PROPOSED INTEGRATED HEALTH & EDUCATION PRECINCT DESIGNATION

58-68 DELANCEY STREET, ORMISTON

Traffic Impact Assessment

For 'The Hub Precinct Pty Ltd'

LAMBERT & REHBEIN
ENGINEERS • MANAGERS • SCIENTISTS

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Revision	Date	Description	Author	Verifier	Approver
A	11.08.2022	Draft Issue	EG	SW	SW
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Position: Executive Manager, Transport & Infrastructure

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1. INTRODUCTION

Lambert & Rehbein (SEQ) Pty Ltd has been commissioned by The Hub Precinct Pty Ltd to undertake a Traffic Impact Assessment for a proposed mixed use commercial development located at 58-68 Delancey Street, Ormiston QLD 4160, which is formally described as 0/SP308738, 0-2/SP308739; 0/SP308740; 4/SP308740; and 10-16/SP314782. The development site currently contains existing and approved medical and education buildings, a car park, and a portion of vacant land, with a total site area of approximately 5.2ha.

The proposed designation is for an Integrated Health & Education Precinct, consisting of a private hospital, medical consulting suites, research and education facility, residential aged care, and ancillary retail." This report has considered the sites full development potential which also includes childcare, independent living and a community hub which will be assessed at a future date via the DA process. It is understood that the development will be completed over three (3) stages. The proposed development proposes to gain access to the external road network via a new signalised intersection on Finucane Road and an existing access on Delancey Street. The proposed site layout, prepared by Destravis Group, is attached in **Appendix A**.

The development application is being pursued through the Ministerial Designation process and this traffic assessment forms part of the application material. We note that a previous detailed traffic assessment had been undertaken focussing on the proposed access to Finucane Road and was documented in a Lambert & Rehbein Technical Note (B19590TN002 Rev C) dated 10/11/2021. The intent of this initial separate engagement was to review the proposed new site access and demonstrate that a signalised intersection could be implemented in this location without significant implication for safety and efficiency of the state-controlled road network.

Subsequent to this previous work we have undertaken further detailed traffic analysis with a more network-based traffic analysis that has been undertaken in accordance with the requirements of the GTIA. This report documents the work undertaken and the findings and recommendations.

The site will be referred to as the 'development site' from hereon in.

This report has been undertaken to assess the potential impact that the proposed development could have on the external road network surrounding the site, and is set out as follows:

Section 2 discusses the existing land use and traffic arrangements in the vicinity of the proposed development site.

Section 3 provides details of the proposed development site, including an assessment of the site layout and access arrangements.

Section 4 displays the calculations and assumptions used to establish the forecast generation and distribution of the proposed development traffic including a network aggregate delay assessment based on Microsim Modelling.

Section 5 summarises the key outcomes of the traffic investigations.

Lambert & Rehbein has derived the data in this report primarily from the data provided by the Client, and a desktop site investigation.

This report has been prepared on behalf of and for the exclusive use of the Client, and is subject to and issued in connection with the provisions of the agreement between Lambert & Rehbein and the Client. Lambert & Rehbein accepts no liability or responsibility whatsoever for or in respect of any use of or reliance upon this report by any third party.

2. CONTEXT OF THE DEVELOPMENT SITE

This section of the report describes the context of the proposed development and includes a description of the existing road network, adjacent land uses, and existing public transport facilities servicing the site.

2.1 DEVELOPMENT SITE

The development site is located at 58-68 Delancey Street, Ormiston QLD 4160, which is formally described as 0/SP308738, 0-2/SP308739; 0/SP308740; 4/SP308740; and 10-16/SP314782. The development site currently contains existing and approved medical and education buildings, a car park, and a portion of vacant land, with a total site area of approximately 5.2ha.

The development site is zoned partially as 'Low Impact Industry' and partially 'Recreation and Open Space' as per the Redlands City Council Planning Scheme. The development site is generally surrounded by 'Low Density residential' developments to the north, 'Community Facilities' to the south and 'Medium Density residential' and 'neighbourhood centre' developments to the east. The development site in the context of the external road network is shown in **Figure 2-1**. The subject site has southern frontage to Finucane Road and eastern frontage to Delancey Street. There are no other road frontages from which can gain access.

Figure 2-1 Proposed Development Site

2.2 EXISTING ROAD NETWORK

Inspection of the land use, road condition, intersection characteristics, public transport facilities, pedestrian access, and cyclist provisions surrounding the proposed development site has been undertaken in preparation of this assessment. This was completed to collect information about the road network operation, safety characteristics, public transport network and specific network / land-use factors potentially of influence to the proposed development.

2.2.1 FINUCANE ROAD

Finucane Road runs along the southern frontage of the development site. Finucane Road is gazetted as a 'State Controlled Road' under the jurisdiction of the Department of Transport and Main Roads (DTMR). Additionally, we note that this section of Finucane Road at the site frontage is gazetted as a 'Limited Access Road' (LAR 2) and has a defined limited access policy. This is discussed further in **Section 3** following.

The general form of Finucane Road is shown in **Figure 2-2** and was observed to have the following characteristics at the site frontage:

- Two-way, four-lane, median divided road;
- Kerb and channel exist on the eastbound side of the road (approx. 260m along the site frontage);
- Carriageway width of approximately 16.22m (including approx. 2m median) at the site frontage;
- Finucane Road meets Delancey Street at a four-way signalised intersection, more details in **Section 2.2.3**;
- No parking permitted on either side of the road;
- Pedestrian footpaths provided on the eastbound side of the road along the site frontage; and
- Posted speed limit of 70 km/hr.

Figure 2-2 Finucane Road (Facing west)

2.2.2 DELANCEY STREET

Delancey Street is located on the eastern frontage of the development site. Delancey Street is gazetted as a 'local road' as per Redlands City Council Planning Scheme. The general form of Delancey Street is shown in **Figure 2-3** and was observed to have the following characteristics at the site frontage:

- Two-way, two-lane, median divided road;
- Kerb and channel exist on both sides of the road;
- Carriageway width of approximately 17.6m (including median and turn lanes as can been seen in **Figure 2-3**) at the site frontage;
- Delancey Street meets Finucane Road at a four-way signalised intersection, more details in **Section 2.2.3**;
- Shoulder parking permitted on both sides of the road;
- Pedestrian footpaths provided on both sides of the road; and
- Posted speed limit of 50 km/hr.

Figure 2-3 Delancey Street (Facing North)

2.2.3 DELANCEY STREET / FINUCANE ROAD SIGNALISED INTERSECTION

The Delancey Street / Finucane Road signalised intersection is an existing four-way signalised intersection located at the south-eastern corner of the development site. The existing intersection layout is as demonstrated in the aerial imagery provided in **Figure 2-4**. It should be noted that as a result of the proposal, the Delancey Street / Finucane Road signalised intersection will be upgraded. More details are provided in **Section 4** regarding the proposed upgrades.

Figure 2-4 Existing Delancey Street / Finucane Road Signalised Intersection

3. DETAILS OF THE PROPOSED DEVELOPMENT

This section of the report describes the nature of the proposed development, the proposed access arrangements, servicing arrangements and on-site manoeuvrability.

3.1 PROPOSED DEVELOPMENT

The proposed designation is for an Integrated Health & Education Precinct, consisting of a private hospital, medical consulting suites, research and education facility, residential aged care, and ancillary retail." This report has considered the sites full development potential which also includes childcare, independent living and a community hub which will be assessed at a future date via the DA process. It is understood that the development will be completed over three (3) stages.

The proposed site layout and detailed functional plans, prepared by Destravis Group, are attached in **Appendix A**. We note that these planning layouts have evolved as design of the site has developed and further details of the site gradings and conceptual engineering design has also evolved. As such the current broad land uses have changed as the site constraints have become known.

A summary of the proposed yields as currently proposed are summarised in **Table 3-2**.

Table 3-1 Proposed Development Yields

USE	YIELDS	
PRIVATE HOSPITAL	148 Beds + 14 Theatres	22,411m^2 GFA
DAY SURGERY	18 Day Beds (inc. within the Private Hospital)	
MEDICAL SPECIALISTS IN CONSULTING SUITES BLDG	-	4,614 m^2 GFA
CHILD CARE	150 Places	1,200 m^2 GFA
SPECIAL RETAIL	-	6,213 m^2 GFA
RESEARCH INSTITUTE	-	4,407 m^2 GFA
ASSISTED LIVING UNIT & FACILITIES	200 Units + Facilities	25,000 m^2 GFA
COMMUNITY HUB	-	2,000 m^2 GFA
AGED CARE	80 Beds + Ancillary Area	6,756 m^2 GFA
TOTAL		**72,601 m^2 GFA**

We note that traffic modelling undertaken for the project has included detailed SIDRA intersection analysis and detailed microsimulation modelling utilising the Aimsun modelling package (see Section 4 of this report). The modelling work undertaken was significant and was based on a previous land use scheme that had estimated a higher development yield that the current proposal. This relates to the areas and number of beds adopted for the Aged Care Facility. The yield adopted in the traffic modelling is shown in **Table 3-2** below and clearly represents a higher development yield and as such a higher level of traffic generation.

On this basis we have not provide new traffic modelling scenarios as the modelling undertaken will inherently include safety margins due to the higher traffic generation rates.

Table 3-2 Proposed Development Yields

USE	YIELDS	
PRIVATE HOSPITAL	148 Beds + 14 Theatres	22,411m^2 GFA
DAY SURGERY	18 Day Beds	
MEDICAL SPECIALISTS IN CONSULTING SUITES BLDG	-	4,614 m^2 GFA
CHILD CARE	150 Places	1,200 m^2 GFA
SPECIAL RETAIL	-	6,213 m^2 GFA
RESEARCH INSTITUTE	-	4,407 m^2 GFA
ASSISTED LIVING UNIT & FACILITIES	200 Units + Facilities	25,000 m^2 GFA
COMMUNITY HUB	-	2,000 m^2 GFA
AGED CARE	134 Beds + Ancillary Area	11,163 m^2 GFA
TOTAL		**77,008 m^2 GFA**

3.2 ACCESS ARRANGEMENTS

The proposed development will gain access to the external network via a new signalised intersection on Finucane Road. Finucane Road is gazetted a State Controlled Road and a Limited Access Road along the site frontage.

The development site has an existing priority-controlled, all-movement access provided on Delancey Street, which is designated a local road as per the Redlands City Council. For a development of the nature proposed, it is not considered viable from a traffic engineering perspective to have this access as the sole access into the proposed development. This would lead to safety concerns due to delay and general congestion on Delancey Street and the consequential impacts on the state-controlled road network as drivers becoming impatient. There is additionally limited opportunity to "significantly" upgrade the existing site access on Delancey Street given the constraints associated with land ownership and intersection proximity. It should be noted that as a result of the proposed development, the Delancey Street Access will be upgraded to ban right turns out of the site and to include a 20m left turn lane into the site. A SIDRA intersection analysis of the Delancey Street Access intersection has been completed and has been included in **Section 4**.

The proposed signalised access intersection on Finucane Road will operate efficiently whilst also preserving the functionality, safety and efficiency of the state-controlled road. The intersection design will also ensure vulnerable users such as cyclists and pedestrians are accommodated and protected through the design of this access. A SIDRA intersection analysis of the proposed Finucane Road intersection has been completed and has been included in **Section 4**.

As part of the current conceptual designs, bicycle lanes have been provided on both sides of Finucane Road, and signalised pedestrians crossings have been provided across the site access and the Finucane Road eastern approach. We note that a signalised pedestrian crossing has not been provided on the Finucane Road western approach given there will likely be no pedestrian demand at this location.

The Concept Design for the site access intersection is shown in the plans prepared by Mortons Urban Solutions which have been informed by the detailed traffic modelling work undertaken as part of this project and as described in Section 4 following. The concept design of the intersection is included in **Drawing No. 37801-XWP-005 Amend. A** and included in **Appendix F** of this report.

3.3 LIMITED ACCESS POLICY

As discussed during pre-lodgement meetings with the SARA / DTMR, we note that Finucane Road along the site frontage is a limited access road (LAR 2) and as such the intent of the limited access policy requires consideration and assessment. We note that the current SDAP outlines that access to a road classified as a LAR 2 road can be considered subject to assessment.

Further detailed traffic analysis has been completed and documented further in this traffic report and clearly shows that operationally the proposed access intersection is adequate from an operational perspective for a notional 10 year design horizon.

The new intersection will provide approximately 370m of spacing to the signalised intersection of Finucane Road and Delancey Street which we note is slightly short of the 400m spacing requirement outlined in the Limited Access Policy albeit that we are of the view that the intent is achieved. It is important to note that the location of the proposed signalised intersection has been moved as far west along the site frontage as is physically possible. The location is constrained by the environmental corridor along the western side of the land and the existing bridge structure on Finucane Road.

We note that the proposed turn lanes have been reduced to ensure that the proposed access will not interfere on the ability for the adjacent intersection to be upgraded and that the intersection can be designed to meet the safety and design criteria set out in the Road Planning and Design Manual and/ or Austroads Guides, as per the Limited Access Policy.

4. IMPACT ASSESSMENT

This section provides details of the potential impact that the development traffic could have on the operation of the existing site access and the proposed new site access intersection. In particular, the assessment has focused on the existing Delancey Street priority-controlled access intersection at the north-eastern corner of the site, as well as proposed signalised access intersection on Finucane Road at the southern site boundary.

In addition, we have undertaken a detailed microsimulation modelling exercise, utilising the Aimsun modelling package, for the purposes of assessing the net delays impacts of the proposal on the external road network in accordance with the GTIA principles. This is discussed in more detail in Section 4.7 following.

4.1 BACKGROUND TRAFFIC

Vehicle movement survey data was collected at the following intersections on 29th March 2022:

• Finucane Road / McDonald Road; • Finucane Road / Dawson Road; • Finucane Road / Delancey Street; • Finucane Road / Wellington Street;	• Wellington Street / Russell Street; • Wellington Street / Freeth Street; and • Delancey Street / Freeth Street;

Vehicle movement data for the traffic moving in and out of the existing Delancey Street Access was collected on Thursday 29 October 2020. The through volumes utilised for this intersection were carried from the 2022 counts from the intersections to the north and south.

The intersection count data was collected from 6:00 AM to 9:00 AM and 2:30 PM to 6:30 PM, presented in 15-minute periods to capture peak periods.

The AM and PM peak hours for the intersections were found to be as follows:

- AM: 7:45 AM to 8:45 AM; and
- PM: 4:00 PM to 5:00 PM.

Summary of traffic survey data is displayed in **Figure C1** attached in **Appendix C**, with detailed traffic survey data included in **Appendix B**.

The opening year for the development is proposed to be 2024. To assess the future background traffic a linear growth rate of 1% per annum has been applied to all movements along Finucane Road and Delancey Street. It should be noted that the background traffic entering and exiting the existing site have not been grown. The predicted background traffic in 2024 and 2034 (10-year design horizon) has been presented in **Figure C2** and **Figure C3** attached in **Appendix C**.

4.2 IMPACT ASSESSMENT AREA

The impact assessment area that has been included in the network based Aimsun micro-simulation model, which is attached in **Appendix D**, is as illustrated in **Figure 4-1**. It should be noted that this micro-simulation traffic model includes the proposed Finucane Road Site Access Intersection.

Figure 4-1 Impact Assessment Area

4.3 TRIP GENERATION

Additional traffic associated with the proposed development has been forecasted, using industry accepted peak hour traffic generation rates, from the RMS (formally RTA) Guide to Traffic Generating Developments and The Department of Transport and Main Roads (DTMR) Open Source Data, for development land uses. The traffic generation rates and in/out directionality of movements adopted for the analysis within this assessment, are shown in **Table 4-1**. For the purposes of this assessment, the speciality retail AM trip generation rate has been taken as 50% of the PM trip generation. The community hub has also been assumed to be ancillary to the development and will not generate individual trips external to the site.

Table 4-1 Generation & Directionality Rates

LAND USE	GENERATION RATE		DIRECTIONALITY (% IN / % OUT)		SOURCE
	AM Peak	PM Peak	AM Peak	PM Peak	
PRIVATE HOSPITAL	-22.07 trips +1.04 trips x beds	-22.07 trips +1.04 trips x beds	50% in / 50% out	50% in / 50% out	RMS (formally RTA)
DAY SURGERY					
MEDICAL SPECIALISTS IN CONSULTING SUITES BLDG	9.81 trips / 100m^2 GFA	5.80 trips / 100m^2 GFA	50% in / 50% out	50% in / 50% out	DTMR Open Source Data
CHILD CARE	0.8 trips / child	0.7 trips / child	50% in / 50% out	50% in / 50% out	RMS (formally RTA)
SPECIAL RETAIL	2.8 trips / 100m^2 GFA	5.6 trips / 100m^2 GFA	50% in / 50% out	50% in / 50% out	RMS (formally RTA)
RESEARCH INSTITUTE	2 trips / 100m^2 GFA	2 trips / 100m^2 GFA	90% in / 10% out	10% in / 90% out	RMS (formally RTA)
ASSISTED LIVING UNIT & FACILITIES	0.2 trips per dwelling	0.2 trips per dwelling	80% in / 20% out	20% in / 80% out	RMS (formally RTA)
AGED CARE	0.2 trips per dwelling	0.2 trips per dwelling	80% in / 20% out	20% in / 80% out	RMS (formally RTA)
COMMUNITY HUB	-	-	-	-	

Due to the nature of the site containing various mixed uses, it is expected that there will be cases of drivers visiting more than one (1) use during the same trip. These trips represent the likely cross-utilisation of the site and described as 'linked trips', they generally result in a reduction of trips to and from the site. A 10% reduction has been assumed for the overall trips generated by the development site which will provide a reasonable forecast of potential traffic demands. As such, based on the above guidelines and assumptions, the estimated traffic generated by the proposed development is documented in **Table 4-2**.

Table 4-2 Development Traffic Generation

LAND USE	YIELD	AM(IN)	AM (OUT)	PM (IN)	PM (OUT)
PRIVATE HOSPITAL	148 BEDS + 14 THEATRES	75	75	75	75
DAY SURGERY	18 Day Beds				
MEDICAL SPECIALISTS IN CONSULTING SUITES BLDG	4,614 m^2 GFA	226	226	134	134
CHILD CARE	150 PLACES	60	60	53	53
SPECIAL RETAIL	6,213 m^2 GFA	87	87	174	174
RESEARCH INSTITUTE	4,407 m^2 GFA	79	9	9	79
ASSISTED LIVING UNIT & FACILITIES	200 UNITS + FACILITIES	32	8	8	32
AGED CARE	134 BEDS + Ancillary Area	21	5	5	21
COMMUNITY HUB	2,000 m^2 GFA	-	-	-	-
Total Trips per Peak (10% Cross-Utilisation)		**524**	**424**	**412**	**512**

As illustrated in **Table 4-2**, the proposed development is anticipated to generate approximately 948 trips during AM peak and 924 trips during the PM peak.

4.4 TRIP DISTRIBUTION

The trip distribution adopted within the model is 77%:23% split between the Finucane Road and Delancey Street accesses. The SIDRA intersection assessment adopted the distribution of traffic through the network that was an output from the Aimsun Micro-simulation Model, which has been included in **Appendix D** noting the availability of various route choices through the network.

4.5 DEVELOPMENT TRAFFIC

Based on the trip distribution outlined in **Section 4.4**, the trip generation for the development is displayed in **Figure C4**, attached in **Appendix C**.

