / analysis

• *A Safety and Functionality Report is required for the proposed traffic signal outlining the potential wait times/queue lengths and location of the loops.*

MTE Response: A queuing assessment has been undertaken to determine the queue impacts as a result of the single lane ramp. The following are relevant to note:

- The basement serving the single lane ramp will be restricted to staff parking only;
- It will be assumed to be conservative that all spaces will generate 1 vehicle trip in a single peak hour (highly conservative) resulting in a traffic generation of 44 vehicle trips
- The inbound and outbound distribution from the car park will follow that of typical office development being the following:
    - AM peak hour period – 90% inbound (40), 10% outbound (4);
    - PM peak hour period – 10% inbound (4), 90% outbound (40).

As noted above, staff development traffic is highly tidal as such to determine any sort of queuing that may occur due to the single lane ramp, the probability of a vehicle exiting the Level 1 Basement and entering the Level 1 Basement needs to be determined. Outside this conflict there is no conflict between opposing vehicle streams, such that there would be no vehicle queues.

To determine the conflict of opposing vehicle streams, reference is made to the Poisson Distribution as shown in **Figure 1** below. Which allows the determination of an event occurring over a given time interval or a specified region of space, which in our case is the time it would take a vehicle to travel along the one-way section of ramp.

The **probability distribution of a Poisson random variable** X representing the number of successes occurring in a given time interval or a specified region of space is given by the formula:

$$P(X) = \frac{e^{-\mu}\mu^x}{x!}$$

where

$x = 0, 1, 2, 3 \ldots$

$e = 2.71828$ (but use your calculator's e button)

$\mu =$ mean number of successes in the given time interval or region of space

FIGURE 1: POISSON DISTRIBUTION

The above determination of conflict between opposing vehicle streams has been undertaken based upon the following considerations:

- A distance of 50m between passing opportunities (i.e. the distance where access is restricted to one vehicle);
- Based upon the 50m and a travel speed of 5km/h (highly conservative), the resulting time it takes to travel the 50m distance is 36 seconds;
- Adopting an addition factor of safety of 4 seconds for the light to turn from red to green or vice versa results in a travel time of 40 seconds;
- Inbound traffic of 40 vehicle trips;
- Outbound traffic of 4 vehicle trips.

Adopting the above time of conflict, vehicle trips and direction, the probability of conflict along the 50m length of assessed area is 3.52%. As shown, this is a low chance of conflict between vehicle streams, resulting in one conflict occurring every 28 AM peak hour period. When that conflict does occur, 92% of the time there would only be one vehicle waiting or 8% of the time there would be more than one vehicle waiting for the inbound traffic stream (40 vehicle trips). It should be noted that the 99th percentile queue is two (2) vehicles.

The above would also be the same during the PM peak hour period, but in the reverse direction, i.e. 4 inbound vehicle trips and 40 outbound (98th percentile queue of 2 vehicles when event occurs) vehicle trips.

Overall, the probability of the event occurring is low and the likelihood that there would be two (2) vehicles waiting due to the event would also be extremely rare. Considering this, the operation of the signals is deemed safe which will not have an adverse impact to other users of the car park.

AGD Systems has been approached to provide a functionality report, which is attached within **Annexure B** to this letter. It should be noted that the design of the signal control, including details of loops is something that could have been conditioned. The location of the signal control is **not** located within close proximity to the public road, such that no impacts to external users will result from the use of internal signal control.

> • *The use of traffic counts to determine the traffic generation of the existing development (as oppose to rates from the RMS guide) would be an accurate representation of existing conditions and therefore the net increase in traffic volumes. Passing trade of 80% should be applied to the service station and convenience store component of the existing development.*

MTE Response: The RMS Guide to Traffic Generating Developments is an accepted methodology to determine traffic generation of various land uses and is an appropriate method to estimate the existing and future traffic generation of the site.

At the time the traffic report was prepared, some of the shops at the existing site were not occupied. Hence, it was not possible to accurately capture existing traffic generation of the site through the use of surveys. If further investigation is required into existing development traffic generation, it is recommended that the traffic reports for the existing sites be reviewed to determine the approved traffic generation of the existing sites.

Further, the car parking layouts of the existing sites and access arrangements would likely play a role in development traffic associated with the development, such that the use of surveys to capture existing development traffic is not an appropriate method. That is there is potential that the traffic generation of the existing sites do not all occur at the existing site driveways, but also within the surrounding road network, i.e. visitors to the existing sites may park elsewhere and not solely restricted to on-site.

In regard to passing trade, there is no evidence to suggest that passing trade for service stations is 80%. In the event that 80% passing trade is applied, the resultant comparison traffic generation is shown in **Table 1**, **2** and **3** below.

TABLE 1: FUTURE TRAFFIC GENERATION - RMS

Use	Scale		Generation Rate	Trips
Aged Care	122 units	AM & PM	0.2 per dwelling	25 (1)
Commercial (Shops)	1,540m^2 GLFA	AM	50% of PM rate	43 (2)
		PM	56 per 1000m^2	86 (2)
TOTAL	**-**	**AM**		**68 (26 in, 42 out)**
		PM		**111 (63 in, 48 out)**

Note: (1) Assumes 20% inbound, 80% outbound in the AM peak period. Vice versa in PM peak period.
(2) Assumes 50% inbound, 50% outbound in both AM and PM peak period.

TABLE 2: EXISTING TRAFFIC GENERATION - RMS

Use	Scale	Peak Period	Generation Rate	Trips (2)
Residential	2 x dwelling houses	AM	0.95 per dwelling	2
		PM	0.99 per dwelling	2
	3 x shop top dwellings	AM	0.5 per dwelling	2
		PM	0.5 per dwelling	2
Service Station (Fuel and Mechanic)	1,558m^2 Site Area	AM	Equal to PM rate (1)	(62) 13 (3)
		PM	4 per 100m^2 Site Area (1)	(62) 13 (3)
Service Station (Convenience Store)	160m^2 GFA	AM	Equal to PM rate	24
		PM	30 per 100m^2 GFA	24
Gymnasium (Pilates Studio)	98.6m^2 GFA	AM	50% of PM rate	5
		PM	9 per 100m^2 GFA	9
Retail	522.3m^2 GFA	AM	50% of PM rate	13
		PM	4.6 per 100m^2 GLFA	25
Veterinary Hospital and Grooming	230m^2 GFA	AM	50% of PM rate	3
		PM	2.2 per 100m^2 GLFA	5
TOTAL	**-**	**AM**	**-**	**62 (4) (32 in, 30 out)**
		PM	**-**	**80 (4) (39 in, 41 out)**

Note: (1) A 80% passing trade reduction has been applied.
(2) Trip distribution as follows:
(a) Residential: 20% inbound, 80% outbound during AM peak period. Vice versa for PM.
(b) Service station, gymnasium, retail and veterinary: 50% inbound, 50% outbound during both AM and PM peak periods.
(3) The traffic generation associated with the service station is 62 trips in both the AM and PM peak periods, with 13 trips being new to the road network due to a 80% passing trade factor.
(4) The total does not include passing trade associated with the service station.

TABLE 3: NET CHANGE TRAFFIC GENERATION - RMS

Scenario	Peak Period	Trips	Trip Distribution
Existing(1)	AM	- 62	- 32 in, - 30 out
	PM	- 80	- 39 in, - 41 out
Future(2)	AM	+ 68	+ 26 in, + 42 out
	PM	+ 111	+ 63 in, + 48 out
NET CHANGE	**AM**	**- 12**	**-6 in, +12 out**
	PM	**+ 13**	**+24 in, + 7 out**

The traffic assessment and modelling undertaken to date does not remove any existing traffic generated from the existing development, but rather adds the full proposed development traffic generation of the site. This provides a conservative assessment.

• The traffic report must consider the following future upgrade projects:

1. River Road/Longueville Road upgrade – Modelling is required to be updated as per the TCS provided.

MTE Response: This was completed and provided to Council in the letter dated 14th October 2020 (reference: 200379.02FB). In any event, the assessment is reproduced below for Council assessment.

Modifications have been undertaken to the SIDRA model to reflect the upgraded conditions, specifically the following:

- Removal of the left turn left (high angle) slip lane from River Road West into Longueville Road;
- Addition of a right turn lane from Longueville Road into River Road West;
- Pedestrian signal control over the full length of the approach to the signalised intersection from Longueville Road.

It is relevant to note that the right turn volume from Longueville Road has been left as a single vehicle (1), as this is a new vehicle movement from existing conditions and it is not known the displaced traffic volume that will use this movement compared to existing observed traffic.

The updated SIDRA model is shown in **Table 4** below, with detailed SIDRA outputs reproduced in **Annexure C** for reference. The implemented TCS plan has also been modified to reflect that as shown in **Annexure D** for reference.

It should be noted that both existing and future scenarios have the upgraded road geometry.

TABLE 4: INTERSECTION PERFORMANCE (SIDRA INTERSECTION 9.0)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/veh)	Level of Service[3][4]	Control Type	Worst Movement
EXISTING PERFORMANCE – WITH FUTURE ROAD GEOMETRY						
Longueville Road / Northwood Road / River Road West	AM	0.73	17.4	**B**	Signals	RT from Longueville Road
	PM	0.60	8.6	**A**		RT from Longueville Road
Kenneth Street / Northwood Road	AM	0.45	9.4	**A**	Signals	RT from Kenneth Street
	PM	0.64	13.2	**A**		RT from Kenneth Street
FUTURE PERFORMANCE – WITH FUTURE ROAD GEOMETRY						
Longueville Road / Northwood Road / River Road West	AM	0.73	17.4	**B**	Signals	RT from Longueville Road
	PM	0.62	8.7	**A**		RT from Longueville Road
Kenneth Street / Northwood Road	AM	0.44	9.5	**A**	Signals	RT from Kenneth Street
	PM	0.65	13.7	**B**		RT from Kenneth Street

NOTES:
(1) The Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.
(2) The average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.
(3) The Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.
(4) No overall Level of Service is provided for Give Way and Stop controlled intersections as the low delays associated with the dominant movements skew the average delay of the intersection. The Level of Service of the worst approach is an indicator of the operation of the intersection, with a worse Level of Service corresponding to long delays and reduced safety outcomes for that approach.

As shown above, the assessed signalised intersections of Kenneth Street / Northwood Road and Longueville Road / Northwood Road / River Road West retain an existing Level of Service of “A” or “B” during the both AM and PM peak hour periods. This indicates acceptable delays and additional spare capacity maintained. As such it can be concluded that the proposed development will not have an adverse impact upon the operation of the assessed signalised intersection under future road geometry conditions.

2. Impact on local streets - The Traffic Report does not provide a detailed assessment on the impact of local streets such as Arabella Street/Woodford Street/Kenneth Street. Given the left in left out arrangement, it is noted that 30% and 60% of traffic entering the development in the AM and PM peak hours respectively will be coming from the east via River Road. These vehicles are expected to use Arabella, Woodford and Kenneth Streets. The Consultant is to provide a SIDRA analysis at the above intersections to determine the impact of the additional traffic on these local streets.

MTE Response: It is not sure why it is expected that all vehicles travelling to the site will all use this local road route to enter the site due to the restriction to left in / left out. There are multiple routes to the site that do not rely upon Arabella and Woodford Street. Alternative routes include the following:

- Left turn into Kenneth Street undertaking a U-turn and continuging back to Northwood Road;
- The use of Zeta Road or Richardson Street West;
- The use of William Edward Street.

Notwithstanding the above, additional intersection traffic surveys were conducted at the intersections of Northwood Road / Arabella Street, Arabella Street / Woodford Street and Woodford Street / Kenneth Street from 7:00 AM to 9:00 AM on Thursday 26 November 2020 and 4:00 PM to 6:00 PM on Wednesday 25 November 2020 representing a typical operating weekday. The full survey results are shown in **Annexure E** for reference.

The performance of the subject intersections under existing traffic conditions and future traffic conditions have been assessed using SIDRA Intersection 9.0. The future conditions are the existing conditions plus the associated development traffic as outlined in MTE's *Traffic and Parking Impact Assessment* dated 18th August 2020 (ref: 200379.01FB). The purpose of this assessment is to compare the existing intersection operations to the future scenario under the increased traffic load. The results of the existing and future conditions are shown in shown in **Table 5**, with full results depicted in **Annexure F**.

It is noted that under the future traffic assessment, no traffic associated with the existing uses of the subject site have been subtracted. With the full amount of traffic added as expected to be associated with these intersections under future conditions, this assessment is conservative and provides a worst-case outcome.

TABLE 5: INTERSECTION PERFORMANCE (SIDRA INTERSECTION 9.0)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/veh)	Level of Service[3][4]	Control Type	Worst Movement
EXISTING PERFORMANCE						
Northwood Road / Arabella Street	AM	0.07	2.5 (Worst: 6.3)	**NA** (Worst: A)	Give Way	RT from Arabella Street
	PM	0.09	2.5 (Worst: 6.3)	**NA** (Worst: A)		RT from Arabella Street
Arabella Street / Woodford Street	AM	0.03	2.8 (Worst: 6.1)	**NA** (Worst: A)	Give Way	RT from Woodford Street
	PM	0.03	2.8 (Worst: 6.1)	**NA** (Worst: A)		RT from Woodford Street
Kenneth Street / Woodford Street	AM	0.08	1.5 (Worst: 6.4)	**NA** (Worst: A)	Give Way	RT from Woodford Street
	PM	0.09	1 (Worst: 6.5)	**NA** (Worst: A)		RT from Woodford Street
FUTURE PERFORMANCE						
Northwood Road / Arabella Street	AM	0.07	2.6 (Worst: 6.3)	**NA** (Worst: A)	Give Way	RT from Arabella Street
	PM	0.11	2.9 (Worst: 6.4)	**NA** (Worst: A)		RT from Arabella Street
Arabella Street / Woodford Street	AM	0.04	2.9 (Worst: 6.1)	**NA** (Worst: A)	Give Way	RT from Woodford Street
	PM	0.06	3 (Worst: 6.1)	**NA** (Worst: A)		RT from Woodford Street
Kenneth Street / Woodford Street	AM	0.08	1.6 (Worst: 6.4)	**NA** (Worst: A)	Give Way	RT from Woodford Street
	PM	0.09	1.6 (Worst: 6.6)	**NA** (Worst: A)		RT from Woodford Street

Notes: Refer to **Table 1**.

It can be seen that the three (3) subject intersections currently perform at a high level of efficiency, with a low degree of saturation and low average delay. Under future traffic loads as a result of the proposed development, no noticeable change to the conditions of the occur, with results indicating that there is ample space capacity and low averages delays. To quantify, the largest change in average delay for all intersections is associated with the PM peak hour period operation of the Kenneth Street, Woodford Street intersection, with a change of 0.6 seconds. This is an insignificant amount of time, with a driver not able to notice the change.

It is evident that the proposed development will not impact the conditions of the intersections of Northwood Road / Arabella Street, Arabella Street / Woodford Street and Woodford Street / Kenneth Street during the AM and PM peak hour periods with no tangible changes to intersection operations and as such, is a non-issue.

Furthermore, a residential amenity assessment has been conducted in order to assess the potential impact along the roads of Arabella Street and Woodford Street in terms of residential amenity. The *RMS Guide to Traffic Generating Developments 2002* (RMS Guide), suggests that the environmental goal thresholds for local streets is 200 vehicles per hour and that ideally local streets should not exceed 300 vehicles per hour as a maximum.

A portion of the generated traffic as a result of the proposal are likely to utilise Arabella Street and Woodford Street in order to access the site. The existing and future peak hourly traffic volumes along these roads have been considered, as summarised in **Table 6**.

TABLE 6: RESIDENTIAL AMENITY - PEAK HOUR TRAFFIC FLOWS

Street	Existing (1)(2)		Future (5)	
	AM	PM	AM	PM
Arabella Road (3)	129	134	139	172
Woodford Road (4)	91	58	99	96

Notes (1) Taken from intersection surveys reproduced within **Annexure E**.
(2) Highest two-way traffic flow along subject road in any hour within the survey period. Not necessarily the intersection peak.
(3) AM and PM two-way peak occurs at 7:45am – 845am and 5:00pm - 6:00pm respectively.
(4) AM and PM two-way peak occurs at 7:30am – 8:30am and 5:00pm – 6:00pm respectively.
(5) Future equals existing two-way traffic flow plus traffic generation as determined in **MTE Report** dated 18th August 2020.

As shown in the above table, the two-way peak hour flows under the future scenario remain below the 200 vehicle per hour environmental goal threshold suggested in the RMS Guide in both the AM and PM peak hour periods. Therefore, it is concluded that residential amenity will not be adversely affected by the relatively minor increases in two-way trips. It should be noted that no existing vehicle traffic has been discounted from the above future traffic along these streets, with the actual traffic travelling along these routes likely to be less than the above due to existing development traffic undertaking the same routes.

It is reiterated that the traffic generated by the proposed development will have no noticeable impact to the intersections of Northwood Road / Arabella Street, Arabella Street / Woodford Street and Woodford Street / Kenneth Street during the AM and PM peak hour periods nor will residential amenity be effected.

> *3. Northwood Roundabout – Council is the process of gaining approval for a roundabout at the Northwood Road/River Road intersection. Given the development is restricted to left in/left out access, the proposed roundabout will facilitate westbound movements from the development which will potentially reduce rat-running through local streets. As such, the developer is required to contribute funding towards the construction of the proposed roundabout.*

MTE Response: Contributions are for others to address. The proposed development does not contribute to the need of a roundabout based upon the modelling and residential amenity considerations undertaken to date.

Height clearance

> *• The height clearance proposed is not in accordance with AS2890.2. Ramp sections are to be provided indicating the height clearance for the largest design vehicles accessing the development.*

MTE Response: Long sections are provided within **Annexure A**, indicating a headroom of 3.6m for the entry driveway ramp, 2.6m headroom for the ramp between Level 3 and Level 2 and a headroom of 2.2m for the ramp between Level 2 and Level 1.

> *• AutoCAD files of the ground clearance test is to be provided for a B99 and MRV as the plan provided is unclear.*

MTE Response: This has been addressed within a previous response within this letter.

8) Additional Comments from the Sydney Eastern City Planning Panel

The following additional information, as per the Sydney North Planning Panel briefing on 18/11/2020 (not addressed previously), is to be provided:

> *• A revised traffic analysis to address the cumulative impact of approved/pending developments in the vicinity of the site including the proposed development at 266 Longueville Road.*

MTE Response: It is the view of *M^CLaren Traffic Engineering* (**MTE**) that a cumulative assessment is not the responsibility of the applicant and is an excessive and unnecessary requirement to impose on the applicant.

The *Traffic and Parking Impact Assessment* as prepared by **MTE** dated 18th August 2020, reference 200379.01FB, conducted a traffic generation analysis that assessed the expected traffic impact upon the existing road network assessment within the vicinity of the site. In this, the existing road intersection conditions, as gathered with traffic surveys, of Longueville Road / Northwood Road / River Road West, Kenneth Street / Northwood Road and Longueville Road / Northwood Road / Kenneth Street were analysed using the traffic modelling software package SIDRA INTERSECTION 9.0. Further modelling has been conducted for potential future intersection layouts as presented in this letter.