It should be noted that due to the proposed upgrades, traffic movements through the network have altered including alterations to the “background” traffic. Where there are multiple routes available, and the proposal includes upgrades to address existing network constraints, it is routine that there will be some diversion of traffic as a result of improvements made to suit other network movement options. It is this diversion of traffic through the network as a result of the proposed upgrades that has resulted in the negative volumes on turning movements within the network.

4.6 DESIGN TRAFFIC

The design traffic scenarios (background traffic plus the development generated traffic) in 2024 and 2034, are displayed in **Figure C6** and **Figure C7**, respectively attached in **Appendix C**.

4.7 IMPACT ASSESSMENT BASED ON MICROSIM MODELLING

Due to the volume of traffic that the proposed development site is anticipated to generate in the peak hours, the proposed development traffic was assessed in relation to the potential for it to impact over a broader area along the state-controlled and council-controlled road networks. The extent of the potential impacts included a broader “network” of road where various route choices were available which. As such, an assessment of the existing road network, including all stages of the development, was completed to analyse the operational impacts on the surrounding road network based on Aimsun Micro-simulation as opposed to relying solely on SIDRA based analysis. The micro-simulation model has been built with the existing (2022) surrounding road network traffic demand, as outlined in **Section 4.1**. The micro-simulation modelling report prepared by Adanner Pty Ltd has been attached in **Appendix D**.

The micro-simulation model has applied the background traffic (growth rate=1%), trip generation, trip distribution, development traffic and design traffic highlighted above in **Section 4.2**, **Section. 4.3**, **Section 4.4** and **Section 4.5**.

As part of the modelling of the development impacts the Aimsun micro-simulation model has been utilised to test with and without development scenarios along with the testing of various road network improvements that were being contemplated. This allowed the project team to identify the most effective mitigation strategies that would deliver the maximum benefit to the existing road users and would mitigate the impacts of the development and the new signalised intersection proposed on Finucane Road. The vehicle delay assessments were based on the microsimulation modelled outputs and importantly, the methodology associated with the delay assessment appropriately dealt with the redirected "background traffic" applying the "with development" network delays for the "base case" and "upgraded" networks to the background traffic only. This was done by essentially applying different vehicle types to the background and development traffic so they could be easily separated from within the micro-simulation model. This approach is consistent with the GTIA requirements.

Table 4-3 shows an aggregate delay assessment of the network in the existing configuration (no mitigation upgrades), undertaken in accordance with the GTIA. The average vehicle delays for each of the individual intersections within the analysis can be found in the micro-simulation modelling report included in **Appendix D**.

Table 4-3 Delay Assessment – Existing Configuration

INTERSECTION	PEAK PERIOD	AGGREGATE INTERSECTION-DELAY (VEHICLE-MINUTES)		ID = $\sum_{i=1}^{n} WD - \sum_{i=1}^{n} BC$	
		$\sum BC$	$\sum WD$	Δ	%
Existing Configuration (No upgrades)	AM Peak	629,062	805,784	176,722	28.09%
	PM Peak	532,573	618,853	86,280	16.2%
	Combined Peaks	**1,161,635**	**1,424,637**	**263,002**	**22.64%**

The assessment found that with no mitigation upgrades the development generated traffic would increase the aggregate intersection delay by more than 5%. As such, mitigation works to the network are required.

Due to its proximity to the proposed development site, the Finucane Road / Delancey Street signalised intersection was analysed to determine if mitigation upgrades could be undertaken to improve the performance of the overall surrounding network.

We propose that the form of the Finucane Road / Delancey Street intersection be designed generally as shown in **Figure 4-2**. Due to traffic volumes and logistically fitting the intersection into the available road reserve, the following intersection configuration in our view is ideal.

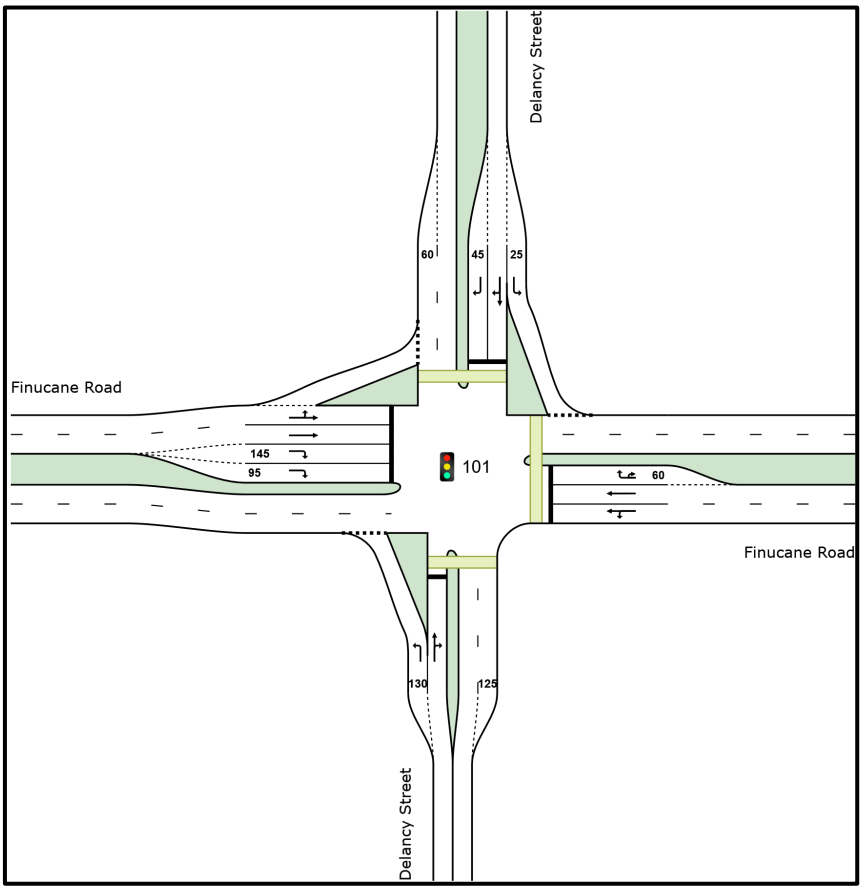


Figure 4-2 Proposed Finucane Road / Delancey Street Signalised Intersection Layout

Table 4-4 shows an aggregate delay assessment of the network including the above mitigation upgrades to the Finucane Road / Delancey Street signalised intersection, undertaken in accordance with the GTIA. It should be noted that the reconfiguration of the intersection has resulted in a change to the current signal phasing plan. Details of the updated signal phasing are included in the micro-simulation model report attached in **Appendix D**. The average vehicle delays for each of the individual intersections within the analysis can be found in the micro-simulation modelling report included in **Appendix D**.

Table 4-4 Delay Assessment – With Upgrades

INTERSECTION	PEAK PERIOD	AGGREGATE INTERSECTION-DELAY (VEHICLE-MINUTES)		ID = $\sum_{i=1}^{n} WD - \sum_{i=1}^{n} BC$	
		$\sum BC$	$\sum WD$	Δ	%
Mitigation (With upgrades)	AM Peak	629,062	615,128	-13,934	-2.22%
	PM Peak	532,573	433,418	-99,155	-18.62%
	Combined Peaks	**1,161,635**	**1,048,546**	**-113,089**	**-9.74%**

As demonstrated in **Table 4-4**, the assessment found that the development generated traffic would increase the aggregate intersection delay by less than 5% if mitigation upgrades are undertaken to the Finucane Road / Delancey Street signalised intersection, as illustrated in **Figure 4-2**. The results demonstrate that the performance of the network would theoretically improve with the proposed mitigation upgrades, with a decrease in the average delay experienced through the network.

On the basis of the above, and with the implementation of the proposed upgrade works at the intersection of Finucane Road / Delancey Street, in our view that project will result in a “no net worsening” of delay to the

state-controlled road network and on this basis will satisfy the requirements of the SDAP Codes and the GTIA analysis process and guidelines.

The implementation of the proposed upgrade has been contemplated in some detail given the existing corridor widths available and the land ownership constraints. It is noted that the verge on the southern side of the Finucane Road frontage adjacent to the intersection is relatively narrow and while this land appears to be relatively unconstrained it is understood to be owned by the State.

In advancing the conceptual design of the proposed intersection upgrades we note that the project team has developed a solution that appears to be able to be accommodated within the existing road corridor or within land that forms part of the proposal.

The Concept Design for the proposed upgrade works at the subject intersection is shown in the plans prepared by Mortons Urban Solutions which have been informed by the detailed traffic modelling work undertaken and documented above. The concept design of the intersection is included in **Drawing No. 37801-XWP-005 Amend. A** and included in **Appendix F** of this report.

It is proposed that these works will be implemented as part of the ultimate project delivery.

4.8 ACCESS ARRANGEMENTS - IMPACT ASSESSMENT

4.8.1 SIDRA ANALYSIS ASSUMPTIONS

The following scenario provides an assessment of the proposed Finucane Road signalised access intersection as well as the existing priority-controlled access intersection via Delancey Street.

The following parameters have been applied to the SIDRA model:

- A Saturation Flow of 1,950 through car units per hour;
- A Peak Flow Period of 30 minutes, with a conservative Peak Flow Factor of 95%;
- Heavy vehicle volumes based on the traffic survey count data;
- Intersection geometry based on measurements of aerial imagery supplemented with on-site measurements; and
- Gap acceptance parameters based on default SIDRA values (for the right turn out of Arthur Street at the Delancey Street site access intersection, the gap acceptance parameters outlined in AUSTROADS GTRD Part 4A Table 3.5 for a right turn from minor road across a two-lane / two-way road have been adopted).

4.8.2 EXISTING SITE ACCESS ON DELANCEY STREET

SIDRA Intersection software has been used to assess the performance of the Finucane Road signalised access intersection. **Figure 4-3** shows the proposed intersection configuration as modelled in the SIDRA analysis.

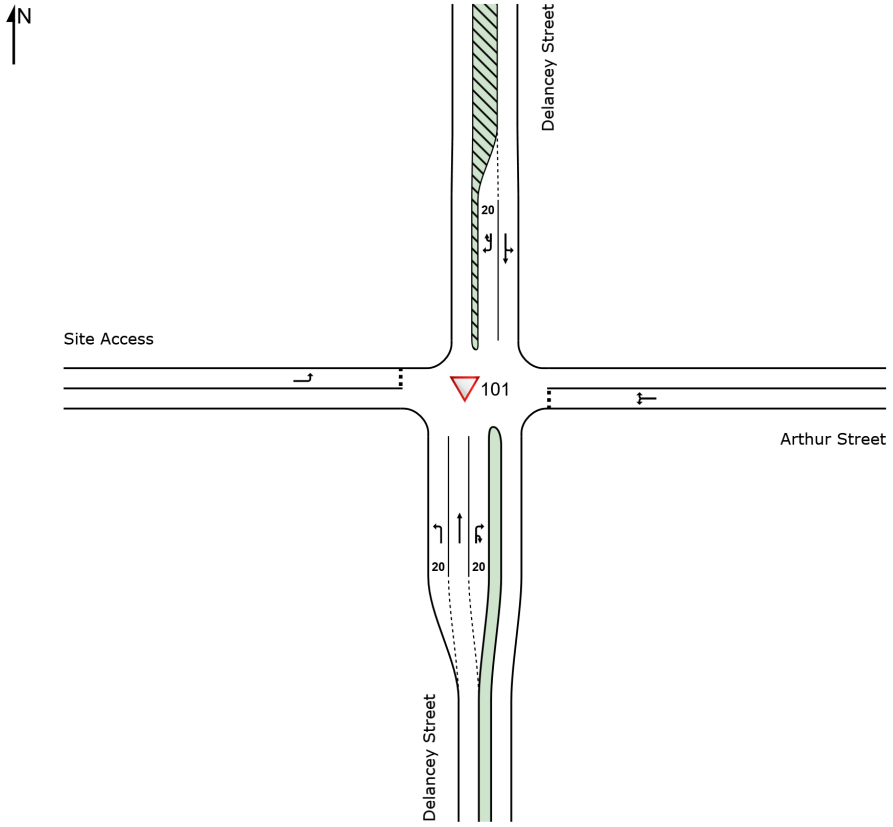


Figure 4-3 Delancey Street / Site Access / Arthur Street Intersection Layout

Table 4-5 presents the results of the Delancey Street access intersection SIDRA analysis for 2024 and 2034 with development scenarios, with detailed movement summary SIDRA outputs included in **Appendix E**.

Table 4-5 Delancey Street / Site Access / Arthur Street Intersection SIDRA Outputs

SCENARIO	APPROACH		AM PEAK				PM PEAK			
			DoS	Avg Delay (s)	LoS	95% Back of Queue (m)	DoS	Avg Delay (s)	LoS	95% Back of Queue (m)
2024 Design (Background + Development)	Delancey Street (S)	Left	0.045	5.6	LOS A	0	0.034	5.6	LOS A	0
		Through	0.182	0	LOS A	0	0.174	0	LOS A	0
		Right	0.008	7.7	LOS A	0.2	0.01	6.9	LOS A	0.3
		U-turn	0.008	11.7	LOS B	0.2	0.01	9.8	LOS A	0.3
		Approach	0.182	1.2	NA	0.2	0.174	1.1	NA	0.3
	Arthur Street (E)	Left	0.024	8.6	LOS A	0.5	0.014	7.5	LOS A	0.3
		Right	0.024	18	LOS C	0.5	0.014	14.6	LOS B	0.3
		Approach	0.024	11.4	LOS B	0.5	0.014	9.3	LOS A	0.3
	Delancey Street (N)	Left	0.301	5.6	LOS A	0	0.225	5.6	LOS A	0
		Through	0.301	0.1	LOS A	0	0.225	0.1	LOS A	0
		Right	0.111	7.6	LOS A	3.1	0.078	7.3	LOS A	2.1
		U-turn	0.111	9.3	LOS A	3.1	0.078	9.1	LOS A	2.1
		Approach	0.301	1.2	NA	3.1	0.225	1.2	NA	2.1
	Site Access (W)	Left	0.143	7.3	LOS A	3.7	0.199	7.4	LOS A	5.5
		Approach	0.143	7.3	LOS A	3.7	0.034	5.6	LOS A	0
2034 Design (Background + Development)	Delancey Street (S)	Left	0.045	5.6	LOS A	0	0.034	5.6	LOS A	0
		Through	0.244	0.1	LOS A	0	0.194	0	LOS A	0
		Right	0.011	8.2	LOS A	0.3	0.011	7.1	LOS A	0.3
		U-turn	0.011	12.7	LOS B	0.3	0.011	10.2	LOS B	0.3
		Approach	0.244	1	NA	0.3	0.194	1	NA	0.3
	Arthur Street (E)	Left	0.037	9.2	LOS A	0.8	0.017	7.7	LOS A	0.4
		Right	0.037	23.6	LOS C	0.8	0.017	16.2	LOS C	0.4
		Approach	0.037	14	LOS B	0.8	0.017	9.6	LOS A	0.4
	Delancey Street (N)	Left	0.335	5.6	LOS A	0	0.245	5.6	LOS A	0
		Through	0.335	0.1	LOS A	0	0.245	0.1	LOS A	0
		Right	0.129	8.5	LOS A	3.5	0.082	7.6	LOS A	2.2
		U-turn	0.129	10.7	LOS B	3.5	0.082	9.5	LOS A	2.2
		Approach	0.335	1.3	NA	3.5	0.245	1.1	NA	2.2
	Site Access (W)	Left	0.166	8.2	LOS A	4.2	0.208	7.6	LOS A	5.7
		Approach	0.045	5.6	LOS A	0	0.034	5.6	LOS A	0

As illustrated in **Table 4-5**, the Delancey Street access will operate below the practical capacity for a priority-controlled intersection (DoS<0.8, Delay<42 sec) at both the year of opening (2024) and a 10-year design horizon (2034) in both peak periods.

4.8.3 PROPOSED SITE ACCESS ON FINUCANE ROAD

SIDRA Intersection software has been used to assess the performance of the Finucane Road signalised access intersection. **Figure 4-4** shows the proposed intersection configuration as modelled in the SIDRA analysis.

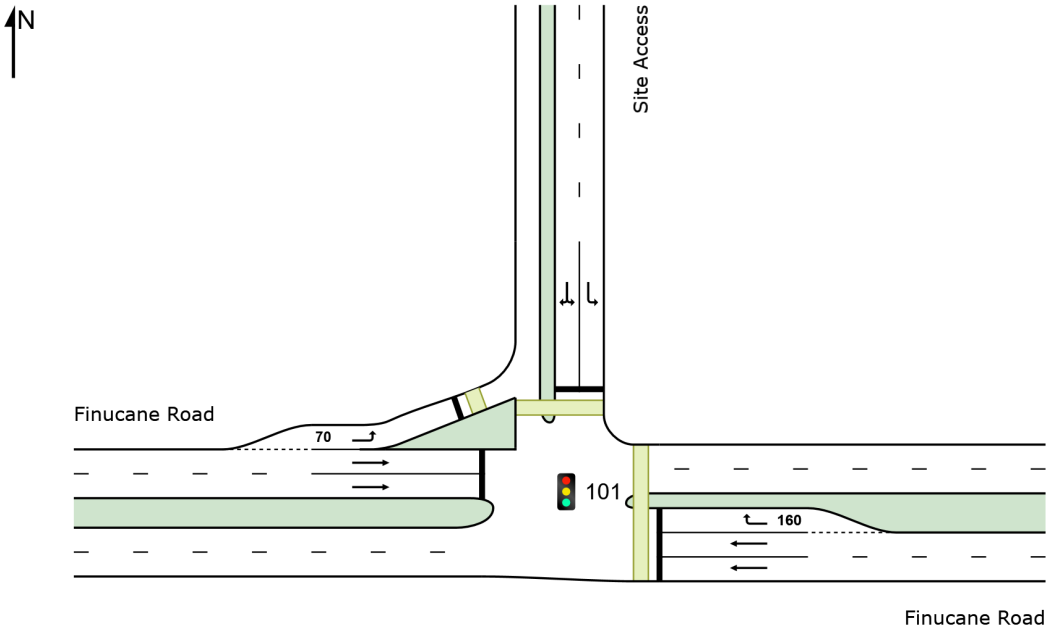


Figure 4-4 Proposed Finucane Road Signalised Access Intersection

The signal phasing plan adopted in both peak periods can be seen in **Figure 4-5.** A cycle time of 90 seconds has been adopted for this analysis.

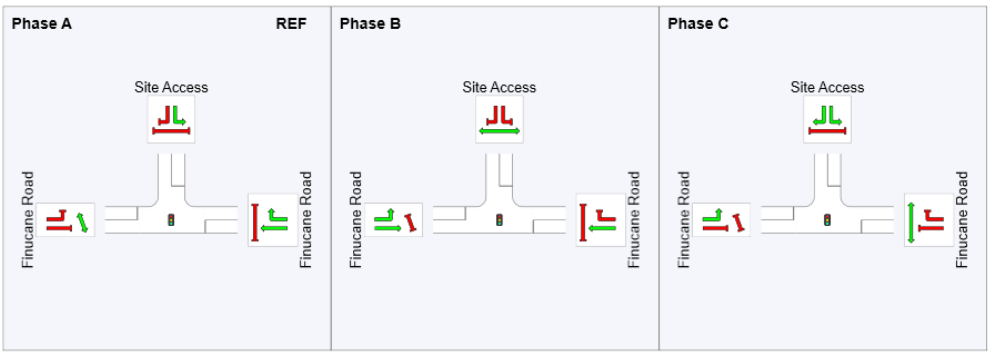


Figure 4-5 Finucane Road Signalised Access Intersection Signal Phasing

Table 4-6 presents the results of the Finucane Road access intersection SIDRA analysis with detailed movement and phasing SIDRA Outputs attached in **Appendix E**.