The expected traffic generation associated with the proposed development of 68 vehicle trips (26 in, 42 out) and 111 vehicle trips (63 in, 48 out) in the AM and PM peak hour periods respectively was added to the existing road conditions in order to compare the existing intersection operations to the future scenario under the increased traffic load. It is noted that no discount in traffic generation was applied to account for the existing uses of the subject site, ensuring a conservative assessment was undertaken. The expected traffic distribution associated with the proposed development is based upon the road network, the *Traffix* planning proposal (dated October 2017, ref:16.326r01v10) and the traffic survey data gathered.

The resultant analysis indicated that the subject intersections in close proximity to the proposed development all retained the same overall Level of Service under the future conditions with minimal delays and additional capacity, indicating that there will be no noticeable impact on the existing road network as a result of the proposed development.

The requirement to provide a cumulative assessment, including developments near the proposed site that have been approved and not yet built, or are pending Council approval, is the responsibility

of Council. Council have been provided with the traffic generation, expected traffic distribution and relevant modelling assumptions (i.e. SIDRA inputs) for the subject development. Using this information for each development, Council are able to undertake a cumulative assessment as part of their approval process to understand the impacts of multiple developments in the subject area.

In order for the cumulative impact assessment to be undertaken the following information is required to be provided free of charge by Council:

a) Electronic SIDRA files;

b) List of developments to be assessment, including locations;

c) Summary of external traffic flows (including traffic assignment) by precise movement (i.e. left, right, through, U-turn) at each affected intersection;

d) Time of which traffic flows occur, including over what years for analysis when these developments are operational.

It is reiterated that it is not the responsibility of the applicant to undertake extensive intersection and traffic network modelling to predict future cumulative impact conditions within the localised road network area by numerous development proposals. It is Councils role in the development approval process to model and assess the proposal in conjunction with any other development proposal that has been approved but not fully constructed or occupied.

Finally, the request to undertake cumulative traffic impact assessment is an unreasonable request for the applicant. All other developments, if requested to be undertaken despite our objection, would be shown as future scenarios beyond the existing plus subject DA scenario.

Please contact Mr Matthew Elyard or the undersigned on 8355 2440 should you require further information or assistance.

Yours faithfully,

M^{c}Laren Traffic Engineering

Matthew M^{C}Carthy
Senior Traffic Engineer
BE Civil Engineering
Masters of Engineering Science
RMS Accredited Level 1 Road Safety Auditor
RMS Accredited Work Zone Traffic Management Plan Designer and Inspector

ANNEXURE A: AMENDED PLANS

(Sheet 1 of 5)

ANNEXURE A: AMENDED PLANS

(Sheet 2 of 5)

ANNEXURE A: AMENDED PLANS

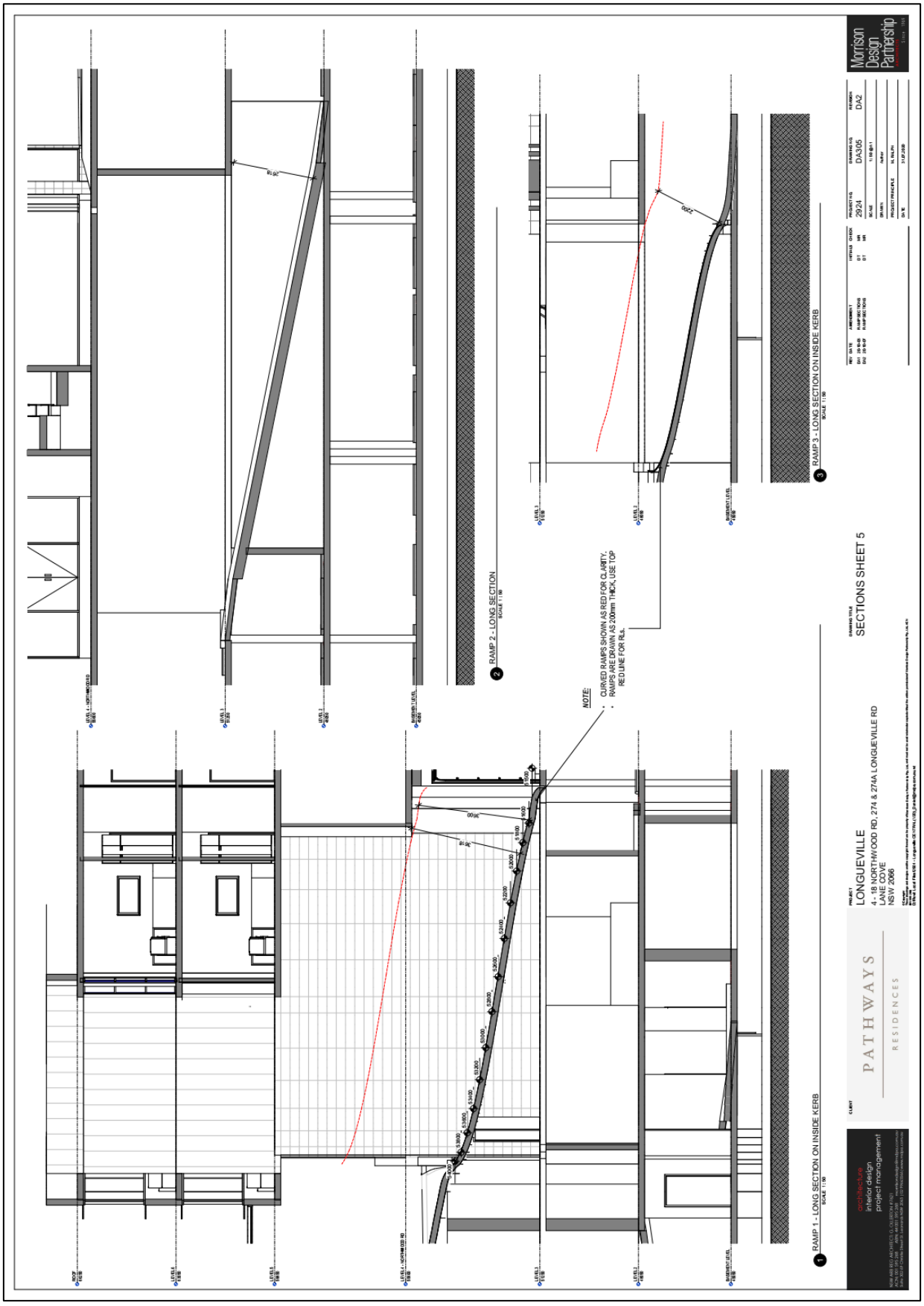
(Sheet 3 of 5)

ANNEXURE A: AMENDED PLANS

(Sheet 4 of 5)

ANNEXURE A: AMENDED PLANS

(Sheet 5 of 5)



Functionality

Ref: 2111
Date: 10th November 2020

To: McLaren Traffic Engineering
7/720 Old Princes Highway.,
Sutherland. NSW 2232

Attention: Mathew McCarthy
E: matt@mclarentraffic.com.au

AGD Systems Pty Ltd
PO Box 817
Kings Langley, NSW 2147

T: (02) 9653 9934
E: Sales@agd-systems.com.au
W: www.agd-systems.com.au

4-18Northwood Road, Lane Cove. NSW

AGD Systems Pty Ltd

Default Phase: Entry lantern 1 displaying *RED*.
Exit lantern 2 displaying *RED*.
Entry/Exit phases available.

Entry Phase: Vehicle enters holding bay and stops under vehicle detector 1, initiating AGDTC.
AGDTC locks out exit phase from basement 2.
AGDTC commences ramp clearance time.
Clearance time completed, AGDTC changes lantern 1 display to *GREEN*.
Vehicle proceeds to access control bollard and stops under directional vehicle detector 3.
After 5seconds AGDTC changes lantern 1 display to *RED*.
Driver activates boom gate via access control system.
Vehicle moves out from under vehicle detector 3.
AGDTC commences ramp clearance time.
Clearance time completed.
AGDTC in *DEFAULT*.

Exit Phase: Vehicle enters holding bay and stops under vehicle detector 2, initiating AGDTC.
AGDTC locks out entry phase from basement 1.
AGDTC commences ramp clearance time.
Clearance time completed, AGDTC changes lantern 2 display to *GREEN*.
After 5seconds AGDTC changes lantern 1 display to *RED*.
AGDTC commences ramp clearance time.
Vehicle activates boom gate via embedded loop in ramp.
Clearance time completed.
AGDTC in *DEFAULT*.

Rogue Entry: Vehicle enters holding bay and stops under vehicle detector 1, initiating AGDTC.
AGDTC locks out exit operation from basement 2.
AGDTC commences ramp clearance time.
Clearance time completed, AGDTC changes lantern 1 display to *GREEN*.
Vehicle proceeds to access control bollard and stops under directional vehicle detector 3.
After 5seconds AGDTC changes lantern 1 display to *RED*.
Vehicle denied entry and reverses out from under directional vehicle detector and vacates.
AGDTC commences ramp clearance time.
Clearance time completed.
AGDTC in *DEFAULT*.

OR

Vehicle proceeds to access control bollard and stops under directional vehicle detector 3.
AGDTC locks out exit phase from basement 2.
Vehicle denied entry and reverses out from under directional vehicle detector and vacates.
AGDTC commences ramp clearance time.
Clearance time completed.
AGDTC in *DEFAULT*.