Table 4-6 Finucane Road Signalised Access Intersection SIDRA Outputs

SCENARIO	APPROACH		AM PEAK				PM PEAK			
			DoS	Avg Delay (s)	LoS	95% Back of Queue (m)	DoS	Avg Delay (s)	LoS	95% Back of Queue (m)
2024 Design (Background + Development)	Finucane Road (E)	Through	0.595	6.9	LOS A	126	0.601	9.4	LOS A	133.3
		Right	0.604	47.1	LOS D	45.4	0.633	49.4	LOS D	40.9
		Approach	0.604	10.3	LOS B	126	0.633	12.6	LOS B	133.3
	Site Access (N)	Left	0.212	27.3	LOS C	30	0.249	25.5	LOS C	37.4
		Right	0.517	44.5	LOS D	43.7	0.612	41.1	LOS D	68.6
		Approach	0.517	36.2	LOS D	43.7	0.612	34.4	LOS C	68.6
	Finucane Road (W)	Left	0.178	9.5	LOS A	22.4	0.143	8.8	LOS A	16.5
		Through	0.620	16.7	LOS B	136.5	0.623	18.7	LOS B	132.6
		Approach	0.62	15.5	LOS B	136.5	0.623	17.2	LOS B	132.6
2034 Design (Background + Development)	Finucane Road (E)	Through	0.637	7.3	LOS A	142.1	0.641	8.8	LOS A	147.3
		Right	0.659	48.9	LOS D	46.7	0.633	49.4	LOS D	40.9
		Approach	0.659	10.6	LOS B	142.1	0.641	11.7	LOS B	147.3
	Site Access (N)	Left	0.219	28.1	LOS C	30.5	0.264	27.1	LOS C	38.8
		Right	0.670	46.4	LOS D	59.2	0.684	44.1	LOS D	72.1
		Approach	0.67	38.7	LOS D	59.2	0.684	36.8	LOS D	72.1
	Finucane Road (W)	Left	0.175	9.2	LOS A	21.4	0.143	8.8	LOS A	16.5
		Through	0.713	17.1	LOS B	170.8	0.695	18.2	LOS B	159.6
		Approach	0.713	15.9	LOS B	170.8	0.695	17	LOS B	159.6

As illustrated in **Table 4-6**, the Finucane Road access will operate within the reasonable operational limits for a signalised intersection (notionally DoS<0.9) at both the year of opening (2024) and a 10-year design horizon (2034) in both peak periods. Queues on the eastern Finucane Road approach will remain within turn lanes and clear of the adjacent Delancey Street signalised intersection. Queues on the western Finucane Road approach will remain within turn lanes and clear of adjacent intersections.

The operational analysis shows that the proposed signalised intersection would operate at an acceptable level for the ten-year design horizon and importantly all traffic would be able to clear during each relevant phase.

We note that this analysis has been based on the intersection being analysed as an isolated intersection and not part of a network. The micro-simulation model report includes the proposed Finucane Road access intersection, demonstrating that a network-based analysis results in even better operational outcomes that that demonstrated in **Table 4-6**.

The Concept Design for the site access intersection is shown in the plans prepared by Mortons Urban Solutions which have been informed by the detailed traffic modelling work undertaken and described above. The concept design of the intersection is included in **Drawing No. 37801-XWP-005 Amend. A** and included in **Appendix F** of this report.

5. SUMMARY

Lambert & Rehbein (SEQ) Pty Ltd has been commissioned by The Hub Precinct Pty Ltd undertake a Traffic Impact Assessment for a proposed mixed use commercial development located at 58-68 Delancey Street, Ormiston QLD 4160, which is formally described as 0/SP308738, 0-2/SP308739; 0/SP308740; 4/SP308740; and 10-16/SP314782. The development site currently contains existing and approved medical and education buildings, a car park, and a portion of vacant land, with a total site area of approximately 5.2ha.

The proposed designation is for an Integrated Health & Education Precinct, consisting of a private hospital, medical consulting suites, research and education facility, residential aged care, and ancillary retail." This report has considered the sites full development potential which also includes childcare, independent living and a community hub which will be assessed at a future date via the DA process. It is understood that the development will be completed over three (3) stages. The proposed development proposes to gain access to the external road network via a new signalised intersection on Finucane Road and an existing access on Delancey Street. The proposed site layout, prepared by Destravis Group, is attached in **Appendix A**.

The development application is being pursued through the Ministerial Designation process and this traffic assessment forms part of the application material.

The development proposes to gain access directly to the State-controlled road network via a new signalised intersection on Finucane Road to the west of the existing Delancey Street intersection. The site will also gain access to the Delancey Street albeit that the existing all-movements access will be reconfigured to remove the right turn egress from the subject land.

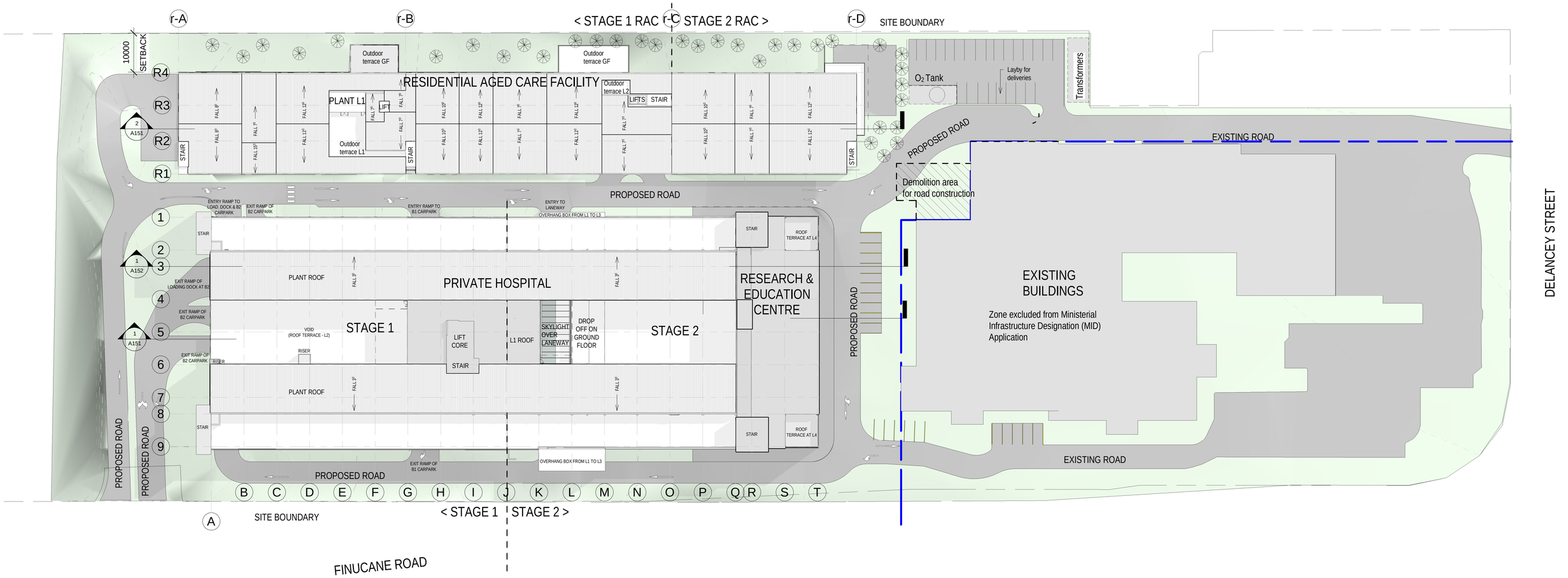
Given the intent to provide a new signalised intersection on Delancey Street, the traffic assessment has included undertaking a detailed assessment of the site intersections for a 10 year design horizon beyond the potential year of opening of 2024. This analysis indicated that the proposal for the new signalised intersection can be incorporated into the state-controlled road network in a manner that will achieve an acceptable level of operational efficiency and can be delivered in a manner consistent with the applicable guidelines. Conceptual functional layout plans have been developed for the site access intersection and are shown in **Drawing No. 37801-XWP-005 Amend. A** and included in **Appendix F** of this report.

On the basis of the development including a new intersection on the state-controlled road network we have also undertaken a detailed traffic modelling assessment based on a detailed microsimulation modelling approach. This analysis determined that the development, along with the new signalised intersection would have a relatively significant impact on the net delays through the network. As a part of the modelling process assessment of suitable road network options were undertaken and an upgraded layout for the Delancey Street signalised intersection was developed to mitigate the development impacts. The changes proposed can be delivered within the road network, within any land take contained with land that forms part of the application, and deliver a significant net benefit to the network-based delays.

Conceptual functional layout plans for the upgrades at the Finucane Road / Delancey Street intersection and are shown in **Drawing No. 37801-XWP-005 Amend. A** and included in **Appendix F** of this report.

Based on the detailed traffic analysis and modelling undertaken we are of the view that the proposal can be supported from a traffic perspective.

APPENDIX A – SITE PLANS



CLARIFICATIONS AND DISCLAIMERS

1. THE MAXIMUM BUILDING HEIGHT VARIES IN RELATION TO THE ADJACENT AT GRADE GROUND LEVEL DUE TO SITE TOPOGRAPHY
2. REFER TO BUILDING SECTIONS FOR BUILDING HEIGHT INFORMATION, WHICH ARE TO BE READ IN CONJUNCTION WITH SITE PLANS FOR AT GRADE GROUND LEVELS
3. ALL PLANS ARE PRELIMINARY AND SUBJECT TO FURTHER DEVELOPMENT OF THE FUNCTIONAL BRIEF AND FINAL DESIGN
4. TENANCY SPACES ARE PROVIDED AS "COLD SHELL" AREAS FOR FIT OUT BY TENANTS
5. PARKING NUMBERS ARE SUBJECT TO DEVELOPMENT OF THE FINAL DESIGN FINAL DESIGN

0 5 10 15 m
SCALE 1:500 AT ORIGINAL SIZE

DESTRAVIS GROUP

PRELIMINARY

REV	DESCRIPTION	DATE	INIT
1	Revision 2	28/02/2023	
2	Revision 3	10/03/2023	NB
3	Coordination and Comments	27/03/2023	NB
4	Client's comments incorporated	04/04/2023	NS
5	MID Issue	26/04/2023	NS

CLIENT
THE HUB PRECINCT PTY LTD

PROJECT NAME
Hub68 Centre of Excellence - Aging & Wellness

LOCATION
58-68 DELANCEY STREET, ORMISTON QLD 4160

STATUS
MID ISSUE

DRAWING
STG2 - WHOLE SITE PLAN

SCALE @ A1
1 : 500

DATE
26/04/2023

DRAWN BY
JPS, NB & NS

JOB No
4_2301_03

DWG No
A140

REV
5

NORTH

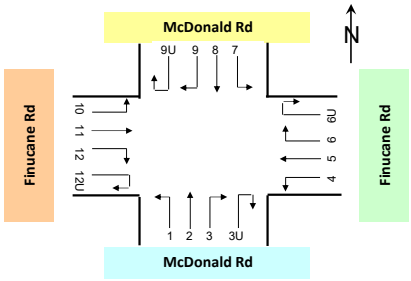
Plot Date: 27/04/2023 10:24:37 AM

File Path: D:\Destravis Dropbox\DES_Projects\Hub 68_Cleveland M\DA\23_Working Drawings\230427 - HUB68 Centre of Excellence - Aging & Wellness.rvt

APPENDIX B- RAW TRAFFIC SURVEY DATA

Job No. : AUQLD3388
Client : Lambert & Rehbein (SEQ) Pty Ltd
Suburb : Cleveland
Location : 1. Finucane Rd / McDonald Rd

Day/Date : Tue, 29 Mar 2022
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary

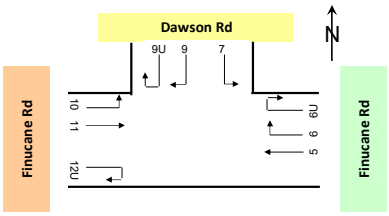


	Approach	McDonald Rd			Finucane Rd			McDonald Rd			Finucane Rd			Grand Total
	Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
AM	7:45 to 8:45	140	2	**142**	1,396	40	**1,436**	291	6	**297**	1,171	52	**1,223**	**3,098**
PM	16:00 to 17:00	125	2	**127**	1,269	24	**1,293**	163	0	**163**	1,377	18	**1,395**	**2,978**

Approach	McDonald Rd			Finucane Rd			McDonald Rd			Finucane Rd			Grand Total
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
6:00 to 7:00	50	1	**51**	979	21	**1,000**	87	6	**93**	554	32	**586**	**1,730**
6:15 to 7:15	59	0	**59**	1,056	23	**1,079**	90	5	**95**	624	35	**659**	**1,892**
6:30 to 7:30	60	0	**60**	1,159	26	**1,185**	110	4	**114**	723	41	**764**	**2,123**
6:45 to 7:45	61	0	**61**	1,173	31	**1,204**	120	3	**123**	808	39	**847**	**2,235**
7:00 to 8:00	69	0	**69**	1,206	31	**1,237**	153	3	**156**	953	49	**1,002**	**2,464**
7:15 to 8:15	85	0	**85**	1,258	36	**1,294**	205	6	**211**	1,101	50	**1,151**	**2,741**
7:30 to 8:30	114	1	**115**	1,335	38	**1,373**	254	7	**261**	1,162	50	**1,212**	**2,961**
7:45 to 8:45	140	2	**142**	1,396	40	**1,436**	291	6	**297**	1,171	52	**1,223**	**3,098**
8:00 to 9:00	142	2	**144**	1,451	48	**1,499**	280	6	**286**	1,118	44	**1,162**	**3,091**
AM Totals	**261**	**3**	**264**	**3,636**	**100**	**3,736**	**520**	**15**	**535**	**2,625**	**125**	**2,750**	**7,285**
14:30 to 15:30	129	3	**132**	1,136	28	**1,164**	172	3	**175**	1,229	36	**1,265**	**2,736**
14:45 to 15:45	135	2	**137**	1,175	31	**1,206**	177	5	**182**	1,284	30	**1,314**	**2,839**
15:00 to 16:00	119	1	**120**	1,217	35	**1,252**	185	8	**193**	1,282	39	**1,321**	**2,886**
15:15 to 16:15	130	1	**131**	1,188	34	**1,222**	183	7	**190**	1,300	35	**1,335**	**2,878**
15:30 to 16:30	122	2	**124**	1,231	32	**1,263**	181	6	**187**	1,301	33	**1,334**	**2,908**
15:45 to 16:45	116	2	**118**	1,241	34	**1,275**	168	3	**171**	1,300	30	**1,330**	**2,894**
16:00 to 17:00	125	2	**127**	1,269	24	**1,293**	163	0	**163**	1,377	18	**1,395**	**2,978**
16:15 to 17:15	120	2	**122**	1,291	21	**1,312**	153	0	**153**	1,363	15	**1,378**	**2,965**
16:30 to 17:30	117	1	**118**	1,222	20	**1,242**	156	0	**156**	1,372	14	**1,386**	**2,902**
16:45 to 17:45	120	0	**120**	1,159	15	**1,174**	171	0	**171**	1,335	14	**1,349**	**2,814**
17:00 to 18:00	114	0	**114**	1,021	16	**1,037**	156	0	**156**	1,278	14	**1,292**	**2,599**
17:15 to 18:15	114	0	**114**	926	13	**939**	149	0	**149**	1,194	13	**1,207**	**2,409**
17:30 to 18:30	101	0	**101**	793	17	**810**	141	0	**141**	1,058	8	**1,066**	**2,118**
PM Totals	**469**	**6**	**475**	**4,382**	**97**	**4,479**	**650**	**9**	**659**	**4,960**	**91**	**5,051**	**10,664**

Job No. : AUQLD3388
Client : Lambert & Rehbein (SEQ) Pty Ltd
Suburb : Cleveland
Location : 2. Finucane Rd / Dawson Rd

Day/Date : Tue, 29 Mar 2022
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary



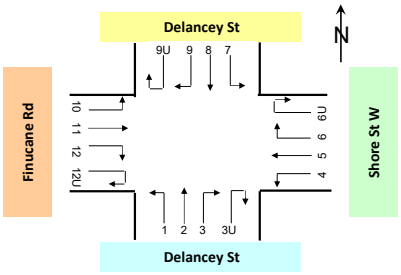
MATRIX Traffic and Transport Data

	Approach		Finucane Rd			Dawson Rd			Finucane Rd			Grand Total
	Time Period		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
AM	7:45 to 8:45		1,501	41	**1,542**	97	4	**101**	1,431	51	**1,482**	**3,125**
PM	16:00 to 17:00		1,372	30	**1,402**	53	1	**54**	1,450	12	**1,462**	**2,918**

Approach		Finucane Rd			Dawson Rd			Finucane Rd			Grand Total
Time Period		Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
6:00 to 7:00		1,009	26	**1,035**	51	2	**53**	624	33	**657**	**1,745**
6:15 to 7:15		1,148	25	**1,173**	60	2	**62**	674	40	**714**	**1,949**
6:30 to 7:30		1,209	33	**1,242**	60	3	**63**	771	34	**805**	**2,110**
6:45 to 7:45		1,229	36	**1,265**	66	2	**68**	869	41	**910**	**2,243**
7:00 to 8:00		1,299	35	**1,334**	78	1	**79**	1,041	50	**1,091**	**2,504**
7:15 to 8:15		1,340	43	**1,383**	90	1	**91**	1,269	46	**1,315**	**2,789**
7:30 to 8:30		1,412	39	**1,451**	102	2	**104**	1,380	57	**1,437**	**2,992**
7:45 to 8:45		1,501	41	**1,542**	97	4	**101**	1,431	51	**1,482**	**3,125**
8:00 to 9:00		1,483	52	**1,535**	93	5	**98**	1,364	44	**1,408**	**3,041**
AM Totals		**3,791**	**113**	**3,904**	**222**	**8**	**230**	**3,029**	**127**	**3,156**	**7,290**
14:30 to 15:30		1,266	32	**1,298**	53	2	**55**	1,430	39	**1,469**	**2,822**
14:45 to 15:45		1,323	42	**1,365**	55	4	**59**	1,414	40	**1,454**	**2,878**
15:00 to 16:00		1,280	45	**1,325**	54	3	**57**	1,439	37	**1,476**	**2,858**
15:15 to 16:15		1,358	44	**1,402**	51	3	**54**	1,411	36	**1,447**	**2,903**
15:30 to 16:30		1,339	45	**1,384**	59	3	**62**	1,356	29	**1,385**	**2,831**
15:45 to 16:45		1,356	35	**1,391**	51	1	**52**	1,418	19	**1,437**	**2,880**
16:00 to 17:00		1,372	30	**1,402**	53	1	**54**	1,450	12	**1,462**	**2,918**
16:15 to 17:15		1,285	25	**1,310**	57	2	**59**	1,457	11	**1,468**	**2,837**
16:30 to 17:30		1,277	19	**1,296**	55	3	**58**	1,462	11	**1,473**	**2,827**
16:45 to 17:45		1,158	18	**1,176**	63	3	**66**	1,383	14	**1,397**	**2,639**
17:00 to 18:00		1,071	14	**1,085**	64	4	**68**	1,343	13	**1,356**	**2,509**
17:15 to 18:15		962	18	**980**	55	3	**58**	1,228	10	**1,238**	**2,276**
17:30 to 18:30		845	16	**861**	58	3	**61**	1,103	10	**1,113**	**2,035**
PM Totals		**4,727**	**112**	**4,839**	**225**	**11**	**236**	**5,351**	**89**	**5,440**	**10,515**

Job No. : AUQLD3388
Client : Lambert & Rehbein (SEQ) Pty Ltd
Suburb : Cleveland
Location : 3. Finucane Rd / Delancey St / Shore St W

Day/Date : Tue, 29 Mar 2022
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary



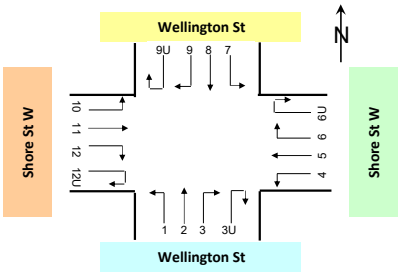
MATRIX Traffic and Transport Data

	Approach	Delancey St			Shore St W			Delancey St			Finucane Rd			Grand Total
	Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
AM	7:45 to 8:45	727	10	**737**	890	32	**922**	511	11	**522**	1,492	53	**1,545**	**3,726**
PM	16:00 to 17:00	652	10	**662**	859	18	**877**	417	3	**420**	1,443	13	**1,456**	**3,415**

Approach	Delancey St			Shore St W			Delancey St			Finucane Rd			Grand Total
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
6:00 to 7:00	434	8	**442**	554	12	**566**	152	4	**156**	643	30	**673**	**1,837**
6:15 to 7:15	479	9	**488**	666	16	**682**	191	5	**196**	719	43	**762**	**2,128**
6:30 to 7:30	498	11	**509**	695	24	**719**	240	5	**245**	820	35	**855**	**2,328**
6:45 to 7:45	556	15	**571**	707	22	**729**	260	5	**265**	932	40	**972**	**2,537**
7:00 to 8:00	606	13	**619**	733	26	**759**	339	5	**344**	1,097	52	**1,149**	**2,871**
7:15 to 8:15	673	15	**688**	746	27	**773**	410	8	**418**	1,309	43	**1,352**	**3,231**
7:30 to 8:30	711	12	**723**	805	25	**830**	483	10	**493**	1,454	56	**1,510**	**3,556**
7:45 to 8:45	727	10	**737**	890	32	**922**	511	11	**522**	1,492	53	**1,545**	**3,726**
8:00 to 9:00	706	14	**720**	879	36	**915**	492	13	**505**	1,422	47	**1,469**	**3,609**
AM Totals	**1,746**	**35**	**1,781**	**2,166**	**74**	**2,240**	**983**	**22**	**1,005**	**3,162**	**129**	**3,291**	**8,317**
14:30 to 15:30	583	8	**591**	837	27	**864**	366	6	**372**	1,437	39	**1,476**	**3,303**
14:45 to 15:45	606	13	**619**	805	30	**835**	447	10	**457**	1,426	40	**1,466**	**3,377**
15:00 to 16:00	604	11	**615**	786	28	**814**	476	12	**488**	1,444	41	**1,485**	**3,402**
15:15 to 16:15	670	10	**680**	785	27	**812**	439	12	**451**	1,420	37	**1,457**	**3,400**
15:30 to 16:30	642	12	**654**	794	24	**818**	428	12	**440**	1,396	33	**1,429**	**3,341**
15:45 to 16:45	678	11	**689**	830	18	**848**	384	6	**390**	1,442	22	**1,464**	**3,391**
16:00 to 17:00	652	10	**662**	859	18	**877**	417	3	**420**	1,443	13	**1,456**	**3,415**
16:15 to 17:15	579	9	**588**	849	14	**863**	437	1	**438**	1,470	12	**1,482**	**3,371**
16:30 to 17:30	570	7	**577**	857	13	**870**	429	3	**432**	1,448	12	**1,460**	**3,339**
16:45 to 17:45	490	3	**493**	780	14	**794**	389	4	**393**	1,399	16	**1,415**	**3,095**
17:00 to 18:00	453	1	**454**	712	13	**725**	335	5	**340**	1,354	16	**1,370**	**2,889**
17:15 to 18:15	409	1	**410**	641	15	**656**	296	6	**302**	1,239	14	**1,253**	**2,621**
17:30 to 18:30	355	3	**358**	568	12	**580**	257	3	**260**	1,140	11	**1,151**	**2,349**
PM Totals	**2,150**	**30**	**2,180**	**3,056**	**76**	**3,132**	**1,480**	**24**	**1,504**	**5,421**	**95**	**5,516**	**12,332**

Job No. : AUQLD3388
Client : Lambert & Rehbein (SEQ) Pty Ltd
Suburb : Cleveland
Location : 4. Shore St W / Wellington St

Day/Date : Tue, 29 Mar 2022
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary



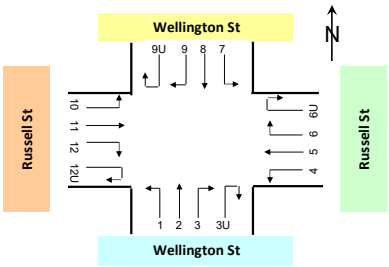
MATRIX Traffic and Transport Data

	Approach	Wellington St			Shore St W			Wellington St			Shore St W			Grand Total
	Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
AM	8:00 to 9:00	589	33	**622**	938	32	**970**	823	19	**842**	1,119	30	**1,149**	**3,583**
PM	16:15 to 17:15	619	8	**627**	1,011	21	**1,032**	603	9	**612**	1,068	9	**1,077**	**3,348**

Approach	Wellington St			Shore St W			Wellington St			Shore St W			Grand Total
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
6:00 to 7:00	283	28	**311**	514	15	**529**	366	4	**370**	423	26	**449**	**1,659**
6:15 to 7:15	325	19	**344**	567	14	**581**	420	4	**424**	467	33	**500**	**1,849**
6:30 to 7:30	349	25	**374**	628	19	**647**	495	3	**498**	550	36	**586**	**2,105**
6:45 to 7:45	395	26	**421**	674	20	**694**	561	9	**570**	641	33	**674**	**2,359**
7:00 to 8:00	424	26	**450**	717	20	**737**	614	13	**627**	763	41	**804**	**2,618**
7:15 to 8:15	458	27	**485**	763	26	**789**	697	16	**713**	896	41	**937**	**2,924**
7:30 to 8:30	507	27	**534**	836	23	**859**	738	20	**758**	1,026	34	**1,060**	**3,211**
7:45 to 8:45	561	30	**591**	892	25	**917**	811	19	**830**	1,118	38	**1,156**	**3,494**
8:00 to 9:00	589	33	**622**	938	32	**970**	823	19	**842**	1,119	30	**1,149**	**3,583**
AM Totals	**1,296**	**87**	**1,383**	**2,169**	**67**	**2,236**	**1,803**	**36**	**1,839**	**2,305**	**97**	**2,402**	**7,860**
14:30 to 15:30	550	21	**571**	914	24	**938**	610	17	**627**	975	31	**1,006**	**3,142**
14:45 to 15:45	561	16	**577**	895	21	**916**	631	17	**648**	1,090	25	**1,115**	**3,256**
15:00 to 16:00	555	15	**570**	864	19	**883**	671	19	**690**	1,105	30	**1,135**	**3,278**
15:15 to 16:15	586	12	**598**	829	16	**845**	698	20	**718**	1,106	25	**1,131**	**3,292**
15:30 to 16:30	605	12	**617**	856	14	**870**	674	17	**691**	1,112	26	**1,138**	**3,316**
15:45 to 16:45	614	13	**627**	955	20	**975**	655	14	**669**	1,013	23	**1,036**	**3,307**
16:00 to 17:00	636	10	**646**	979	20	**999**	629	12	**641**	1,018	12	**1,030**	**3,316**
16:15 to 17:15	619	8	**627**	1,011	21	**1,032**	603	9	**612**	1,068	9	**1,077**	**3,348**
16:30 to 17:30	598	6	**604**	984	21	**1,005**	618	8	**626**	1,087	9	**1,096**	**3,331**
16:45 to 17:45	601	4	**605**	918	20	**938**	610	5	**615**	1,078	10	**1,088**	**3,246**
17:00 to 18:00	554	7	**561**	840	16	**856**	608	4	**612**	1,055	12	**1,067**	**3,096**
17:15 to 18:15	515	8	**523**	755	16	**771**	617	4	**621**	973	12	**985**	**2,900**
17:30 to 18:30	479	5	**484**	680	14	**694**	551	3	**554**	905	9	**914**	**2,646**
PM Totals	**2,232**	**44**	**2,276**	**3,434**	**73**	**3,507**	**2,453**	**45**	**2,498**	**4,079**	**75**	**4,154**	**12,435**

Job No. : AUQLD3388
Client : Lambert & Rehbein (SEQ) Pty Ltd
Suburb : Cleveland
Location : 5. Wellington St / Russell St

Day/Date : Tue, 29 Mar 2022
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary



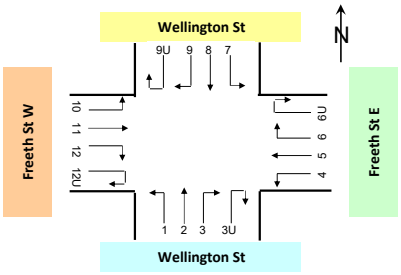
MATRIX Traffic and Transport Data

	Approach	Wellington St			Russell St			Wellington St			Russell St			Grand Total
	Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
AM	7:45 to 8:45	713	23	**736**	497	9	**506**	622	27	**649**	447	10	**457**	**2,348**
PM	16:00 to 17:00	742	9	**751**	361	7	**368**	566	12	**578**	519	4	**523**	**2,220**

Approach	Wellington St			Russell St			Wellington St			Russell St			Grand Total
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
6:00 to 7:00	442	25	**467**	208	3	**211**	380	17	**397**	148	4	**152**	**1,227**
6:15 to 7:15	482	17	**499**	239	5	**244**	374	15	**389**	191	4	**195**	**1,327**
6:30 to 7:30	530	18	**548**	246	5	**251**	445	9	**454**	227	4	**231**	**1,484**
6:45 to 7:45	556	26	**582**	252	3	**255**	500	7	**507**	252	3	**255**	**1,599**
7:00 to 8:00	586	24	**610**	308	5	**313**	563	12	**575**	274	2	**276**	**1,774**
7:15 to 8:15	641	22	**663**	358	4	**362**	630	18	**648**	320	3	**323**	**1,996**
7:30 to 8:30	665	26	**691**	422	7	**429**	631	21	**652**	386	6	**392**	**2,164**
7:45 to 8:45	713	23	**736**	497	9	**506**	622	27	**649**	447	10	**457**	**2,348**
8:00 to 9:00	715	24	**739**	491	9	**500**	578	28	**606**	440	11	**451**	**2,296**
AM Totals	**1,743**	**73**	**1,816**	**1,007**	**17**	**1,024**	**1,521**	**57**	**1,578**	**862**	**17**	**879**	**5,297**
14:30 to 15:30	653	22	**675**	335	4	**339**	519	28	**547**	399	11	**410**	**1,971**
14:45 to 15:45	692	18	**710**	355	6	**361**	534	26	**560**	403	10	**413**	**2,044**
15:00 to 16:00	683	17	**700**	344	5	**349**	559	24	**583**	414	11	**425**	**2,057**
15:15 to 16:15	753	14	**767**	335	4	**339**	581	20	**601**	437	12	**449**	**2,156**
15:30 to 16:30	757	14	**771**	345	6	**351**	587	18	**605**	464	8	**472**	**2,199**
15:45 to 16:45	746	14	**760**	340	6	**346**	594	13	**607**	479	7	**486**	**2,199**
16:00 to 17:00	742	9	**751**	361	7	**368**	566	12	**578**	519	4	**523**	**2,220**
16:15 to 17:15	692	7	**699**	329	7	**336**	592	8	**600**	542	2	**544**	**2,179**
16:30 to 17:30	675	5	**680**	296	5	**301**	589	8	**597**	540	2	**542**	**2,120**
16:45 to 17:45	626	4	**630**	280	2	**282**	565	8	**573**	511	2	**513**	**1,998**
17:00 to 18:00	593	6	**599**	232	1	**233**	550	8	**558**	478	2	**480**	**1,870**
17:15 to 18:15	583	6	**589**	209	1	**210**	515	7	**522**	439	2	**441**	**1,762**
17:30 to 18:30	530	6	**536**	192	1	**193**	491	5	**496**	386	3	**389**	**1,614**
PM Totals	**2,615**	**47**	**2,662**	**1,168**	**16**	**1,184**	**2,186**	**59**	**2,245**	**1,789**	**24**	**1,813**	**7,904**

Job No. : AUQLD3388
Client : Lambert & Rehbein (SEQ) Pty Ltd
Suburb : Cleveland
Location : 6. Wellington St / Freeth St

Day/Date : Tue, 29 Mar 2022
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary



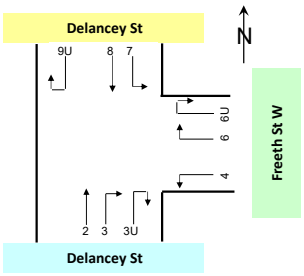
MATRIX Traffic and Transport Data

	Approach	Wellington St			Freeth St E			Wellington St			Freeth St W			Grand Total
	Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
AM	7:45 to 8:45	563	17	**580**	4	0	**4**	684	11	**695**	212	7	**219**	**1,498**
PM	15:30 to 16:30	728	7	**735**	39	0	**39**	524	15	**539**	162	2	**164**	**1,477**

Approach	Wellington St			Freeth St E			Wellington St			Freeth St W			Grand Total
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
6:00 to 7:00	310	15	**325**	0	0	**0**	358	2	**360**	45	1	**46**	**731**
6:15 to 7:15	346	18	**364**	3	0	**3**	418	1	**419**	62	1	**63**	**849**
6:30 to 7:30	392	19	**411**	6	0	**6**	473	3	**476**	72	1	**73**	**966**
6:45 to 7:45	439	23	**462**	6	0	**6**	530	7	**537**	73	1	**74**	**1,079**
7:00 to 8:00	462	20	**482**	6	0	**6**	589	12	**601**	102	2	**104**	**1,193**
7:15 to 8:15	508	17	**525**	5	0	**5**	624	13	**637**	123	1	**124**	**1,291**
7:30 to 8:30	553	16	**569**	2	0	**2**	680	12	**692**	167	6	**173**	**1,436**
7:45 to 8:45	563	17	**580**	4	0	**4**	684	11	**695**	212	7	**219**	**1,498**
8:00 to 9:00	557	18	**575**	4	0	**4**	637	12	**649**	214	7	**221**	**1,449**
AM Totals	**1,329**	**53**	**1,382**	**10**	**0**	**10**	**1,584**	**26**	**1,610**	**361**	**10**	**371**	**3,373**
14:30 to 15:30	648	11	**659**	8	1	**9**	552	14	**566**	136	3	**139**	**1,373**
14:45 to 15:45	655	9	**664**	9	1	**10**	547	17	**564**	165	3	**168**	**1,406**
15:00 to 16:00	667	9	**676**	19	0	**19**	575	19	**594**	164	2	**166**	**1,455**
15:15 to 16:15	714	7	**721**	34	0	**34**	538	15	**553**	159	2	**161**	**1,469**
15:30 to 16:30	728	7	**735**	39	0	**39**	524	15	**539**	162	2	**164**	**1,477**
15:45 to 16:45	749	7	**756**	39	0	**39**	522	12	**534**	140	2	**142**	**1,471**
16:00 to 17:00	743	6	**749**	32	0	**32**	504	9	**513**	125	2	**127**	**1,421**
16:15 to 17:15	769	6	**775**	14	0	**14**	524	8	**532**	142	2	**144**	**1,465**
16:30 to 17:30	761	6	**767**	10	0	**10**	537	3	**540**	129	1	**130**	**1,447**
16:45 to 17:45	768	5	**773**	9	0	**9**	503	2	**505**	112	1	**113**	**1,400**
17:00 to 18:00	739	7	**746**	15	0	**15**	515	2	**517**	117	1	**118**	**1,396**
17:15 to 18:15	665	7	**672**	25	0	**25**	470	0	**470**	86	1	**87**	**1,254**
17:30 to 18:30	629	7	**636**	25	0	**25**	423	0	**423**	80	1	**81**	**1,165**
PM Totals	**2,766**	**31**	**2,797**	**82**	**1**	**83**	**2,036**	**32**	**2,068**	**507**	**7**	**514**	**5,462**

Job No. : AUQLD3388
Client : Lambert & Rehbein (SEQ) Pty Ltd
Suburb : Cleveland
Location : 7. Freeth St W / Delancey St

Day/Date : Tue, 29 Mar 2022
Weather : Fine
Description : Classified Intersection Count
: Peak Hour Summary

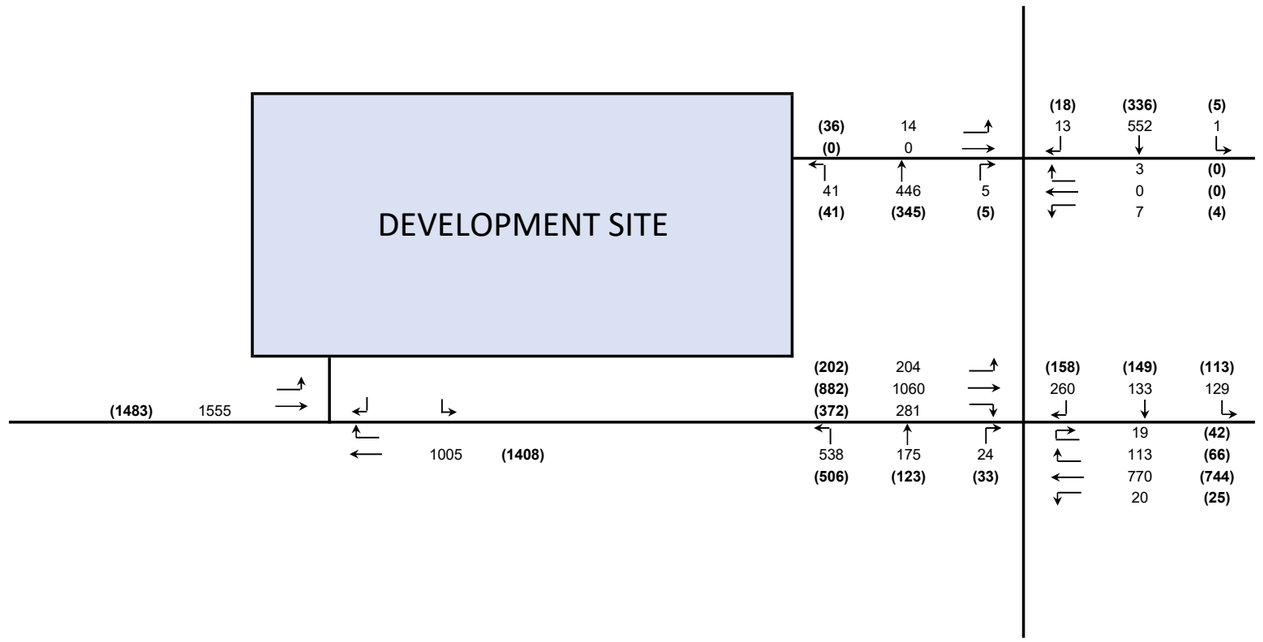


MATRIX Traffic and Transport Data

	Approach	Delancey St			Freeth St W			Delancey St				Grand Total
	Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total		
AM	7:45 to 8:45	438	17	**455**	182	3	**185**	596	12	**608**		1,248
PM	14:45 to 15:45	440	11	**451**	167	6	**173**	386	8	**394**		1,018