ANNEXURE B: AGD SYSTEMS REPORT
(SHEET 3 OF 4)

ANNEXURE B: AGD SYSTEMS REPORT
(SHEET 4 OF 4)

CCG MOVEMENT SUMMARY

Common Control Group: CCG1 [1]

Network: N101 [EX AM Signals (Network Folder: General)]

EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (CCG Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance (CCG)

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
Site: 101 [AM - EX - Longueville / Northwood / River Road West]														
South: Northwood Road														
1a	L1	519	0.0	519	0.0	0.388	4.7	LOS A	3.4	23.6	0.21	0.58	0.21	50.0
2	T1	254	0.0	254	0.0	* 0.609	24.0	LOS B	8.2	57.1	1.00	0.90	1.00	34.7
Approach		773	0.0	773	0.0	0.609	11.0	LOS A	8.2	57.1	0.47	0.69	0.47	43.7
North: Longueville Road														
8	T1	183	0.0	183	0.0	0.438	19.8	LOS B	5.0	35.1	0.82	0.69	0.82	36.4
9b	R3	1	0.0	1	0.0	0.005	35.3	LOS C	0.0	0.2	0.89	0.60	0.89	37.2
Approach		184	0.0	184	0.0	0.438	19.9	LOS B	5.0	35.1	0.82	0.69	0.82	36.5
NorthWest: River Road West														
27b	L3	163	0.0	163	0.0	0.731	23.5	LOS B	13.1	91.6	0.82	0.86	0.88	43.3
29a	R1	977	0.0	977	0.0	* 0.731	20.9	LOS B	18.9	132.5	0.85	0.86	0.88	35.6
Approach		1140	0.0	1140	0.0	0.731	21.3	LOS B	18.9	132.5	0.84	0.86	0.88	37.2
All Vehicles		2097	0.0	2097	0.0	0.731	17.4	LOS B	18.9	132.5	0.70	0.78	0.72	39.2
Site: 101 [AM - EX - Northwood / Kenneth]														
SouthEast: Northwood Road														
21	L2	16	0.0	16	0.0	0.445	18.5	LOS B	9.5	66.2	0.70	0.62	0.70	48.4
22	T1	616	0.0	616	0.0	0.445	12.9	LOS A	9.5	66.2	0.70	0.61	0.70	42.2
Approach		632	0.0	632	0.0	0.445	13.0	LOS A	9.5	66.2	0.70	0.61	0.70	42.5
NorthEast: Petrol Station Access														
24	L2	17	0.0	17	0.0	0.029	7.6	LOS A	0.1	1.0	0.32	0.62	0.32	52.0
26	R2	1	0.0	1	0.0	0.029	7.7	LOS A	0.1	1.0	0.32	0.62	0.32	48.0
Approach		18	0.0	18	0.0	0.029	7.6	LOS A	0.1	1.0	0.32	0.62	0.32	51.8
NorthWest: Northwood Road														
27	L2	15	0.0	15	0.0	0.381	8.1	LOS A	7.1	49.9	0.44	0.40	0.44	50.0
28	T1	1024	0.0	1024	0.0	0.381	3.0	LOS A	7.1	49.9	0.28	0.25	0.28	54.9
29	R2	117	0.0	117	0.0	* 0.208	6.0	LOS A	0.7	4.7	0.29	0.61	0.29	48.6
Approach		1156	0.0	1156	0.0	0.381	3.4	LOS A	7.1	49.9	0.28	0.29	0.28	54.1
SouthWest: Kenneth Street														
30	L2	158	0.0	158	0.0	0.248	23.5	LOS B	3.9	27.4	0.76	0.76	0.76	34.1
32	R2	87	0.0	87	0.0	0.366	37.2	LOS C	2.9	20.2	0.95	0.76	0.95	36.6
Approach		245	0.0	245	0.0	0.366	28.4	LOS B	3.9	27.4	0.83	0.76	0.83	35.3
All Vehicles		2051	0.0	2051	0.0	0.445	9.4	LOS A	9.5	66.2	0.48	0.45	0.48	46.8

CCG MOVEMENT SUMMARY

Common Control Group: CCG1 [1] Network: N101 [EX PM Signals (Network Folder: General)]

EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 72 seconds (CCG Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance (CCG)

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
Site: 101 [PM - EX - Longueville / Northwood / River Road West]														
South: Northwood Road														
1a	L1	1131	0.0	1131	0.0	0.600	3.4	LOS A	2.9	20.1	0.11	0.50	0.11	52.1
2	T1	209	0.0	209	0.0	* 0.600	0.9	LOS A	1.8	12.8	0.11	0.37	0.11	55.9
Approach		1340	0.0	1340	0.0	0.600	3.0	LOS A	2.9	20.1	0.11	0.48	0.11	52.7
North: Longueville Road														
8	T1	253	0.0	253	0.0	0.463	20.8	LOS B	7.2	50.1	0.84	0.71	0.84	35.8
9b	R3	1	0.0	1	0.0	0.005	36.4	LOS C	0.0	0.2	0.89	0.60	0.89	36.8
Approach		254	0.0	254	0.0	0.463	20.9	LOS B	7.2	50.1	0.84	0.71	0.84	35.8
NorthWest: River Road West														
27b	L3	74	0.0	74	0.0	0.328	18.0	LOS B	5.5	38.3	0.63	0.75	0.63	46.4
29a	R1	503	0.0	503	0.0	0.328	16.1	LOS B	6.6	46.2	0.63	0.75	0.63	39.2
Approach		577	0.0	577	0.0	0.328	16.3	LOS B	6.6	46.2	0.63	0.75	0.63	40.6
All Vehicles		2171	0.0	2171	0.0	0.600	8.6	LOS A	7.2	50.1	0.33	0.57	0.33	46.4
Site: 101 [PM - EX - Northwood / Kenneth]														
SouthEast: Northwood Road														
21	L2	31	0.0	31	0.0	0.635	20.0	LOS B	16.0	111.7	0.79	0.71	0.79	47.4
22	T1	1206	0.0	1206	0.0	* 0.635	14.3	LOS A	16.0	112.0	0.79	0.71	0.79	41.0
Approach		1237	0.0	1237	0.0	0.635	14.4	LOS A	16.0	112.0	0.79	0.71	0.79	41.2
NorthEast: Petrol Station Access														
24	L2	16	0.0	16	0.0	0.025	8.8	LOS A	0.1	0.9	0.42	0.64	0.42	51.2
26	R2	2	0.0	2	0.0	0.025	8.8	LOS A	0.1	0.9	0.42	0.64	0.42	46.7
Approach		18	0.0	18	0.0	0.025	8.8	LOS A	0.1	0.9	0.42	0.64	0.42	50.9
NorthWest: Northwood Road														
27	L2	14	0.0	14	0.0	0.214	9.7	LOS A	5.6	39.5	0.60	0.53	0.60	48.0
28	T1	577	0.0	577	0.0	0.214	4.7	LOS A	5.6	39.5	0.43	0.38	0.43	52.4
29	R2	160	0.0	160	0.0	* 0.392	14.0	LOS A	3.0	20.8	0.90	0.80	0.90	40.6
Approach		751	0.0	751	0.0	0.392	6.8	LOS A	5.6	39.5	0.53	0.47	0.53	49.3
SouthWest: Kenneth Street														
30	L2	133	0.0	133	0.0	0.214	24.3	LOS B	3.4	23.7	0.76	0.75	0.76	33.6
32	R2	75	0.0	75	0.0	0.322	38.1	LOS C	2.5	17.7	0.95	0.76	0.95	36.3
Approach		207	0.0	207	0.0	0.322	29.3	LOS C	3.4	23.7	0.83	0.75	0.83	35.0
All Vehicles		2213	0.0	2213	0.0	0.635	13.2	LOS A	16.0	112.0	0.70	0.63	0.70	42.8

CCG MOVEMENT SUMMARY

Common Control Group: CCG1 [1]

Network: N101 [FU AM Signals (Network Folder: General)]

EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 72 seconds (CCG Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance (CCG)

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
Site: 101 [AM - FU - Longueville / Northwood / River Road West]														
South: Northwood Road														
1a	L1	527	0.0	527	0.0	0.389	4.6	LOS A	3.4	24.0	0.20	0.58	0.20	50.1
2	T1	258	0.0	258	0.0	* 0.631	25.3	LOS C	8.2	57.1	1.00	0.92	1.01	33.9
Approach		785	0.0	785	0.0	0.631	11.4	LOS B	8.2	57.1	0.46	0.69	0.47	43.3
North: Longueville Road														
8	T1	186	0.0	186	0.0	0.480	21.3	LOS C	5.4	37.8	0.84	0.71	0.84	35.4
9b	R3	1	0.0	1	0.0	0.005	36.4	LOS D	0.0	0.2	0.89	0.60	0.89	36.8
Approach		187	0.0	187	0.0	0.480	21.4	LOS C	5.4	37.8	0.84	0.71	0.84	35.4
NorthWest: River Road West														
27b	L3	163	0.0	163	0.0	0.729	23.2	LOS C	13.1	91.6	0.81	0.86	0.87	43.5
29a	R1	991	0.0	991	0.0	* 0.729	20.4	LOS C	19.5	136.4	0.84	0.85	0.86	35.9
Approach		1154	0.0	1154	0.0	0.729	20.8	LOS C	19.5	136.4	0.83	0.85	0.86	37.5
All Vehicles		2126	0.0	2126	0.0	0.729	17.4	LOS B	19.5	136.4	0.70	0.78	0.71	39.2
Site: 101 [AM - FU - Northwood / Kenneth]														
SouthEast: Northwood Road														
21	L2	16	0.0	16	0.0	0.442	18.2	LOS B	9.7	67.9	0.69	0.61	0.69	48.6
22	T1	629	0.0	629	0.0	0.442	12.6	LOS B	9.7	67.9	0.69	0.60	0.69	42.5
Approach		645	0.0	645	0.0	0.442	12.7	LOS B	9.7	67.9	0.69	0.60	0.69	42.8
NorthWest: Northwood Road														
28	T1	1056	0.0	1056	0.0	0.382	2.9	LOS A	7.4	51.5	0.27	0.24	0.27	55.2
29	R2	117	0.0	117	0.0	* 0.209	7.0	LOS A	0.8	5.3	0.33	0.63	0.33	47.5
Approach		1173	0.0	1173	0.0	0.382	3.3	LOS A	7.4	51.5	0.28	0.28	0.28	54.4
SouthWest: Kenneth Street														
30	L2	158	0.0	158	0.0	0.255	24.6	LOS C	4.1	28.6	0.77	0.76	0.77	33.4
32	R2	98	0.0	98	0.0	0.422	38.7	LOS D	3.4	23.5	0.97	0.77	0.97	36.1
Approach		256	0.0	256	0.0	0.422	30.0	LOS C	4.1	28.6	0.84	0.76	0.84	34.8
All Vehicles		2074	0.0	2074	0.0	0.442	9.5	LOS A	9.7	67.9	0.48	0.44	0.48	46.6

CCG MOVEMENT SUMMARY

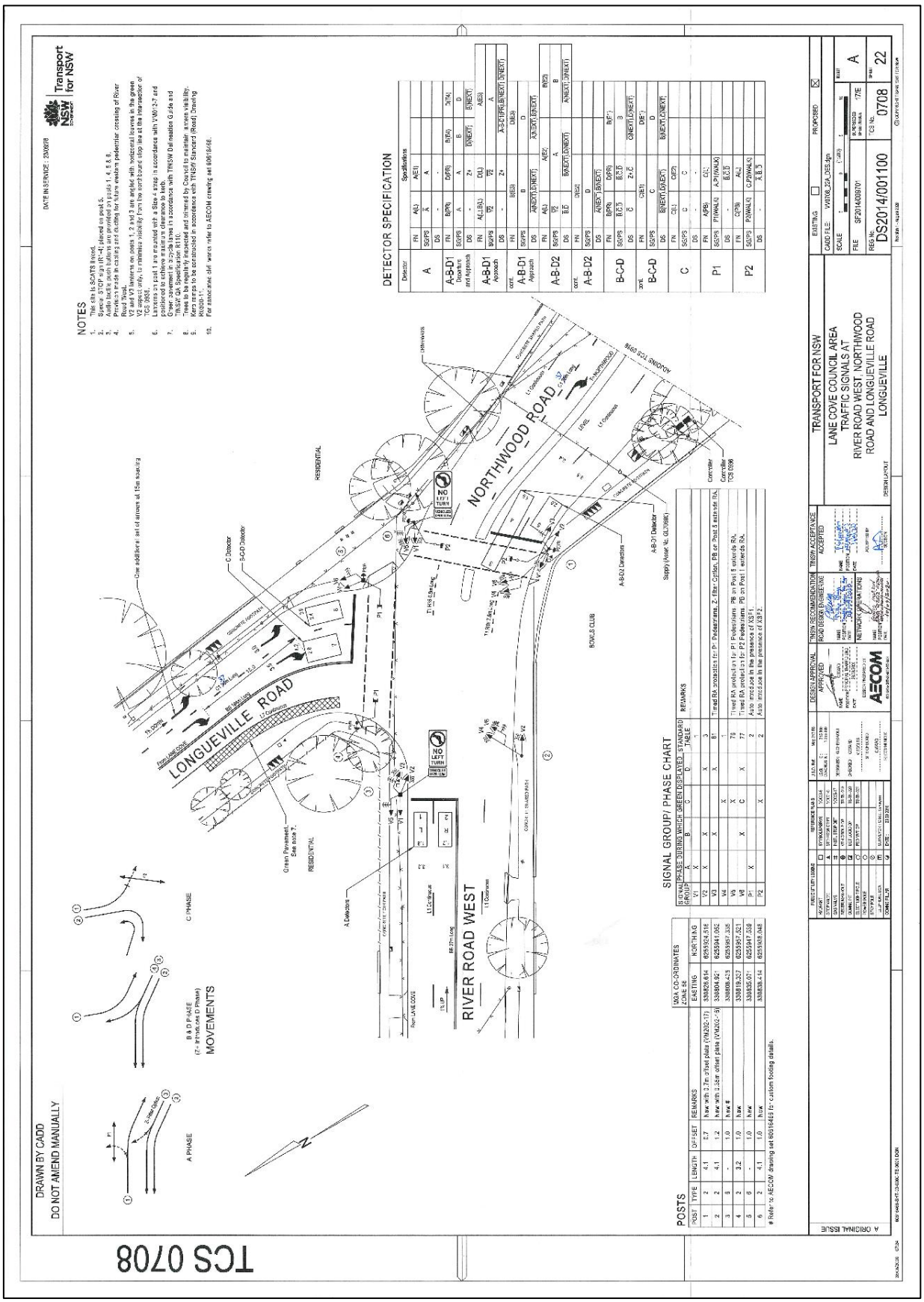
Common Control Group: CCG1 [1] Network: N101 [FU PM Signals (Network Folder: General)]

EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 72 seconds (CCG Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance (CCG)

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
Site: 101 [PM - FU - Longueville / Northwood / River Road West]														
South: Northwood Road														
1a	L1	1156	0.0	1156	0.0	0.616	3.4	LOS A	3.0	21.0	0.11	0.50	0.11	52.1
2	T1	215	0.0	215	0.0	* 0.616	0.9	LOS A	1.9	13.2	0.12	0.37	0.12	56.0
Approach		1371	0.0	1371	0.0	0.616	3.0	LOS A	3.0	21.0	0.11	0.48	0.11	52.7
North: Longueville Road														
8	T1	259	0.0	259	0.0	0.487	21.1	LOS C	7.4	51.9	0.85	0.71	0.85	35.6
9b	R3	1	0.0	1	0.0	0.005	36.4	LOS D	0.0	0.2	0.89	0.60	0.89	36.8
Approach		260	0.0	260	0.0	0.487	21.1	LOS C	7.4	51.9	0.85	0.71	0.85	35.6
NorthWest: River Road West														
27b	L3	74	0.0	74	0.0	0.339	18.0	LOS B	5.6	39.1	0.63	0.75	0.63	46.4
29a	R1	517	0.0	517	0.0	0.339	16.2	LOS B	6.9	48.0	0.64	0.75	0.64	39.1
Approach		591	0.0	591	0.0	0.339	16.4	LOS B	6.9	48.0	0.64	0.75	0.64	40.5
All Vehicles		2221	0.0	2221	0.0	0.616	8.7	LOS A	7.4	51.9	0.34	0.58	0.34	46.4
Site: 101 [PM - FU - Northwood / Kenneth]														
SouthEast: Northwood Road														
21	L2	31	0.0	31	0.0	0.651	20.2	LOS C	16.6	115.9	0.80	0.72	0.80	47.3
22	T1	1237	0.0	1237	0.0	* 0.651	14.4	LOS B	16.6	116.1	0.80	0.71	0.80	40.8
Approach		1267	0.0	1267	0.0	0.651	14.6	LOS B	16.6	116.1	0.80	0.71	0.80	41.1
NorthWest: Northwood Road														
28	T1	613	0.0	613	0.0	0.222	4.5	LOS A	5.8	40.5	0.42	0.37	0.42	52.8
29	R2	160	0.0	160	0.0	* 0.397	14.5	LOS B	3.1	21.5	0.91	0.80	0.91	40.3
Approach		773	0.0	773	0.0	0.397	6.6	LOS A	5.8	40.5	0.53	0.46	0.53	49.6
SouthWest: Kenneth Street														
30	L2	133	0.0	133	0.0	0.214	24.3	LOS C	3.4	23.7	0.76	0.75	0.76	33.6
32	R2	121	0.0	121	0.0	0.521	39.2	LOS D	4.2	29.5	0.98	0.78	0.98	35.9
Approach		254	0.0	254	0.0	0.521	31.4	LOS C	4.2	29.5	0.86	0.77	0.86	35.1
All Vehicles		2294	0.0	2294	0.0	0.651	13.7	LOS B	16.6	116.1	0.71	0.63	0.71	42.4

ANNEXURE D: TCS PLAN AS PROVIDED BY COUNCIL



ANNEXURE E: ADDITIONAL TRAFFIC SURVEYS
(SHEET 1 OF 3)

Curtis Traffic Surveys	Turning movement count							
Job:	201108mcl (20_0379)				Peak Hour Volumes	Kenneth St 107	37	Wood
Day, date	26/11/20							33
Location:	Kenneth St & Woodford St							5
Weather:	Fine					136	6	
Client:	McLaren Traffic Engineering							
	From Kenneth St south		From Woodford St		From Kenneth St north			
Time Period	through	right	left	right	left	through	Total vehicles	Peak
07:00 to 07:15	25	0	2	12	9	42	90	peak
07:15 to 07:30	27	0	2	6	5	32	72	
07:30 to 07:45	25	1	3	7	8	30	74	
07:45 to 08:00	23	1	2	12	10	26	74	
08:00 to 08:15	32	2	1	9	9	29	82	
08:15 to 08:30	30	1	3	8	8	30	80	
08:30 to 08:45	34	2	1	7	6	24	74	
08:45 to 09:00	40	1	0	9	14	24	88	
Total	236	8	14	70	69	237		