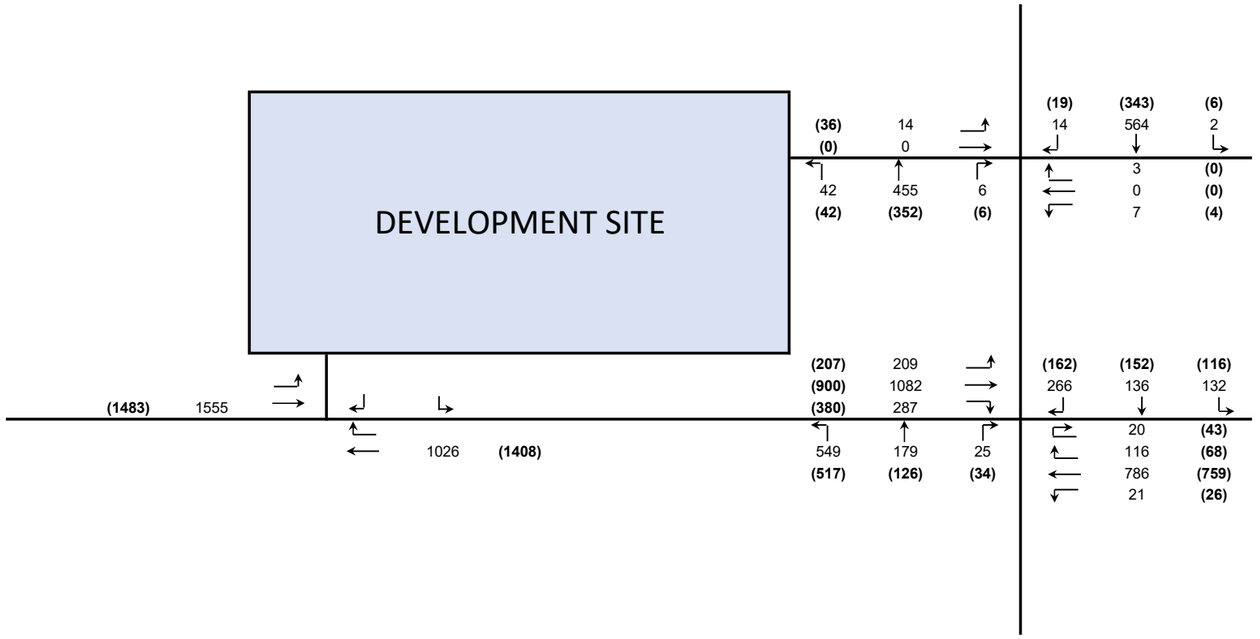
Approach	Delancey St			Freeth St W			Delancey St				Grand Total
Time Period	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total		
6:00 to 7:00	101	0	**101**	58	3	**61**	159	3	**162**		324
6:15 to 7:15	134	2	**136**	80	3	**83**	205	2	**207**		426
6:30 to 7:30	149	3	**152**	90	2	**92**	250	2	**252**		496
6:45 to 7:45	184	4	**188**	103	2	**105**	282	3	**285**		578
7:00 to 8:00	231	8	**239**	126	2	**128**	344	3	**347**		714
7:15 to 8:15	318	9	**327**	139	3	**142**	401	4	**405**		874
7:30 to 8:30	404	14	**418**	160	3	**163**	496	11	**507**		1,088
7:45 to 8:45	438	17	**455**	182	3	**185**	596	12	**608**		1,248
8:00 to 9:00	426	15	**441**	173	4	**177**	571	12	**583**		1,201
AM Totals	**758**	**23**	**781**	**357**	**9**	**366**	**1,074**	**18**	1,092		2,239
14:30 to 15:30	412	9	**421**	164	5	**169**	292	4	**296**		886
14:45 to 15:45	440	11	**451**	167	6	**173**	386	8	**394**		1,018
15:00 to 16:00	387	10	**397**	150	8	**158**	441	8	**449**		1,004
15:15 to 16:15	369	10	**379**	143	6	**149**	396	10	**406**		934
15:30 to 16:30	356	9	**365**	132	3	**135**	388	11	**399**		899
15:45 to 16:45	363	6	**369**	150	2	**152**	345	5	**350**		871
16:00 to 17:00	378	4	**382**	153	0	**153**	352	4	**356**		891
16:15 to 17:15	377	3	**380**	155	0	**155**	389	1	**390**		925
16:30 to 17:30	379	4	**383**	174	2	**176**	375	3	**378**		937
16:45 to 17:45	346	5	**351**	170	2	**172**	316	4	**320**		843
17:00 to 18:00	320	6	**326**	176	3	**179**	273	4	**277**		782
17:15 to 18:15	286	6	**292**	165	3	**168**	239	5	**244**		704
17:30 to 18:30	243	4	**247**	139	1	**140**	202	2	**204**		591
PM Totals	**1,390**	**26**	1,416	**609**	**11**	**620**	**1,257**	**20**	1,277		3,313

APPENDIX C- TRAFFIC MOVEMENT DIAGRAMS



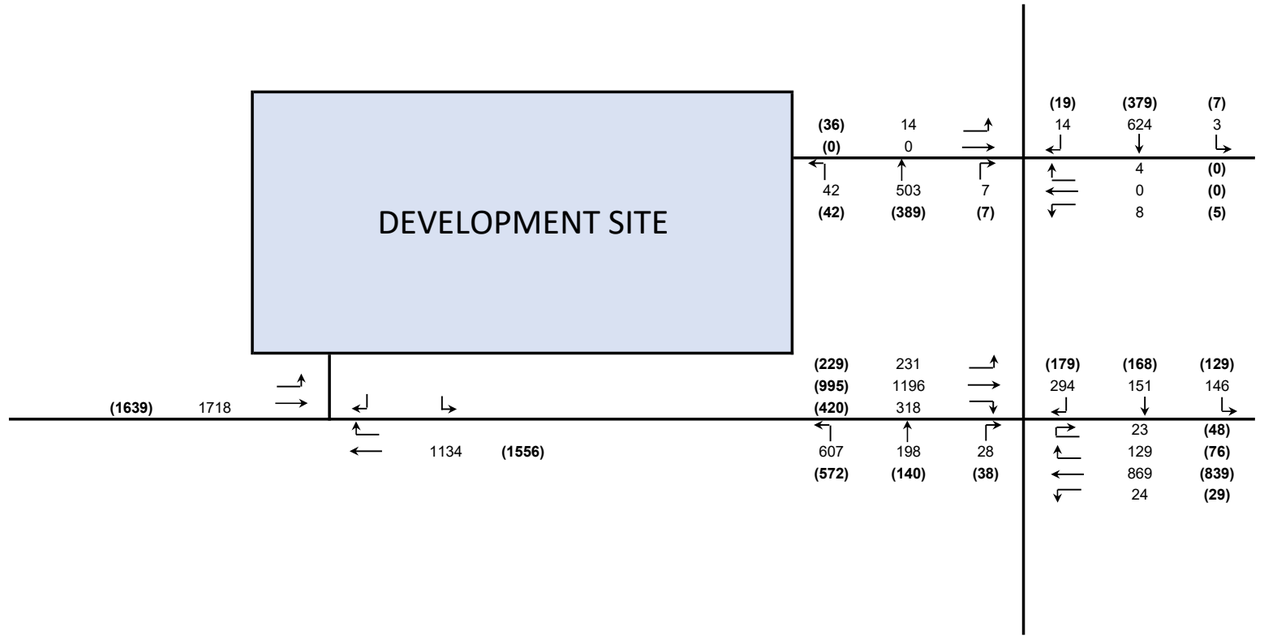
All Vehicles
Weekday AM
Peak Period 7:45 AM to 8:45 AM
(Weekday PM)
Peak Period 4:00 PM to 5:00 PM

Project Number:	B19590	Title:				Figure Number:
Project Name:	Proposed Industrial Development	**Background Traffic**	LAMBERT & REHBEIN ENGINEERS · MANAGERS · SCIENTISTS			C1
Address:	58 - 68 Delancey Street, Ormiston QLD 4160	**2022**			A 7/11/2022	
Client:	Cleveland Rural Pty Ltd C/- Steve Lambourne		Prepared: CT	Approved: SW	Rev: Date:	



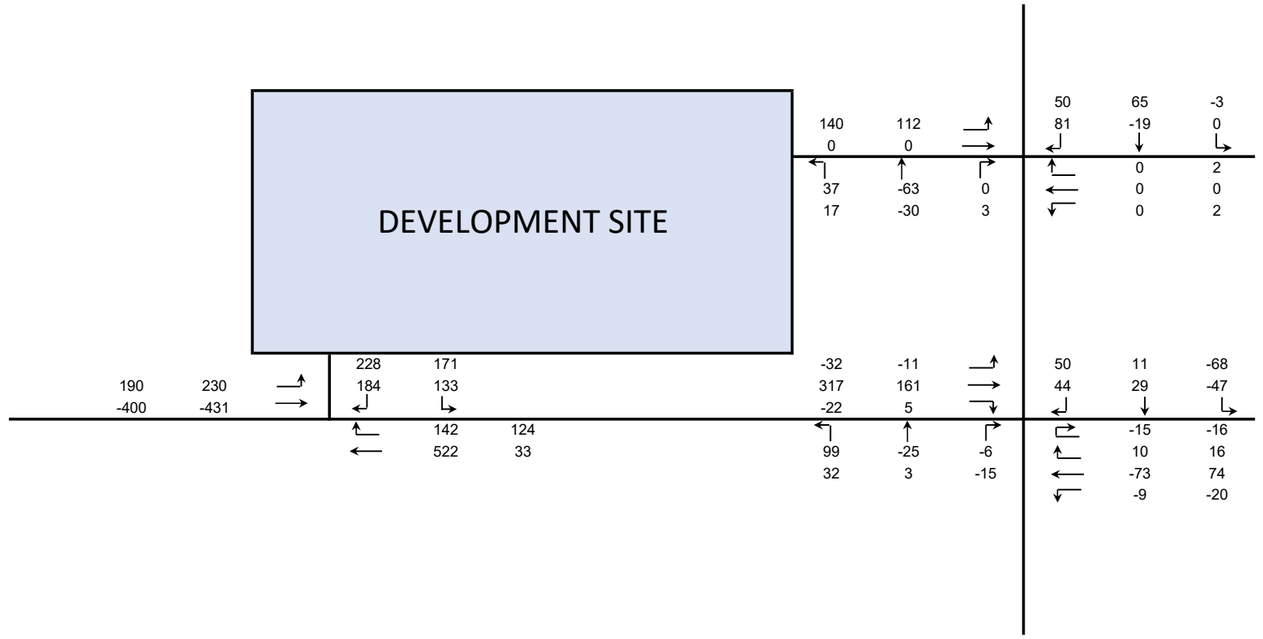
All Vehicles
Weekday AM
Peak Period 7:45 AM to 8:45 AM
(Weekday PM)
Peak Period 4:00 PM to 5:00 PM

Project Number:	B19590	Title:				Figure Number:
Project Name:	Proposed Industrial Development	**Background Traffic**	LAMBERT & REHBEIN ENGINEERS · MANAGERS · SCIENTISTS			
Address:	58 - 68 Delancey Street, Ormiston QLD 4160	**2024**			A 7/11/2022	C2
Client:	Cleveland Rural Pty Ltd C/- Steve Lambourne		Prepared: CT	Approved: SW	Rev: Date:	



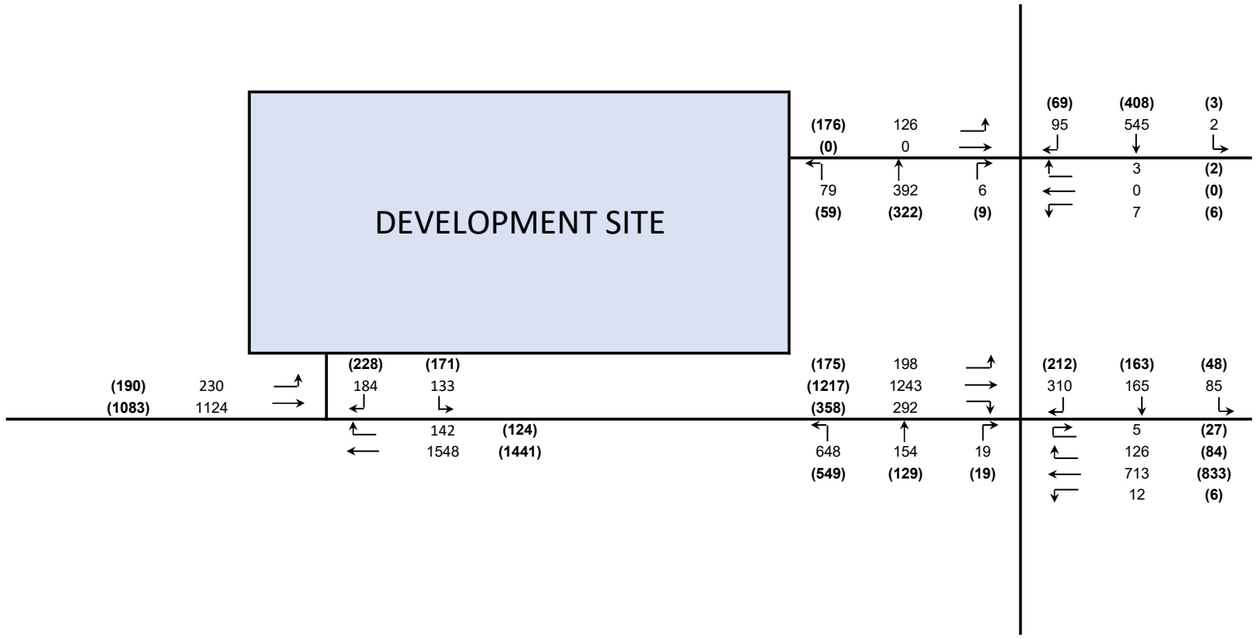
All Vehicles
Weekday AM
Peak Period 7:45 AM to 8:45 AM
(Weekday PM)
Peak Period 4:00 PM to 5:00 PM

Project Number:	B19590	Title:					Figure Number:
Project Name:	Proposed Industrial Development	**Background Traffic**	LAMBERT & REHBEIN ENGINEERS · MANAGERS · SCIENTISTS				
Address:	58 - 68 Delancey Street, Ormiston QLD 4160	**2034**			A	7/11/2022	C3
Client:	Cleveland Rural Pty Ltd C/- Steve Lambourne		Prepared: CT	Approved: SW	Rev:	Date:	



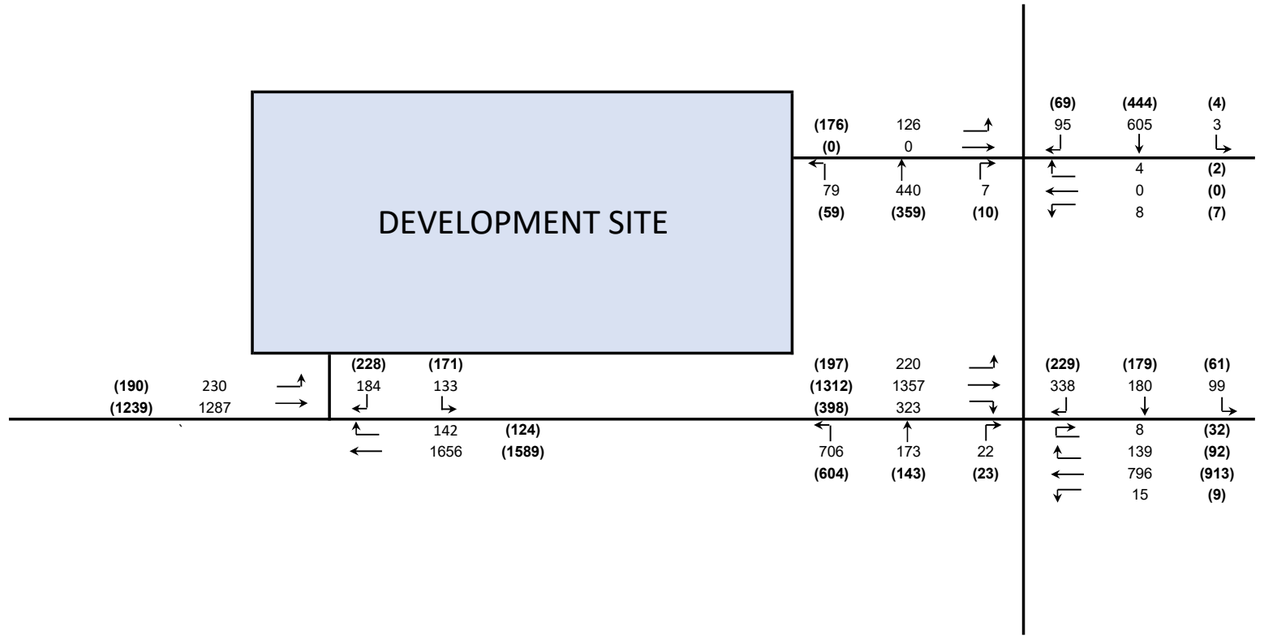
All Vehicles
Weekday AM
Peak Period 7:45 AM to 8:45 AM
(Weekday PM)
Peak Period 4:00 PM to 5:00 PM

Project Number:	B19590	Title:					Figure Number:
Project Name:	Proposed Industrial Development	**Development traffic**	LAMBERT & REHBEIN ENGINEERS · MANAGERS · SCIENTISTS				
Address:	58 - 68 Delancey Street, Ormiston QLD 4160	**(microsim design volumes minus background)**				A 7/11/2022	C4
Client:	Cleveland Rural Pty Ltd C/- Steve Lambourne		Prepared: CT		Approved: SW	Rev: Date:	



All Vehicles
Weekday AM
Peak Period 7:45 AM to 8:45 AM
(Weekday PM)
Peak Period 4:00 PM to 5:00 PM

Project Number:	B19590	Title:					Figure Number:
Project Name:	Proposed Industrial Development	**Design traffic (Microsim Modelling Outputs)**	LAMBERT & REHBEIN ENGINEERS · MANAGERS · SCIENTISTS				
Address:	58 - 68 Delancey Street, Ormiston QLD 4160	**2024**				A 7/11/2022	C5
Client:	Cleveland Rural Pty Ltd C/- Steve Lambourne		Prepared: CT		Approved: SW	Rev: Date:	



All Vehicles
Weekday AM
Peak Period 7:45 AM to 8:45 AM
(Weekday PM)
Peak Period 4:00 PM to 5:00 PM

Project Number:	B19590	Title:				Figure Number:
Project Name:	Proposed Industrial Development	**Design traffic (Based on Microsim Modelling Outputs)**	LAMBERT & REHBEIN ENGINEERS · MANAGERS · SCIENTISTS			C6
Address:	58 - 68 Delancey Street, Ormiston QLD 4160	**2034**			A 7/11/2022	
Client:	Cleveland Rural Pty Ltd C/- Steve Lambourne		Prepared: CT	Approved: SW	Rev: Date:	

APPENDIX D- MICRO SIMLUATION MODELLING REPORT

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PRIVATE HOSPITAL FINUCANE ROAD – ACCESS ANALYSIS

Micro-simulation modelling

Analysis of the traffic impacts of a proposed private hospital with access onto Finucane Road, Cleveland

Charles Reeler

Version 1

8/07/2022

Prepared by Adanner Pty Ltd for [insert client name]

Report version control

Version	Date	Author	Change Description
1	8/07/2022	Charles Reeler	DRAFT
2	8/07/2022	Charles Reeler	FINAL

TABLE OF CONTENTS

1 BACKGROUND

A private hospital with mixed-use development has been proposed to be developed on the corner of Finucane Road and Delancey Street in Cleveland. There is an existing access on Delancey Street servicing the current development however with further development of this site this existing access will be inadequate for the predicted traffic demands.