Curtis Traffic Surveys	Turning movement count							
Job:	201108mcl (20_0379)				Peak Hour Volumes	Kenneth St 163	17	Woodfo
Day, date	25/11/20							27
Location:	Kenneth St & Woodford Rd							8
Weather:	Fine					121	5	
Client:	McLaren Traffic Engineering							
	From Kenneth St south		From Woodford St		From Kenneth St north			
Time Period	through	right	left	right	left	through	Total vehicles	Peak
16:00 to 16:15	29	2	1	7	4	51	94	peak
16:15 to 16:30	35	0	2	6	4	46	93	
16:30 to 16:45	27	1	2	11	8	27	76	
16:45 to 17:00	30	2	3	3	1	39	78	
17:00 to 17:15	29	1	4	5	3	41	83	
17:15 to 17:30	32	1	4	3	3	43	86	
17:30 to 17:45	27	1	2	9	7	41	87	
17:45 to 18:00	28	2	3	4	4	38	79	
Total	237	10	21	48	34	326		

ANNEXURE E: ADDITIONAL TRAFFIC SURVEYS
(SHEET 2 OF 3)

Curtis Traffic Surveys						Peak Hour		7	49	7				
	Turning movement count						7				8			
Job:	201108mcl (20_0379)						10				23			
Day, date	26/11/20						17				2			
Location:	Woodford Rd & Arabella St							20	44	1				
Weather:	Fine													
Client:	McLaren Traffic Engineering													
	All motor vehicles													
	From Arabella St north			From Woodford Rd west			From Arabella St south			From Woodford Rd east				
Time Period	left	through	right	left	through	right	left	through	right	left	through	right	Total vehicle movements	
07:00 to 07:15	4	13	1	1	4	4	5	3	1	0	8	3	47	
07:15 to 07:30	2	14	1	0	1	4	4	8	0	0	3	2	39	
07:30 to 07:45	1	11	2	3	2	4	6	18	0	1	5	1	54	
07:45 to 08:00	0	11	3	3	3	5	5	15	0	1	7	2	55	
08:00 to 08:15	2	8	4	4	4	3	1	6	0	0	6	2	40	
08:15 to 08:30	1	6	4	3	2	4	4	11	1	1	4	3	44	
08:30 to 08:45	3	15	3	4	1	3	3	13	1	1	3	2	52	
08:45 to 09:00	2	11	2	4	3	7	2	10	0	0	3	4	48	
Totals	15	89	20	22	20	34	30	84	3	4	39	19		

Curtis Traffic Surveys						Peak Hour		9	89	8				
	Turning movement count						5				3			
Job:	201108mcl (20_0379)						7				12			
Day, date	25/11/20						8				2			
Location:	Woodford Rd & Arabella St							17	23	3				
Weather:	Fine													
Client:	McLaren Traffic Engineering													
	All motor vehicles													
	From Arabella St north			From Woodford Rd west			From Arabella St south			From Woodford Rd east				
Time Period	left	through	right	left	through	right	left	through	right	left	through	right	Total vehicle movements	
16:00 to 16:15	2	17	1	3	2	1	4	3	0	0	3	2	38	
16:15 to 16:30	3	14	2	2	1	0	3	3	1	1	2	0	32	
16:30 to 16:45	4	11	3	2	3	1	6	8	0	0	3	1	42	
16:45 to 17:00	2	22	1	1	0	2	3	4	0	0	2	1	38	
17:00 to 17:15	1	19	3	2	1	1	4	6	1	1	3	1	43	
17:15 to 17:30	0	26	2	0	1	2	4	6	1	0	4	2	48	
17:30 to 17:45	4	20	3	2	2	3	5	4	1	1	3	0	48	
17:45 to 18:00	3	24	1	1	3	2	4	7	0	0	2	0	47	
Totals	19	153	16	13	13	12	33	41	4	3	22	7		

ANNEXURE E: ADDITIONAL TRAFFIC SURVEYS
(SHEET 3 OF 3)

Curtis Traffic Surveys	Turning movement count								Northwoo
Job:	201108mcl (20_0379)				Peak Hour Volumes	59			109
Day, date	26/11/20					50			13
Location:	Northwood Rd & Arabella St						53	13	
Weather:	Fine						Arabella		
Client:	McLaren Traffic Engineering								
	From Northwood Rd west		From Arabella St		From Northwood Rd east				
Time Period	through	right	left	right	left	through	vehicles	Peak	
07:00 to 07:15	11	14	7	1	2	20	55		
07:15 to 07:30	13	13	9	1	4	30	70		
07:30 to 07:45	14	6	17	5	8	19	69		
07:45 to 08:00	13	12	17	2	2	22	68		
08:00 to 08:15	14	11	9	3	4	31	72		
08:15 to 08:30	11	10	12	1	2	25	61		
08:30 to 08:45	21	17	15	7	5	31	96	peak	
08:45 to 09:00	18	12	13	4	4	27	78		
Total	115	95	99	24	31	205			

Curtis Traffic Surveys	Turning movement count								Northwood
Job:	201108mcl (20_0379)				Peak Hour Volumes	88			67
Day, date	25/11/20					74			13
Location:	Northwood Rd & Arabella St						21	9	
Weather:	Fine						Arabella		
Client:	McLaren Traffic Engineering								
	From Northwood Rd west		From Arabella St		From Northwood Rd east				
Time Period	through	right	left	right	left	through	vehicles	Peak	
16:00 to 16:15	16	17	5	3	7	14	62		
16:15 to 16:30	20	14	4	1	4	17	60		
16:30 to 16:45	21	16	8	2	2	15	64		
16:45 to 17:00	31	27	4	3	0	21	86	peak	
17:00 to 17:15	15	17	6	4	5	9	56		
17:15 to 17:30	16	22	5	3	3	10	59		
17:30 to 17:45	14	25	5	2	1	9	56		
17:45 to 18:00	13	24	6	3	3	7	56		
Total	146	162	43	21	25	102			

MOVEMENT SUMMARY

Site: 101 [EX AM - Northwood Road / Arabella Street (Site Folder: General)]

Giveway controlled intersection of Northwood Road and Arabella Street
AM Peak Hour Period Existing Conditions
Site Category: (None) Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Northwood Road (S)														
1	L2	15	0.0	15	0.0	0.067	5.6	LOS A	0.0	0.0	0.00	0.07	0.00	57.7
2	T1	114	0.0	114	0.0	0.067	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	59.3
Approach		129	0.0	129	0.0	0.067	0.7	NA	0.0	0.0	0.00	0.07	0.00	59.2
North: Northwood Road (N)														
8	T1	64	0.0	64	0.0	0.065	0.3	LOS A	0.3	1.9	0.19	0.25	0.19	57.0
9	R2	50	0.0	50	0.0	0.065	5.8	LOS A	0.3	1.9	0.19	0.25	0.19	55.0
Approach		114	0.0	114	0.0	0.065	2.7	NA	0.3	1.9	0.19	0.25	0.19	56.1
West: Arabella Street (W)														
10	L2	49	0.0	49	0.0	0.047	5.9	LOS A	0.2	1.2	0.21	0.56	0.21	53.0
12	R2	15	0.0	15	0.0	0.047	6.3	LOS A	0.2	1.2	0.21	0.56	0.21	52.5
Approach		64	0.0	64	0.0	0.047	6.0	LOS A	0.2	1.2	0.21	0.56	0.21	52.9
All Vehicles		307	0.0	307	0.0	0.067	2.5	NA	0.3	1.9	0.12	0.24	0.12	56.6

MOVEMENT SUMMARY

Site: 101 [EX PM - Northwood Road / Arabella Street (Site Folder: General)]

Giveway controlled intersection of Northwood Road and Arabella Street
PM Peak Hour Period Existing Conditions
Site Category: (None) Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Northwood Road (S)														
1	L2	13	0.0	13	0.0	0.041	5.5	LOS A	0.0	0.0	0.00	0.10	0.00	57.5
2	T1	67	0.0	67	0.0	0.041	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	59.1
Approach		80	0.0	80	0.0	0.041	0.9	NA	0.0	0.0	0.00	0.10	0.00	58.8
North: Northwood Road (N)														
8	T1	88	0.0	88	0.0	0.090	0.2	LOS A	0.4	2.7	0.15	0.26	0.15	57.1
9	R2	74	0.0	74	0.0	0.090	5.7	LOS A	0.4	2.7	0.15	0.26	0.15	55.0
Approach		162	0.0	162	0.0	0.090	2.7	NA	0.4	2.7	0.15	0.26	0.15	56.1
West: Arabella Street (W)														
10	L2	21	0.0	21	0.0	0.022	5.7	LOS A	0.1	0.6	0.15	0.55	0.15	53.2
12	R2	9	0.0	9	0.0	0.022	6.3	LOS A	0.1	0.6	0.15	0.55	0.15	52.7
Approach		30	0.0	30	0.0	0.022	5.9	LOS A	0.1	0.6	0.15	0.55	0.15	53.0
All Vehicles		272	0.0	272	0.0	0.090	2.5	NA	0.4	2.7	0.11	0.25	0.11	56.5

MOVEMENT SUMMARY

Site: 101 [EX AM - Arabella Street / Woodford Street (Site Folder: General)]