A second access to the development site is therefore proposed on Finucane Road to meet the increased traffic demands to and from the site.

The purpose of this document is to provide the results of an assessment of the traffic impacts of proposed development at the new Finucane Road access, the impact of the development on the surrounding road network and to identify mitigating measures to address the increased traffic demands.

This report documents the findings of the micro-simulation modelling carried out for this investigation.

2 METHODOLOGY

2.1 Study Area

Figure 1 shows the site of the private hospital and proposed mixed development and the surrounding road network that has been included in the simulation modelling.

The study area extends from McDonald Road in the west to Wellington Street in the east and from Russel Street in the south to Freeth Street in the north. Seven intersections are included in the study are as shown in the figure below.

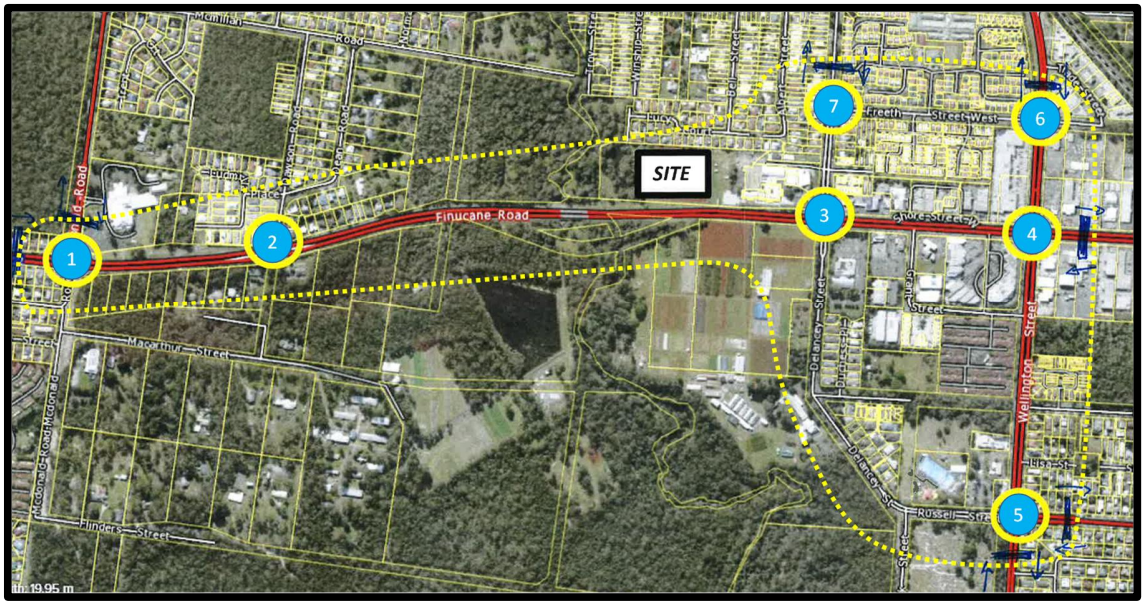


Figure 1 Study Area

The intersections included in the models are:

1. Finucane Road / McDonald Road
2. Finucane Road / Dawson Road
3. Finucane Road / Delancey Street
4. Finucane Road / Wellington Street
5. Wellington Street / Russel Street
6. Wellington Street / Freeth Street
7. Delancey Street / Freeth Street

The development site is located in the north west corner of the intersection of Finucane Road and Delancey Street. There is an existing access to the current site off Delancey Street opposite the Arthur Street intersection. The new second access is proposed off Finucane Road at the western end of the development site as shown below (site dimensions and access location – not to scale).

Figure 2 Site Location and Accesses

2.2 Proposed Land Use and Trip Generation

Previous studies investigating the proposed development and accesses have been carried out by Lambert & Rehbein (L&R). These studies include detailed trip generation rates for the development as well as assignment to and from the development site for the weekday AM and PM peak periods. These assumptions are documented in the L&R document titled: "Technical Note – Proposed Hospital ad Mixed Use Development, Cnr Finucane Road & Delancey Street, Qld 4160, Access Intersection Analysis", dated 10/11/2021.

For the purposes of this analysis, the same trip generation and assignment assumptions have been assumed (albeit with slight changes as described in the following sections). In summary the proposed development mix is presented in the following table (extract from the L&R document):

USE	YIELD	
PRIVATE HOSPITAL	148 BEDS + 14 THEATRES	22,411 m^2 GFA
DAY SURGERY	18 Day Beds	
MEDICAL SPECIALISTS IN CONSULTING SUITES BLDG	-	4,614 m^2 GFA
CHILD CARE	150 PLACES	1,200 m^2 GFA
SPECIAL RETAIL	-	6,213 m^2 GFA
RESEARCH INSTITUTE	-	4,407 m^2 GFA
ASSISTED LIVING UNIT & FACILITIES	200 UNITS + FACILITIES	25,000 m^2 GFA
AGED CARE	134 BEDS + Ancillary Area	11,163 m^2 GFA
COMMUNITY HUB	-	2,000 m^2 GFA
TOTAL		**77,008 m^2 GFA**

Table 1 Proposed Development Yields

Based on these yields the trip generation for the development was estimated using the trip generation rates and directionality as shown in the following table.

LAND USE	GENERATION RATE		DIRECTIONALITY (% IN / % OUT)		SOURCE
	AM Peak	PM Peak	AM Peak	PM Peak	
PRIVATE HOSPITAL	-22.07 trips +1.04 trips x beds	-22.07 trips +1.04 trips x beds	50% in / 50% out	50% in / 50% out	RMS (formally RTA)
DAY SURGERY					
MEDICAL SPECIALISTS IN CONSULTING SUITES BLDG	9.81 trips / 100m^2 GFA	5.80 trips / 100m^2 GFA	50% in / 50% out	50% in / 50% out	DTMR Open Source Data
CHILD CARE	0.8 trips / child	0.7 trips / child	50% in / 50% out	50% in / 50% out	RMS (formally RTA)
SPECIAL RETAIL	2.8 trips / 100m^2 GFA	5.6 trips / 100m^2 GFA	50% in / 50% out	50% in / 50% out	RMS (formally RTA)
RESEARCH INSTITUTE	2 trips / 100m^2 GFA	2 trips / 100m^2 GFA	90% in / 10% out	10% in / 90% out	RMS (formally RTA)
ASSISTED LIVING UNIT & FACILITIES	0.2 trips per dwelling	0.2 trips per dwelling	80% in / 20% out	20% in / 80% out	RMS (formally RTA)
AGED CARE	0.2 trips per dwelling	0.2 trips per dwelling	80% in / 20% out	20% in / 80% out	RMS (formally RTA)

Table 2 Trip Generation and Directionality Rates

With these laned uses and trip generation assumptions, the trip generation of the development was determined as follows:

LAND USE	YIELD	AM(IN)	AM (OUT)	PM (IN)	PM (OUT)
PRIVATE HOSPITAL	148 BEDS + 14 THEATRES	75	75	75	75
DAY SURGERY	18 Day Beds				
MEDICAL SPECIALISTS IN CONSULTING SUITES BLDG	4,614 m^2 GFA	226	226	134	134
CHILD CARE	150 PLACES	60	60	53	53
SPECIAL RETAIL	6,213 m^2 GFA	87	87	174	174
RESEARCH INSTITUTE	4,407 m^2 GFA	79	9	9	79
ASSISTED LIVING UNIT & FACILITIES	200 UNITS + FACILITIES	32	8	8	32
AGED CARE	134 BEDS + Ancillary Area	21	5	5	21
COMMUNITY HUB	2,000 m^2 GFA	-	-	-	-
Total Trips per Peak (10% Cross-Utilisation)		**524**	**424**	**412**	**512**

Table 3 Development Traffic Generation

These trips were then assigned with the basic assumptions that the existing access on Delancey Road would attract 20% of the trips and the new Finucane Road access would attract the remaining 80% of the trips.

For the purposes of this micro-simulation analysis these assumptions were slightly modified.

The current access on Delancey Street allows all movements. With the proposed development the movements at this access will change to left-in, left-out and right-in only. No right-turns out of the site onto Delancey Street will be permitted. As a result, the assumption is that vehicles leaving the site and travelling south to Wellington Street and Russell Street will use the main access on Finucane Road.

It was also assumed that vehicles to and from the west on Finucane Road would all use the "Main" access on Finucane Road rather than travel past this access to the access on Delancey Street. Similarly, it was assumed that vehicles to and from Delancey Street (to the north) and Wellington Street (to the north) would all use the Delancey Street access rather than travel past this access to the Finucane Road access. These assumptions are illustrated in the following figures showing the routes to and from the two access points from the various trip generation zones.

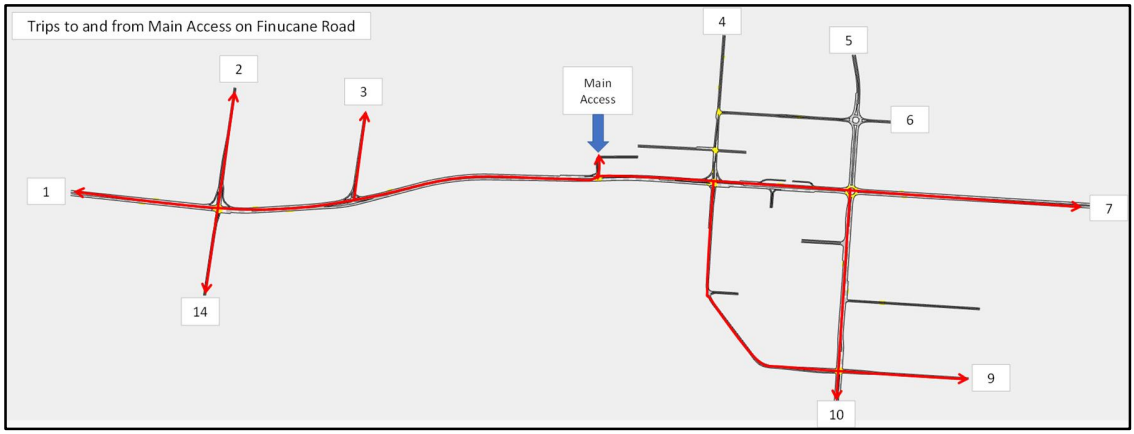


Figure 3 Trips to and from Finucane Road access

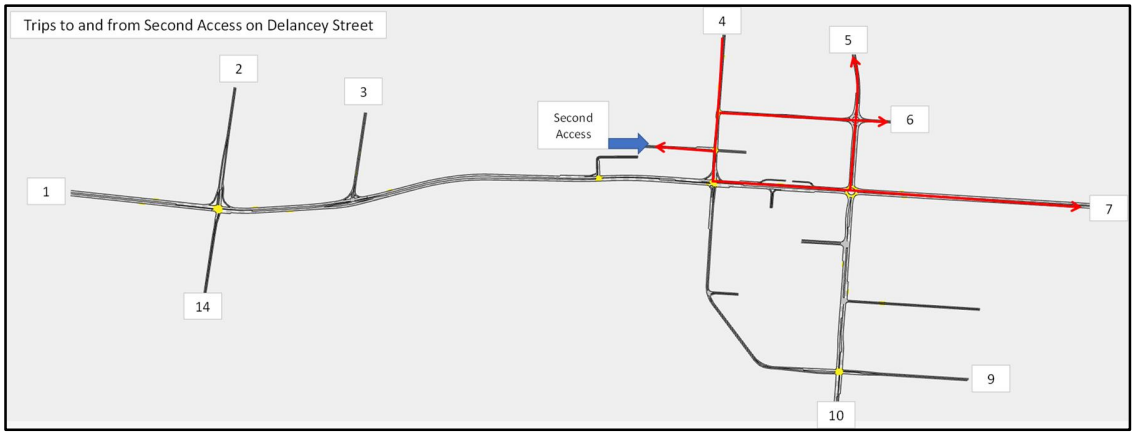


Figure 4 Trips to and from Delancey Street access

With these assumptions the original 80:20 split between the Finucane Road and Delancey Street accesses changed to 77:23.

Directional Split between accesses	Original split		Reassigned split	
	AM	PM	AM	PM
Finucane	80%	80%	77%	77%
Delancey	20%	20%	23%	23%

Table 4 Directional Split of Trips to and from the Development

The trip generation (OD matrices) for this reassignment is shown in more detail in Annexure A.

2.3 Simulation Model Network

As mentioned previously, the study area comprises

- Finucane Road from McDonald Road in the west to Wellington Street in the east

- Wellington Street from Russel Street in the south to Freeth Street in the north
- Delancey Street / Russel Street from Wellington Street in the south to Freeth Street in the north

There are 7 intersections in the network with 11 'external' trip generation zones. Additional zones were added to the network to act as sinks or generators to balance the trips arriving at and departing from the seven intersections where traffic count data is known.

In addition, an 8th intersection was added at the location of the proposed new access to the development on Finucane Road. The development site was also allocated two separate zones, one for the Finucane Road access and one for the Delancey Street access. The full simulation network showing the trip generation zones and the new access is presented in the following figure. Zones 15 and 18 are the zones allocated to the development.

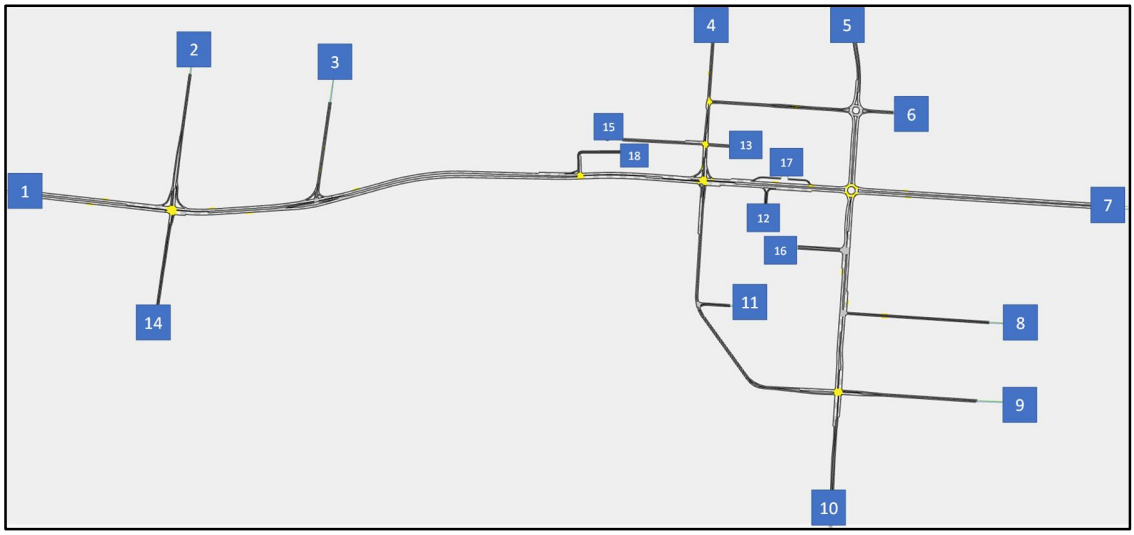


Figure 5 Simulation network and trip generation zones

2.4 Traffic Signal Data

Traffic signal data was provided for the following intersections:

- Finucane Road / McDonald Road
- Finucane Road / Delancey Street
- Wellington Street / Russell Street

The data provided comprised the signal phase sequences and actual timing data (length of time for each phase in May 2022). While the signal phasing data specifies the cycle lengths during the peak periods (160 sec AM peak and 130 sec PM Peak), the actual phase times data varies so that the actual cycle times varied and were not always equal to the stated cycle times.

For the purposes of the modelling, it was therefore assumed that the signals are isolated and operate under actuated control in the Base case models. The limits of the variability of the signal phases were then set to the minimums and maximums as recorded in the data provided.

2.5 Model Software

The simulation software used for this analysis is AIMSUN Next 20 (Version 20). (Note that using a different version of the software may result in slight changes to the results).

2.6 Calibration of 2022 Base Case Models

For this analysis, the Base Model is defined as the 2022 network as the calibration is based on the turn count data collected in March 2022.

The initial demand matrices were derived by assignment of trips between zones using a proportional distribution based on the volumes of attractions and generations to and from each zone. The models were then run to generate modelled turn flows at each intersection which were then compared to the count data. Based on these results, some manual adjustments were made to specific OD pairs so that an acceptable calibration could be achieved. The final manual adjustments included adding trips to and from the internal 'sink' zones. This iterative process was carried out until suitable calibration was achieved.

While route choices in the models are limited, there are certain route choices that required some minor adjustments to the default attributes in the software. Attribute overrides (additional delays) were applied at two locations, namely:

- In the AM Peak at the Wellington / Finucane roundabout (four movements)
- In the AM Peak at the Wellington / Russell intersection (two movements)
- In the PM peak at the Wellington / Finucane and the Wellington / Freeth roundabouts (four movements)
- In the AM Peak at the Wellington / Russell intersection (two movements)

In addition to these changes a number of OD routes were defined to prevent unrealistic route choices:

- Between Finucane east and Finucane west (both directions)
- From Finucane east to Wellington south
- From Finucane east to Russel Street

All models were run for 2 hours (one hour warm-up and the second hour used for all the result reporting). Five seed values were used to replicate the natural variability in daily traffic patterns and all results are based on the average of the five simulation runs. The best calibration was achieved using a proportional distribution whilst allowing on-route path updates using 5-minute calculation intervals.

The criteria for calibration of simulation models are typically based on the R-squared statistic and GEH values (comparison between actual intersection count data and the modelled turn volumes). The calibration criteria with the values from the models is shown in Table 2.

Calibration Criteria	Actual achieved	
	AM	PM
R-squared > 0.9	0.987	0.979
GEH < 5 in at least 85% of observations	93%	94%

Table 5 Calibration Criteria

2.6.1 R-Squared

The R-squared statistic is presented in the following graphs showing the goodness of fit between the intersection counts and the modelled turn volumes for each peak period.

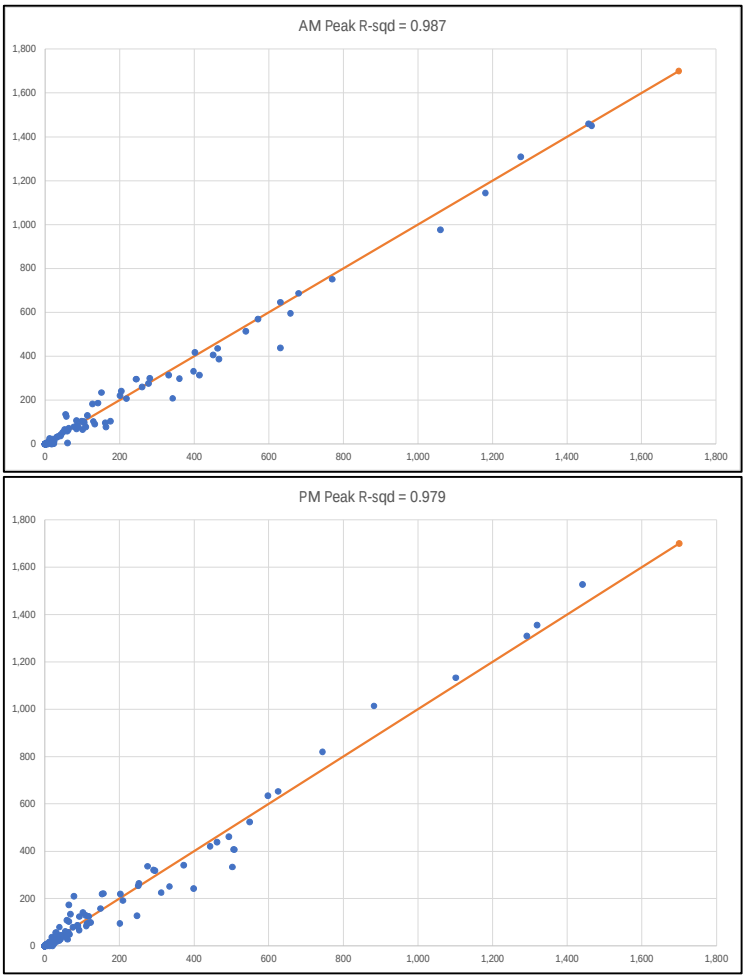


Figure 6 R-Squared Values for 2022 Base models

These graphs show that the models replicate the count data very well with the R-squared statistic well within the recommended limits.

2.6.2 Turn Volume Calibration

The tables below shows the GEH values for the turn volumes at the intersections for each peak hour.

				COUNT Data		Modelled Volumes			
				AM Peak	PM Peak	AM Peak		PM Peak	
Intersection	Approach	Description	Turn	Total	Total	Total	GEH	Total	GEH
1 Finucane / McDonald	South	McDonald	L	3	14	4	0.3	15	0.1
			T	34	25	35	0.1	21	0.6
			R	105	88	97	0.5	87	0.1
			U	0	0	0		0	
	East	Finucane	L	98	117	105	0.5	124	0.5
			T	1,276	1,101	1,309	0.7	1,123	0.5
			R	62	75	65	0.3	80	0.4
			U	0	0	0		0	
	North	McDonald	L	218	87	207	0.5	88	0.0
			T	32	32	31	0.1	31	0.1
			R	47	44	53	0.6	42	0.2
			U	0	0	0		0	
	West	Finucane	L	31	63	32	0.1	56	0.6
			T	1,181	1,319	1,144	0.8	1,358	0.7
			R	9	13	11	0.5	14	0.2
			U	2	0	0	1.4	0	
2 Finucane / Dawson	South		L	0	0	0		0	
			T	0	0	0		0	
			R	0	0	0		0	
			U	0	0	0		0	
	East	Finucane	L	0	0	0		0	
			T	1,458	1,292	1,459	0.0	1,313	0.4
			R	84	110	107	1.7	129	1.2
			U	0	0	0		0	
	North	Dawson	L	89	42	80	0.7	37	0.6
			T	0	0	0		0	
			R	12	12	25	2.2	17	1.0
			U	0	0	0		0	
	West	Finucane	L	16	21	0	4.0	0	4.6
			T	1,466	1,441	1,451	0.3	1,538	1.8
			R	0	0	0		0	
			U	0	0	0		0	
3 Finucane / Delancey	South	Delancey	L	538	506	514	0.8	441	2.1
			T	175	123	104	4.2	105	1.2
			R	24	33	11	2.1	19	1.9
			U	0	0	0		0	
	East	Finucane	L	20	25	23	0.5	0	4.9
			T	770	744	751	0.5	778	0.9
			R	113	66	130	1.1	56	0.9
			U	19	42	0	4.4	28	1.7
	North	Delancey	L	129	113	103	1.7	81	2.3
			T	133	149	91	2.8	162	0.7
			R	260	157	260	0.0	223	3.4
			U	0	1	0		0	1.0
	West	Finucane	L	204	202	241	1.8	214	0.6
			T	1,060	882	976	1.9	1,008	2.9
			R	281	372	300	0.8	336	1.4
			U	0	0	0		0	
4 Finucane / Wellington	South	Wellington	L	163	153	78	5.5	190	2.0
			T	342	399	208	5.7	230	6.7
			R	83	93	77	0.5	127	2.3
			U	3	1	0	1.7	0	1.0
	East	Finucane	L	52	111	66	1.3	87	1.7
			T	658	625	596	1.7	654	0.8
			R	201	250	221	1.0	252	0.1
			U	6	13	0	2.4	0	3.6
	North	Wellington	L	245	209	296	2.2	192	0.8
			T	451	334	405	1.6	248	3.6
			R	127	92	182	3.1	71	1.6
			U	7	6	0	2.6	0	2.4
	West	Finucane	L	85	102	84	0.0	138	2.3
			T	680	598	687	0.2	624	0.7
			R	331	275	314	0.7	348	2.9
			U	60	55	5	6.8	19	4.2

				COUNT Data		Modelled Volumes			
				AM Peak	PM Peak	AM Peak		PM Peak	
Intersection	Approach	Description	Turn	Total	Total	Total	GEH	Total	GEH
5 Wellington / Russell	South	Wellington	L	244	252	296	2.2	297	1.9
			T	414	443	314	3.7	395	1.7
			R	77	55	79	0.1	60	0.5
			U	1	1	0	1.0	0	1.0
	East	Russell	L	42	43	44	0.2	46	0.3
			T	360	247	297	2.4	137	5.6
			R	104	78	103	0.1	205	7.5
			U	0	0	0		0	
	North	Wellington	L	55	64	135	5.8	182	7.5
			T	571	493	569	0.0	466	0.9
			R	23	19	2	4.3	39	2.7
			U	0	2	0		0	1.4
	West	Russell	L	19	31	1	3.9	51	2.2
			T	161	201	97	4.0	86	6.8
			R	277	291	276	0.0	314	0.9
			U	0	0	0		0	
6 Wellington / Freeth	South	Wellington	L	109	115	78	2.3	77	2.7
			T	402	549	418	0.6	526	0.7
			R	15	18	15	0.0	16	0.4
			U					0	
	East	Freeth	L	2	23	3	0.6	24	0.2
			T	1	2	0	0.7	2	0.2
			R	1	7	0	1.0	6	0.3
			U					0	
	North	Wellington	L	1	3	1	0.3	4	0.4
			T	631	461	646	0.4	441	0.7
			R	59	39	58	0.1	77	3.5
			U					0	
	West	Freeth	L	63	59	72	0.8	105	3.6
			T	3	2	2	0.4	4	0.7
			R	151	63	235	4.3	45	1.8
			U					0	
7 Delancey / Freeth	South	Delancey	L	0	0	0		0	
			T	398	312	331	2.5	231	3.5
			R	57	69	126	5.1	135	4.6
			U	0	1	0		0	1.0
	East	Freeth	L	100	64	66	2.6	89	2.0
			T	0	0	0		0	
			R	84	89	69	1.2	69	1.6
			U	1	0	0	1.0	0	
	North	Delancey	L	142	61	186	2.5	20	4.5
			T	466	295	387	2.7	326	1.2
			R	0	0	0		0	
			U	0	0	0		0	
8 Delancey / Arthur	South	Delancey	L	41	27	37	0.5	29	0.2
			T	463	503	436	0.9	337	5.7
			R	5	5	3	0.8	9	1.0
			U	1	1	0	1.0	0	1.0
	East	Arthur	L	7	8	5	0.6	7	0.3
			T	0	0	0		0	
			R	3	1	5	0.8	2	0.5
			U	0	0	0		0	
	North	Delancey	L	1	7	3	1.0	2	1.6
			T	631	508	438	5.9	404	3.4
			R	12	15	14	0.3	11	0.8
			U	1	1	0	1.0	0	1.0
	West	Site Access	L	14	39	16	0.4	26	1.6
			T	0	0	0		0	
			R	13	29	9	0.8	52	2.6
			U	0	0	0		0	

Table 6 2022 Base model GEH Values for all turn movements

The focus of the calibration exercise was to replicate the turn volumes at the Finucane Road / Delancey Street intersection as this is the intersection likely to be the most affected by the

development traffic. GEH values of less than 5 (green cells) have been achieved for 93% and 94% of all turn movements in the AM and PM peak periods respectively. All the turn movements at the Finucane Road / Delancey Street intersection have GEH values of 5 or less. This is well within the recommended guidelines for calibration. More detailed calibration data including light and heavy vehicles volumes is included in Annexure B.

The 2022 Base models are therefore considered to be fit for purpose to be used to evaluate the impact of the proposed new access to the development on Finucane Road.

3 MODELLING RESULTS

3.1 Performance Criteria

The modelling evaluates the operation of the network and intersections during the weekday AM and PM peak periods. The count data indicates that the peak hours at the Finucane / Delancey intersection are as follows:

- AM Peak: 7:45am to 8:45am
- PM Peak: 4:00pm to 5:00 pm

These peak hours were therefore adopted for the models. The models were all run for 2 hours, one hour prior to the peak hour (warm-up period), and one hour representing the peak hour. Demands from zones on Finucane Road (east and west), McDonald Road, Russel Street and Wellington Street were profiled so that the releases into the network match the count data profiles.

All models were run with five seed values (RTA specified: 28, 560, 2859, 7771, 86524) and the reported results are the average for the five seeds.

The performance of the intersections is based on the modelled delays for all turn movements. The approach and intersection delays are a weighted average of the individual turn delays. The LOS criteria for signalized intersections, roundabouts and sign-controlled intersections are as per the following table (same criteria as used by SIDRA):

SIDRA LOS Criteria	Signal	Sign controlled	Roundabout
A	10	10	10
B	20	15	20
C	35	25	35
D	55	35	50
E	80	50	70
F	>80	>50	>70

Table 7 Level of Service Criteria (seconds)

3.2 Modelled Scenarios

To quantify the impact of the development traffic and the proposed upgrades to mitigate the impacts, the following scenarios were modelled:

Scenario	Network	Demands	Signals
1	Base (existing)	Background traffic	Existing
2	Base + development access	Background + development	Existing
3	Base + development access + Upgrade 1	Background + development	Revised for Upgrade 1
4	Base + development access + Upgrade 2	Background + development	Revised for Upgrade 2

Table 8 Modelled Scenarios

3.2.1 Scenario 1 – Existing Situation

These models represent the current operating conditions and serve as a base line or reference against which the other models are compared. As mentioned previously, the Base models used the signal phase times (as provided) and operate under actuated control. With these assumptions and signal control, a suitable calibration was achieved.

The Base model network in the vicinity of the development site is shown in the figure below.

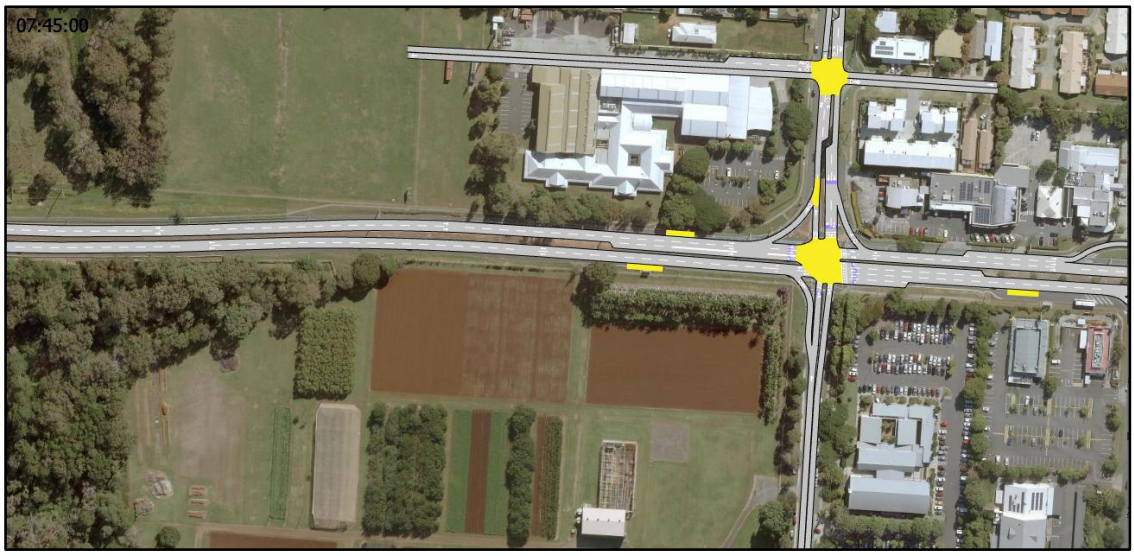


Figure 7 Base Model Network

The most important intersection in the network is the Finucane Road / Delancey Street intersection and this intersection effectively controls the operation of the traffic through the

simulation network in the vicinity of the development. The signal phase sequence used in the Base models (as per the data provided) is as follows:

Figure 8 Finucane/Delancey Intersection - Base Model Signal Phase Sequence

The signal data provided and used in the models is contained in Annexure E.

3.2.2 Scenario 2 – Existing Network with Development Traffic

This scenario comprises the inclusion of the development traffic and the new access on Finucane Road to the development. No other changes are made to the road network or the signal operation at the Finucane Road / Delancey Street intersection. The purpose of this scenario is to illustrate the impact the development traffic would have on the road network without any upgrades.

The development access on Finucane Road has a separate right-turn into the development (signalised and only triggered on demand) and two exiting lanes from the development site, also only triggered on demand.

Figure 9 Base Network with Development Accesses

The layout of the Finucane Road access intersection is shown below.

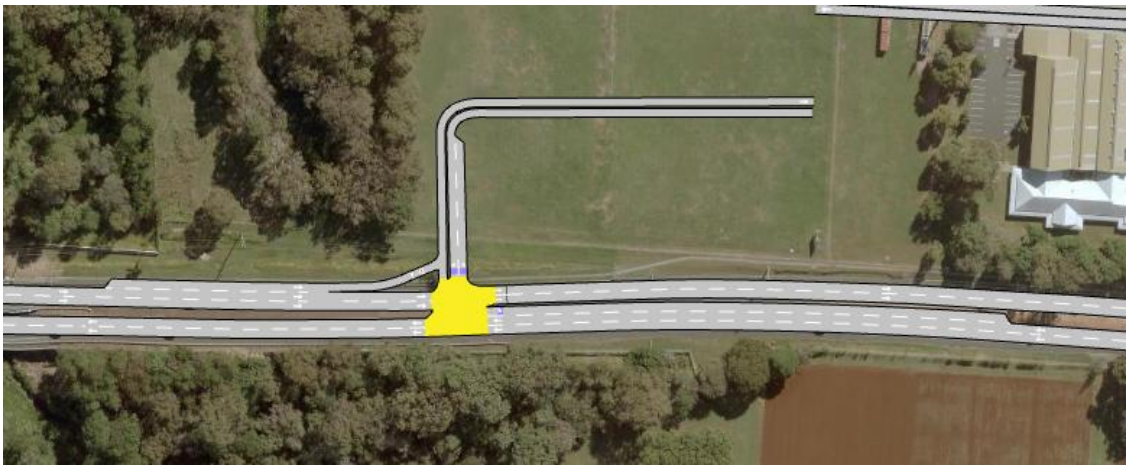


Figure 10 Access to Development site from Finucane Road

The signal phasing at this intersection is designed to minimise delays to the through traffic. The proposed signal phasing at the intersection is as follows:

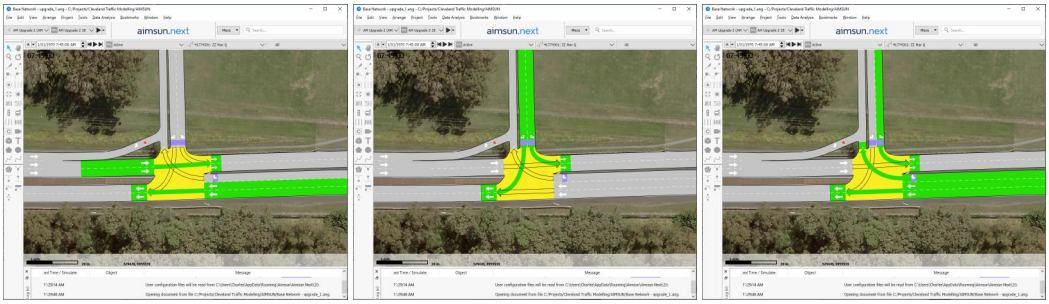


Figure 11 Signal Phasing – Finucane Road Development Access

3.2.3 Scenario 3 – Upgrade 1

The simulation models showed that some delays can occur on the NB approach to the Finucane Road / Delancey Street intersection. Northbound through vehicles on Delancey Street can queue at the stop line of the intersection with queues extending south on Delancey Street to beyond the start of the left-turn slip-lane from Delancey Street to Finucane Road. When this happens, the vehicles turning left cannot get into the left-turn lane and are delayed. To reduce the delays for these vehicles, a potential upgrade would be to extend the left-turn slip-lane so that left-turning vehicles have the ability to get into the left-turn lane without being delayed behind the stopped through traffic. This is shown in the figure below.

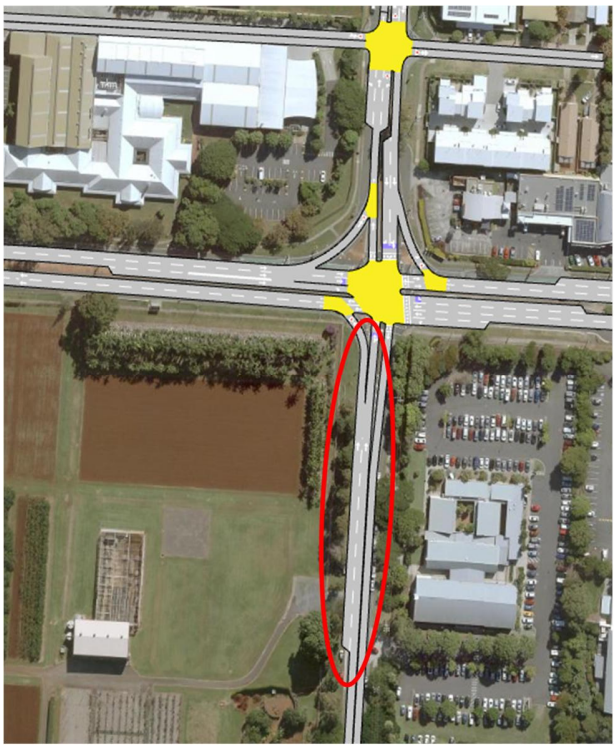


Figure 12 Upgrade Option 1 – Lengthened left-turn slip lane from Delancey Street to Finucane Road

In addition to these changes, the lane arrangement on the Delancey Street north approach was also altered by changing the lane configuration from a right-turn lane and a through lane to a right-turn lane and a shared through/right-turn lane.