Give way controlled intersection of Arabella Street and Woodford Street
AM Peak Hour Period
Existing Conditions
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Woodford Street (S)														
1	L2	2	0.0	2	0.0	0.029	5.7	LOS A	0.1	0.7	0.20	0.53	0.20	53.8
2	T1	23	0.0	23	0.0	0.029	4.6	LOS A	0.1	0.7	0.20	0.53	0.20	54.0
3	R2	8	0.0	8	0.0	0.029	6.0	LOS A	0.1	0.7	0.20	0.53	0.20	53.3
Approach		33	0.0	33	0.0	0.029	5.0	LOS A	0.1	0.7	0.20	0.53	0.20	53.8
East: Arabella Street (E)														
4	L2	7	0.0	7	0.0	0.033	5.6	LOS A	0.1	0.4	0.05	0.13	0.05	57.1
5	T1	49	0.0	49	0.0	0.033	0.0	LOS A	0.1	0.4	0.05	0.13	0.05	58.6
6	R2	7	0.0	7	0.0	0.033	5.6	LOS A	0.1	0.4	0.05	0.13	0.05	56.5
Approach		63	0.0	63	0.0	0.033	1.3	NA	0.1	0.4	0.05	0.13	0.05	58.2
North: Woodford Street (N)														
7	L2	7	0.0	7	0.0	0.030	5.7	LOS A	0.1	0.7	0.17	0.55	0.17	53.5
8	T1	10	0.0	10	0.0	0.030	4.6	LOS A	0.1	0.7	0.17	0.55	0.17	53.6
9	R2	17	0.0	17	0.0	0.030	6.1	LOS A	0.1	0.7	0.17	0.55	0.17	52.9
Approach		34	0.0	34	0.0	0.030	5.5	LOS A	0.1	0.7	0.17	0.55	0.17	53.3
West: Arabella Street (W)														
10	L2	20	0.0	20	0.0	0.034	5.5	LOS A	0.0	0.1	0.01	0.19	0.01	56.7
11	T1	44	0.0	44	0.0	0.034	0.0	LOS A	0.0	0.1	0.01	0.19	0.01	58.3
12	R2	1	0.0	1	0.0	0.034	5.6	LOS A	0.0	0.1	0.01	0.19	0.01	56.1
Approach		65	0.0	65	0.0	0.034	1.8	NA	0.0	0.1	0.01	0.19	0.01	57.7
All Vehicles		195	0.0	195	0.0	0.034	2.8	NA	0.1	0.7	0.08	0.29	0.08	56.4

MOVEMENT SUMMARY

Site: 101 [EX PM - Arabella Street / Woodford Street (Site Folder: General)]

Give way controlled intersection of Arabella Street and Woodford Street
PM Peak Hour Period
Existing Conditions
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Woodford Street (S)														
1	L2	2	0.0	2	0.0	0.015	5.8	LOS A	0.1	0.4	0.21	0.52	0.21	53.8
2	T1	12	0.0	12	0.0	0.015	4.6	LOS A	0.1	0.4	0.21	0.52	0.21	54.0
3	R2	3	0.0	3	0.0	0.015	6.0	LOS A	0.1	0.4	0.21	0.52	0.21	53.3
Approach		17	0.0	17	0.0	0.015	5.0	LOS A	0.1	0.4	0.21	0.52	0.21	53.8
East: Arabella Street (E)														
4	L2	8	0.0	8	0.0	0.050	5.6	LOS A	0.1	0.5	0.03	0.10	0.03	57.3
5	T1	79	0.0	79	0.0	0.050	0.0	LOS A	0.1	0.5	0.03	0.10	0.03	58.9
6	R2	9	0.0	9	0.0	0.050	5.6	LOS A	0.1	0.5	0.03	0.10	0.03	56.7
Approach		96	0.0	96	0.0	0.050	1.0	NA	0.1	0.5	0.03	0.10	0.03	58.6
North: Woodford Street (N)														
7	L2	5	0.0	5	0.0	0.017	5.6	LOS A	0.1	0.4	0.11	0.55	0.11	53.7
8	T1	7	0.0	7	0.0	0.017	4.6	LOS A	0.1	0.4	0.11	0.55	0.11	53.8
9	R2	8	0.0	8	0.0	0.017	6.0	LOS A	0.1	0.4	0.11	0.55	0.11	53.2
Approach		20	0.0	20	0.0	0.017	5.4	LOS A	0.1	0.4	0.11	0.55	0.11	53.5
West: Arabella Street (W)														
10	L2	17	0.0	17	0.0	0.023	5.6	LOS A	0.0	0.2	0.04	0.27	0.04	55.9
11	T1	23	0.0	23	0.0	0.023	0.0	LOS A	0.0	0.2	0.04	0.27	0.04	57.4
12	R2	3	0.0	3	0.0	0.023	5.7	LOS A	0.0	0.2	0.04	0.27	0.04	55.3
Approach		43	0.0	43	0.0	0.023	2.6	NA	0.0	0.2	0.04	0.27	0.04	56.7
All Vehicles		176	0.0	176	0.0	0.050	2.3	NA	0.1	0.5	0.06	0.24	0.06	57.0

MOVEMENT SUMMARY

Site: 101 [EX AM - Kenneth Street / Woodford Street (Site Folder: General)]

Priority controlled intersection of Kenneth Street and Woodford Street
AM Peak Hour Period Existing Conditions
Site Category: (None) Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kenneth Street (S)														
2	T1	136	0.0	136	0.0	0.074	0.0	LOS A	0.0	0.3	0.03	0.03	0.03	59.7
3	R2	6	0.0	6	0.0	0.074	5.9	LOS A	0.0	0.3	0.03	0.03	0.03	57.4
Approach		142	0.0	142	0.0	0.074	0.3	NA	0.0	0.3	0.03	0.03	0.03	59.6
East: Woodford Street (E)														
4	L2	5	0.0	5	0.0	0.036	5.8	LOS A	0.1	0.8	0.27	0.60	0.27	52.9
6	R2	33	0.0	33	0.0	0.036	6.4	LOS A	0.1	0.8	0.27	0.60	0.27	52.4
Approach		38	0.0	38	0.0	0.036	6.3	LOS A	0.1	0.8	0.27	0.60	0.27	52.4
North: Kenneth Street (N)														
7	L2	37	0.0	37	0.0	0.075	5.6	LOS A	0.0	0.0	0.00	0.15	0.00	57.0
8	T1	107	0.0	107	0.0	0.075	0.0	LOS A	0.0	0.0	0.00	0.15	0.00	58.6
Approach		144	0.0	144	0.0	0.075	1.4	NA	0.0	0.0	0.00	0.15	0.00	58.2
All Vehicles		324	0.0	324	0.0	0.075	1.5	NA	0.1	0.8	0.04	0.15	0.04	58.0

MOVEMENT SUMMARY

Site: 101 [EX PM - Kenneth Street / Woodford Street (Site Folder: General)]

Priority controlled intersection of Kenneth Street and Woodford Street
PM Peak Hour Period Existing Conditions
Site Category: (None) Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kenneth Street (S)														
2	T1	121	0.0	121	0.0	0.065	0.0	LOS A	0.0	0.2	0.03	0.02	0.03	59.7
3	R2	5	0.0	5	0.0	0.065	6.0	LOS A	0.0	0.2	0.03	0.02	0.03	57.4
Approach		126	0.0	126	0.0	0.065	0.3	NA	0.0	0.2	0.03	0.02	0.03	59.6
East: Woodford Street (E)														
4	L2	8	0.0	8	0.0	0.033	6.0	LOS A	0.1	0.8	0.29	0.60	0.29	52.8
6	R2	27	0.0	27	0.0	0.033	6.5	LOS A	0.1	0.8	0.29	0.60	0.29	52.3
Approach		35	0.0	35	0.0	0.033	6.4	LOS A	0.1	0.8	0.29	0.60	0.29	52.4
North: Kenneth Street (N)														
7	L2	17	0.0	17	0.0	0.093	5.6	LOS A	0.0	0.0	0.00	0.06	0.00	57.8
8	T1	163	0.0	163	0.0	0.093	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	59.4
Approach		180	0.0	180	0.0	0.093	0.5	NA	0.0	0.0	0.00	0.06	0.00	59.3
All Vehicles		341	0.0	341	0.0	0.093	1.0	NA	0.1	0.8	0.04	0.10	0.04	58.6

MOVEMENT SUMMARY

Site: 101 [FU AM - Northwood Road / Arabella Street (Site Folder: General)]

Giveway controlled intersection of Northwood Road and Arabella Street
AM Peak Hour Period Future Conditions
Site Category: (None) Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Northwood Road (S)														
1	L2	15	0.0	15	0.0	0.067	5.6	LOS A	0.0	0.0	0.00	0.07	0.00	57.7
2	T1	114	0.0	114	0.0	0.067	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	59.3
Approach		129	0.0	129	0.0	0.067	0.7	NA	0.0	0.0	0.00	0.07	0.00	59.2
North: Northwood Road (N)														
8	T1	64	0.0	64	0.0	0.070	0.3	LOS A	0.3	2.1	0.20	0.27	0.20	56.8
9	R2	58	0.0	58	0.0	0.070	5.8	LOS A	0.3	2.1	0.20	0.27	0.20	54.8
Approach		122	0.0	122	0.0	0.070	2.9	NA	0.3	2.1	0.20	0.27	0.20	55.8
West: Arabella Street (W)														
10	L2	49	0.0	49	0.0	0.047	5.9	LOS A	0.2	1.3	0.21	0.56	0.21	53.0
12	R2	15	0.0	15	0.0	0.047	6.3	LOS A	0.2	1.3	0.21	0.56	0.21	52.5
Approach		64	0.0	64	0.0	0.047	6.0	LOS A	0.2	1.3	0.21	0.56	0.21	52.9
All Vehicles		315	0.0	315	0.0	0.070	2.6	NA	0.3	2.1	0.12	0.25	0.12	56.5

MOVEMENT SUMMARY

Site: 101 [FU PM - Northwood Road / Arabella Street (Site Folder: General)]

Giveway controlled intersection of Northwood Road and Arabella Street
PM Peak Hour Period Future Conditions
Site Category: (None) Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Northwood Road (S)														
1	L2	13	0.0	13	0.0	0.041	5.5	LOS A	0.0	0.0	0.00	0.10	0.00	57.5
2	T1	67	0.0	67	0.0	0.041	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	59.1
Approach		80	0.0	80	0.0	0.041	0.9	NA	0.0	0.0	0.00	0.10	0.00	58.8
North: Northwood Road (N)														
8	T1	88	0.0	88	0.0	0.113	0.2	LOS A	0.5	3.7	0.17	0.32	0.17	56.5
9	R2	112	0.0	112	0.0	0.113	5.7	LOS A	0.5	3.7	0.17	0.32	0.17	54.5
Approach		200	0.0	200	0.0	0.113	3.3	NA	0.5	3.7	0.17	0.32	0.17	55.4
West: Arabella Street (W)														
10	L2	21	0.0	21	0.0	0.022	5.7	LOS A	0.1	0.6	0.14	0.56	0.14	53.2
12	R2	9	0.0	9	0.0	0.022	6.4	LOS A	0.1	0.6	0.14	0.56	0.14	52.7
Approach		30	0.0	30	0.0	0.022	5.9	LOS A	0.1	0.6	0.14	0.56	0.14	53.0
All Vehicles		310	0.0	310	0.0	0.113	2.9	NA	0.5	3.7	0.13	0.29	0.13	56.0

MOVEMENT SUMMARY

Site: 101 [FU AM - Arabella Street / Woodford Street (Site Folder: General)]

Give way controlled intersection of Arabella Street and Woodford Street
AM Peak Hour Period
Future Conditions
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Woodford Street (S)														
1	L2	2	0.0	2	0.0	0.029	5.7	LOS A	0.1	0.7	0.20	0.53	0.20	53.8
2	T1	23	0.0	23	0.0	0.029	4.6	LOS A	0.1	0.7	0.20	0.53	0.20	54.0
3	R2	8	0.0	8	0.0	0.029	6.0	LOS A	0.1	0.7	0.20	0.53	0.20	53.3
Approach		33	0.0	33	0.0	0.029	5.0	LOS A	0.1	0.7	0.20	0.53	0.20	53.8
East: Arabella Street (E)														
4	L2	7	0.0	7	0.0	0.033	5.6	LOS A	0.1	0.4	0.05	0.13	0.05	57.1
5	T1	49	0.0	49	0.0	0.033	0.0	LOS A	0.1	0.4	0.05	0.13	0.05	58.6
6	R2	7	0.0	7	0.0	0.033	5.6	LOS A	0.1	0.4	0.05	0.13	0.05	56.5
Approach		63	0.0	63	0.0	0.033	1.3	NA	0.1	0.4	0.05	0.13	0.05	58.2
North: Woodford Street (N)														
7	L2	7	0.0	7	0.0	0.038	5.7	LOS A	0.1	0.9	0.18	0.56	0.18	53.4
8	T1	10	0.0	10	0.0	0.038	4.6	LOS A	0.1	0.9	0.18	0.56	0.18	53.6
9	R2	25	0.0	25	0.0	0.038	6.1	LOS A	0.1	0.9	0.18	0.56	0.18	52.9
Approach		42	0.0	42	0.0	0.038	5.6	LOS A	0.1	0.9	0.18	0.56	0.18	53.1
West: Arabella Street (W)														
10	L2	20	0.0	20	0.0	0.034	5.5	LOS A	0.0	0.1	0.01	0.19	0.01	56.7
11	T1	44	0.0	44	0.0	0.034	0.0	LOS A	0.0	0.1	0.01	0.19	0.01	58.3
12	R2	1	0.0	1	0.0	0.034	5.6	LOS A	0.0	0.1	0.01	0.19	0.01	56.1
Approach		65	0.0	65	0.0	0.034	1.8	NA	0.0	0.1	0.01	0.19	0.01	57.7
All Vehicles		203	0.0	203	0.0	0.038	2.9	NA	0.1	0.9	0.09	0.30	0.09	56.2

MOVEMENT SUMMARY

Site: 101 [FU PM - Arabella Street / Woodford Street (Site Folder: General)]

Give way controlled intersection of Arabella Street and Woodford Street
PM Peak Hour Period
Future Conditions
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Woodford Street (S)														
1	L2	2	0.0	2	0.0	0.015	5.8	LOS A	0.1	0.4	0.21	0.52	0.21	53.8
2	T1	12	0.0	12	0.0	0.015	4.6	LOS A	0.1	0.4	0.21	0.52	0.21	54.0
3	R2	3	0.0	3	0.0	0.015	6.0	LOS A	0.1	0.4	0.21	0.52	0.21	53.3
Approach		17	0.0	17	0.0	0.015	5.0	LOS A	0.1	0.4	0.21	0.52	0.21	53.8
East: Arabella Street (E)														
4	L2	8	0.0	8	0.0	0.050	5.6	LOS A	0.1	0.5	0.03	0.10	0.03	57.3
5	T1	79	0.0	79	0.0	0.050	0.0	LOS A	0.1	0.5	0.03	0.10	0.03	58.9
6	R2	9	0.0	9	0.0	0.050	5.6	LOS A	0.1	0.5	0.03	0.10	0.03	56.7
Approach		96	0.0	96	0.0	0.050	1.0	NA	0.1	0.5	0.03	0.10	0.03	58.6
North: Woodford Street (N)														
7	L2	5	0.0	5	0.0	0.056	5.6	LOS A	0.2	1.3	0.17	0.57	0.17	53.3
8	T1	7	0.0	7	0.0	0.056	4.6	LOS A	0.2	1.3	0.17	0.57	0.17	53.5
9	R2	46	0.0	46	0.0	0.056	6.1	LOS A	0.2	1.3	0.17	0.57	0.17	52.8
Approach		58	0.0	58	0.0	0.056	5.9	LOS A	0.2	1.3	0.17	0.57	0.17	52.9
West: Arabella Street (W)														
10	L2	17	0.0	17	0.0	0.023	5.6	LOS A	0.0	0.2	0.04	0.27	0.04	55.9
11	T1	23	0.0	23	0.0	0.023	0.0	LOS A	0.0	0.2	0.04	0.27	0.04	57.4
12	R2	3	0.0	3	0.0	0.023	5.7	LOS A	0.0	0.2	0.04	0.27	0.04	55.3
Approach		43	0.0	43	0.0	0.023	2.6	NA	0.0	0.2	0.04	0.27	0.04	56.7
All Vehicles		214	0.0	214	0.0	0.056	3.0	NA	0.2	1.3	0.08	0.30	0.08	56.2

MOVEMENT SUMMARY

Site: 101 [FU AM - Kenneth Street / Woodford Street (Site Folder: General)]

Priority controlled intersection of Kenneth Street and Woodford Street
AM Peak Hour Period Future Conditions
Site Category: (None) Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kenneth Street (S)														
2	T1	136	0.0	136	0.0	0.074	0.0	LOS A	0.0	0.3	0.03	0.03	0.03	59.7
3	R2	6	0.0	6	0.0	0.074	5.9	LOS A	0.0	0.3	0.03	0.03	0.03	57.4
Approach		142	0.0	142	0.0	0.074	0.3	NA	0.0	0.3	0.03	0.03	0.03	59.6
East: Woodford Street (E)														
4	L2	5	0.0	5	0.0	0.044	5.8	LOS A	0.1	1.0	0.28	0.60	0.28	52.9
6	R2	41	0.0	41	0.0	0.044	6.4	LOS A	0.1	1.0	0.28	0.60	0.28	52.4
Approach		46	0.0	46	0.0	0.044	6.4	LOS A	0.1	1.0	0.28	0.60	0.28	52.4
North: Kenneth Street (N)														
7	L2	37	0.0	37	0.0	0.075	5.6	LOS A	0.0	0.0	0.00	0.15	0.00	57.0
8	T1	107	0.0	107	0.0	0.075	0.0	LOS A	0.0	0.0	0.00	0.15	0.00	58.6
Approach		144	0.0	144	0.0	0.075	1.4	NA	0.0	0.0	0.00	0.15	0.00	58.2
All Vehicles		332	0.0	332	0.0	0.075	1.6	NA	0.1	1.0	0.05	0.16	0.05	57.9

MOVEMENT SUMMARY

Site: 101 [FU PM - Kenneth Street / Woodford Street (Site Folder: General)]

Priority controlled intersection of Kenneth Street and Woodford Street
PM Peak Hour Period Future Conditions
Site Category: (None) Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Kenneth Street (S)														
2	T1	121	0.0	121	0.0	0.065	0.0	LOS A	0.0	0.2	0.03	0.02	0.03	59.7
3	R2	5	0.0	5	0.0	0.065	6.0	LOS A	0.0	0.2	0.03	0.02	0.03	57.4
Approach		126	0.0	126	0.0	0.065	0.3	NA	0.0	0.2	0.03	0.02	0.03	59.6
East: Woodford Street (E)														
4	L2	8	0.0	8	0.0	0.071	6.0	LOS A	0.2	1.7	0.32	0.62	0.32	52.8
6	R2	65	0.0	65	0.0	0.071	6.6	LOS A	0.2	1.7	0.32	0.62	0.32	52.3
Approach		73	0.0	73	0.0	0.071	6.5	LOS A	0.2	1.7	0.32	0.62	0.32	52.3
North: Kenneth Street (N)														
7	L2	17	0.0	17	0.0	0.093	5.6	LOS A	0.0	0.0	0.00	0.06	0.00	57.8
8	T1	163	0.0	163	0.0	0.093	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	59.4
Approach		180	0.0	180	0.0	0.093	0.5	NA	0.0	0.0	0.00	0.06	0.00	59.3
All Vehicles		379	0.0	379	0.0	0.093	1.6	NA	0.2	1.7	0.07	0.15	0.07	57.9