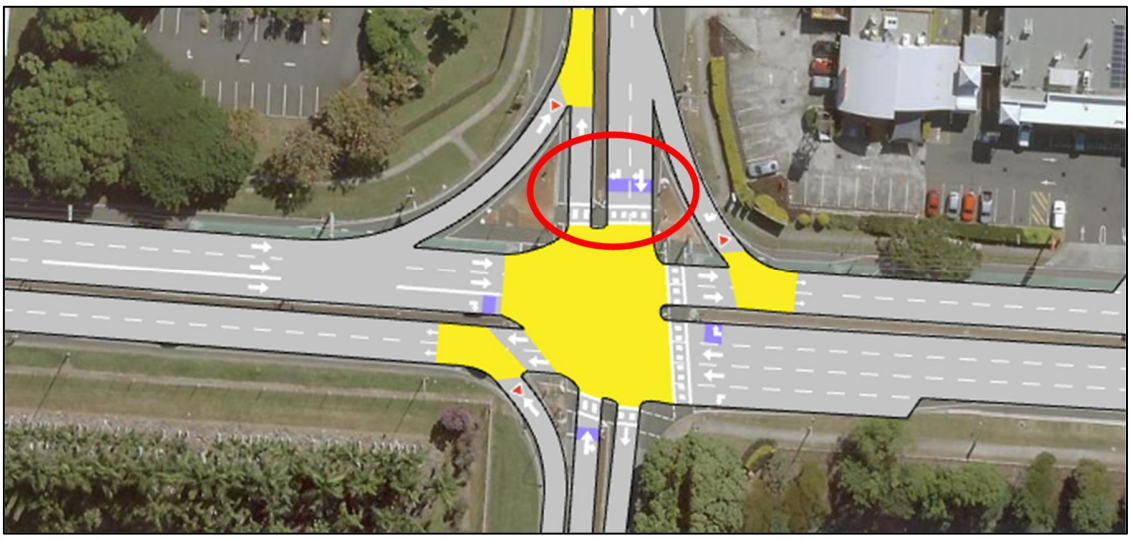


Figure 13 Finucane Road / Delancey Street - Lane arrangement

As the Finucane Road access intersection is relatively close to the Finucane Road / Delancey Street intersection (approximately 330m), the signals have been co-ordinated to encourage progression and to minimise delays. As a result, the signal phasing at the Finucane Road / Delancey Street intersection is no longer isolated but runs actuated and is co-ordinated with the signal at the development site access. The cycle times used are 160 seconds in the AM peak and 130 seconds in the PM peak (as these are the cycle times that are specified in the signal data received).

With this arrangement, it was found that some benefits could be achieved by some changes to the signal phasing at the Finucane Road / Delancey Street intersection by introducing a right-turn phase from Finucane Road EB to Delancey Street SB (last phase in the sequence below). (Note that this additional phase is already in the options for the signal currently in use however the data provided appears to indicate that this signal phase was not triggered).

Figure 14 Finucane/Delancey Intersection – Upgrade 1 Signal Phasing with Development

3.2.4 Scenario 4 – Upgrade 2

In this scenario a further upgrade to the Finucane Road / Delancey Street intersection is proposed comprising the addition of a second right-turn lane from Finucane Road EB to Delancey Street SB. This will require some widening of Delancey Street south of the intersection to accommodate the dual right-turn lanes. This “Upgrade 2” option is shown in the figure below.

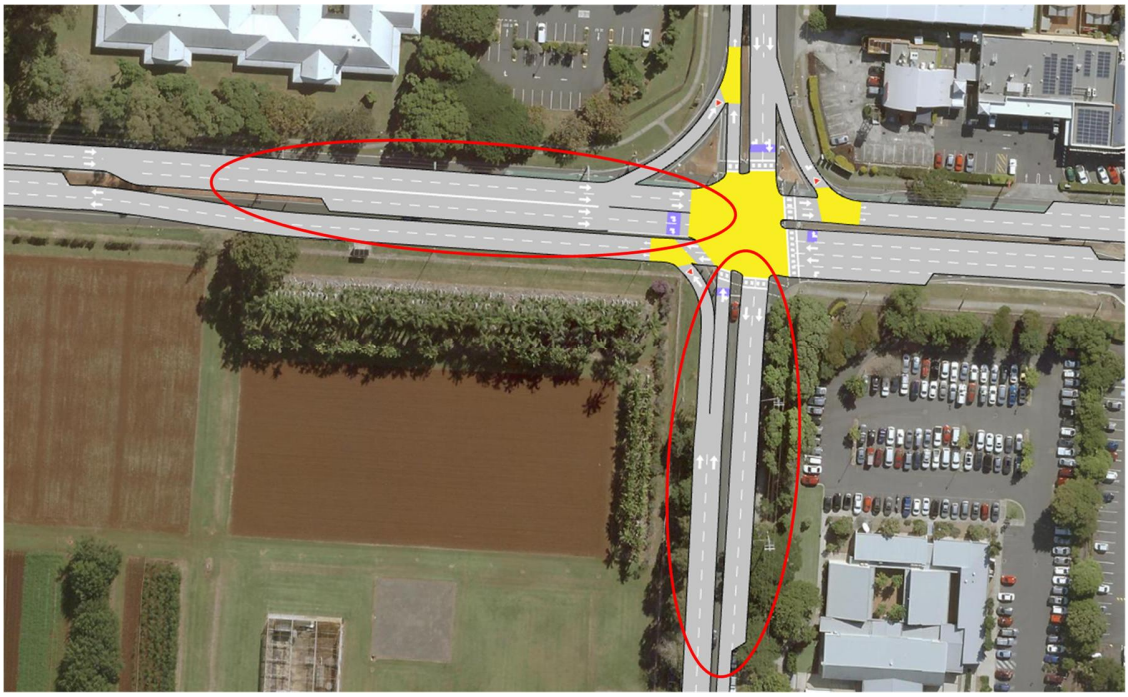


Figure 15 Upgrade Option 2 – Dual right-turn lane Finucane Road to Delancey Street

With this option the previous signal phases are not appropriate because the opposing right-turns (4th phase - EB to SB and WB to NB) cannot occur in the same phase. The signal phase sequence proposed for this option is as follows:

Figure 16 Finucane/Delancey Intersection – Upgrade 2 Signal Phasing with Development and dual right-turn lanes

The additional capacity provided by the second right-turn lane from Finucane Road means that more green time can be allocated to the east-west through movements as well as to the traffic on the Delancey Street north and south approaches to the intersection. This also encourages traffic to use Delancey Street to Wellington Street rather than proceeding east on Finucane Road to Wellington Street via the Wellington Street / Finucane Road roundabout which is the most congested during peak periods.

3.2.5 Scenario 5 – Upgrade 3

This scenario is similar to Scenario 4 but with a relatively minor change to the lane arrangement on Finucane Road east approach to the intersection. In this option the left-turn movement is combined with the through movement in the kerbside lane with a through lane and a right-turn lane.

This "Upgrade 3" option is shown in the figure below.

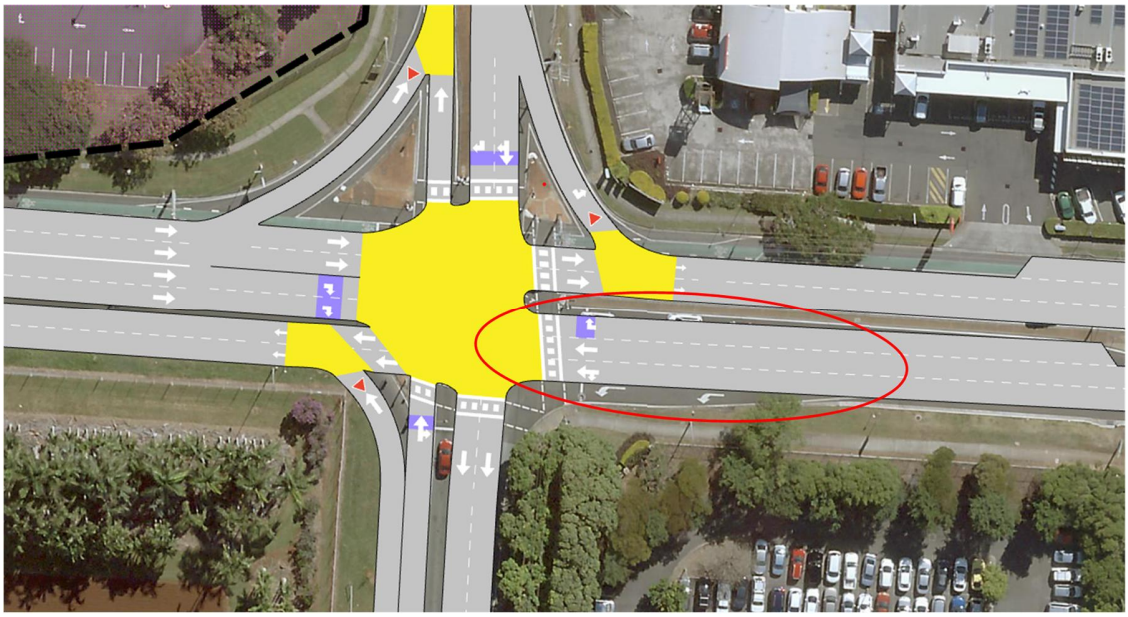


Figure 17 Upgrade Option 3 – Dual right-turn lane Finucane Road to Delancey Street

Changing this east approach may help facilitate providing the dual right-turn lanes on the west approach while minimising the construction impacts.

3.3 Intersection Performance

The performance of the network is based on the modelled delays at all the intersections in the network. From the model outputs the intersection level of service (LOS) can then be determined for each turn movement, each approach and each intersection. A summary of the intersection performance results using delay as the performance metric to determine the LOS is shown in the table below.

Intersection LOS	AM					PM				
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Intersection	Base Network	Base + development	Base with development + Upgrade 1	Base with development + Upgrade 2	Base with development + Upgrade 2	Base Network	Base + development	Base with development + Upgrade 1	Base with development + Upgrade 2	Base with development + Upgrade 2
1 Finucane / McDonald	C	C	D	C	C	C	C	C	C	C
2 Finucane / Dawson	A	A	A	A	A	A	A	A	A	A
3 Finucane / Delancey	E	E	E	D	D	E	E	D	C	C
4 Finucane / Wellington	C	D	C	C	C	B	C	C	C	C
5 Wellington / Russell	E	E	F	E	E	D	D	E	D	D
6 Wellington / Freeth	A	A	A	A	A	A	A	A	A	A
7 Delancey / Freeth	E	F	F	C	C	A	A	A	A	A
8 Delancey / Arthur	D	B	B	A	A	E	A	A	A	A
9 Finucane / Site Access		B	B	B	C		C	B	B	B

Table 9 Intersection Performance – Level of Service

The associated average vehicle delays for the LOS metrics are presented in the following table.

Intersection delays	AM					PM				
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Intersection	Base Network	Base + development	Base with development + Upgrade 1	Base with development + Upgrade 2	Base with development + Upgrade 3	Base Network	Base + development	Base with development + Upgrade 1	Base with development + Upgrade 2	Base with development + Upgrade 2
1 Finucane / McDonald	32.8	34.6	35.5	34.2	33.7	31.8	30.7	30.9	30.6	31.0
2 Finucane / Dawson	3.5	3.6	3.1	3.1	3.2	3.8	4.0	3.2	3.3	3.4
3 Finucane / Delancey	60.2	76.1	58.0	48.6	49.5	61.9	68.3	35.7	32.0	33.4
4 Finucane / Wellington	23.4	38.0	29.1	31.9	24.7	17.7	26.4	24.4	21.2	20.6
5 Wellington / Russell	60.0	75.2	80.3	77.7	77.6	45.6	50.0	54.4	50.6	50.2
6 Wellington / Freeth	4.8	7.3	3.9	3.3	3.0	3.3	2.9	3.9	2.8	3.0
7 Delancey / Freeth	49.3	74.5	56.8	22.4	23.0	8.5	7.5	6.9	3.7	2.2
8 Delancey / Arthur	33.8	13.9	12.9	7.3	7.6	44.3	6.5	8.5	5.9	4.2
9 Finucane / Site Access		16.3	11.4	13.1	22.1		24.7	13.5	13.1	16.8

Table 10 Intersection Performance – Delay (seconds / vehicle)

These results indicate that with the identified intersection upgrades similar intersection performance and delays to the original background vehicles can be achieved even with the development traffic added to the overall traffic demands.

(While no upgrades at the Wellington Road / Russell Street intersection were tested, the model suggest that some relatively minor upgrades to this intersection could result in further network performance benefits).

Annexure C contains more detailed results showing the intersection performance metrics for each scenario.

3.4 Network Performance

An overall performance measure for the network can be defined as the sum of all the delays at all the intersections. This is simply the sum of each turn movement multiplied by the associated delay for that turn movement for all intersections in the network. This calculation produces a number that is indicative of the total delay for all intersections in the network.

As before, the Base network can be used as a point of reference to determine the impact the development will have on delays. TMR require mitigation measures to be implemented so that the vehicles in the original Base network, or original background traffic, is not adversely affected by the new development traffic and the associated increases in delays that these vehicles will cause.

To do this comparison, the base case for the background traffic is determined. This is the reference “delay number”.

The background traffic turn volumes through all the intersections are multiplied by the "new" delays for each turn movement with the development traffic. Note that because some upgrades or changes to the network have been proposed, the routes taken by the original background traffic may have changed from their original routing to take advantage of the upgrades and improvements. For example, background traffic previously travelling from Finucane Road west to Wellington Street south may have travelled via Finucane Road through Finucane Road / Wellington Street roundabout. With the intersection upgrades at Delancey Street, some of these vehicles may choose to turn right into Delancey Street as this route option may be quicker.

With the simulation models this calculation is easily done by defining different vehicle types for the background traffic and the development traffic. The development traffic vehicles are then simply multiplied by the associated turn delays at all intersection to produce the new "delay number" for the upgraded network.

The table below presents the results of these calculations.

Background Traffic (Sum of turn volume x delay)	Total Delays (sec)		
	AM	PM	Both peaks
Network Scenario	Total	Total	All traffic
Scenario 1: Base existing network	629062	532573	1161636
Scenario 2: Base existing network with development	805784	618853	1424637
Scenario 3: Development + Upgrade 1 (lengthen slip-lane)	691710	474789	1166498
Scenario 4: Development + Upgrade 2 (slip lane + dual rights)	615284	433747	1049031
Scenario 5: Development + Upgrade 3 (slip lane + dual rights + re-alignment)	615128	433418	1048546

Table 11 Background Traffic Total Delay (sum of vehs x delay)

These results show that with the development traffic, there could be some additional delays to the background traffic, particularly during the AM peak. With Upgrade 1 the delays are mitigated to some extent with the overall delay for both peaks somewhat less than the delays in the original Base network. However, the delays during the AM peak still exceed the AM peak delays in the Base network.

With Upgrade 2 the total delays to the background vehicles in both peaks are reduced when compared with the delays in the Base network. The percentage increase or decrease in delays is shown in the following table.

Background traffic % Increase in delay vs Base	AM	PM	Both peaks
Network Scenario	Total	Total	All traffic
Scenario 2: Base existing network with development	28.1%	16.2%	22.6%
Scenario 3: Development + Upgrade 1 (lengthen slip-lane)	10.0%	-10.9%	0.4%
Scenario 4: Development + Upgrade 2 (slip lane + dual rights)	-2.2%	-18.6%	-9.7%
Scenario 5: Development + Upgrade 3 (slip lane + dual rights + re-alignment)	-2.2%	-18.6%	-9.7%

Table 12 Percentage increase in delays to Background Traffic vs Existing Base Network

4 CONCLUSIONS

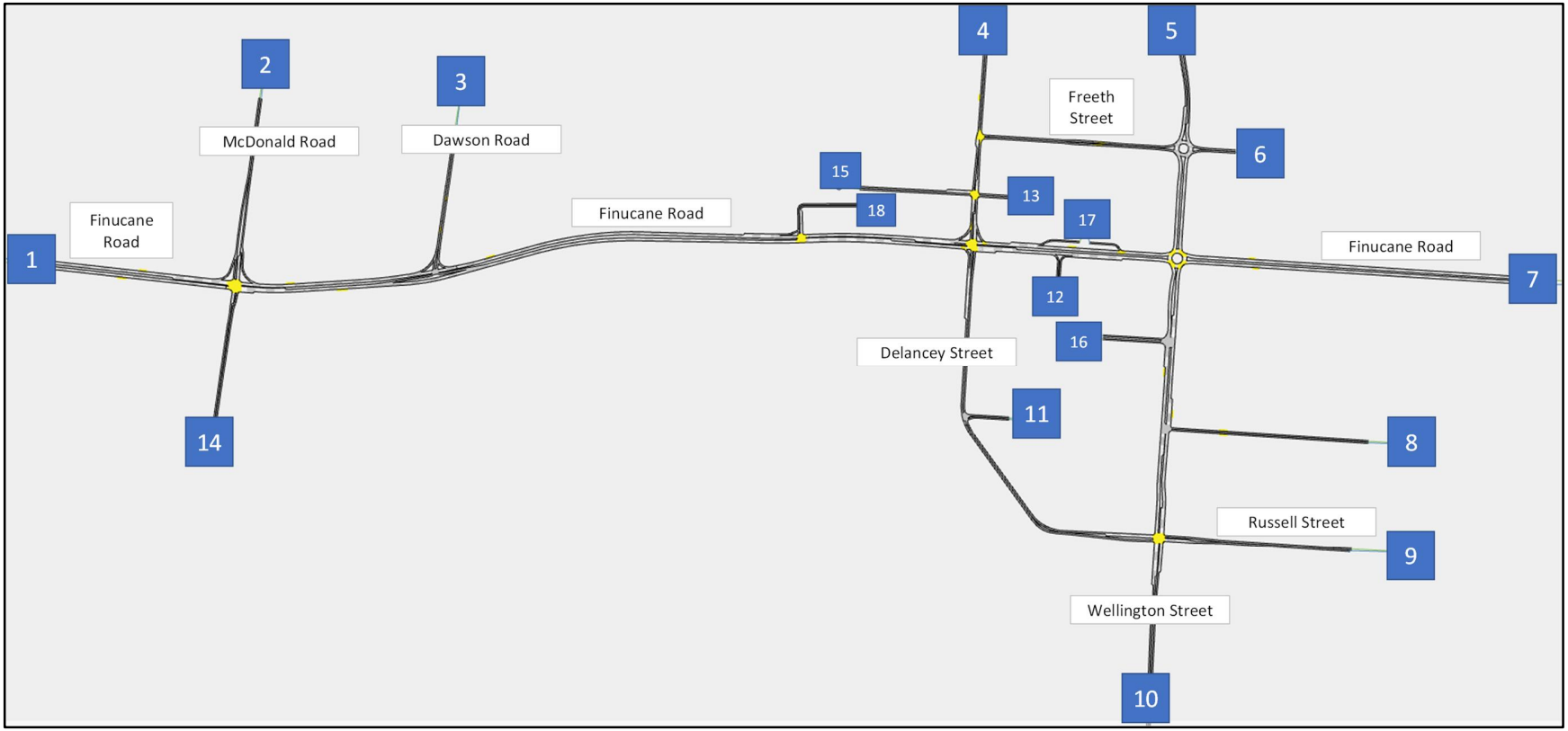
Based on the results of the simulation models, it is concluded that:

- The current network functions relatively well but some intersections, namely the Finucane Road / Delancey Street and the Wellington Road / Russell Street intersections, can be prone to congestion during peak periods.
- The development traffic will impact the performance of the network with the greatest impact likely to occur at the Finucane Road / Delancey Street intersection.
- With the development traffic added to the existing background traffic, delays can be expected to increase. However, these delays can largely be mitigated through some targeted network upgrades in conjunction with traffic signal operation changes.
- The current signal phasing will need to change so that the signals at the access to the development and the signals at the Finucane Road / Delancey Street intersection are vehicle actuated and coordinated with a common cycle time.
- The proposed upgrades are expected to encourage the use of the Delancey Steet connection between Finucane Road and Wellington Road. As a result, this is likely to impact the operation of the Wellington Road / Russell Street intersection which may require further localised upgrades to improve the operation at this location. (No evaluation of any upgrades at this intersection were investigated in this analysis)
- Upgrades 2 and 3 are expected to provide the best result in terms of reduced delays to the existing background traffic in both peak periods due to the significant increased capacity at the Finucane Road / Delancey Street intersection.
- There is little difference between Upgrades 2 and 3 (Scenarios 4 and 5) as the left-turn demand from Finucane Road WB to Delancey Street SB is very low and can easily be combined with the WB through traffic without a significant impact on the intersection performance.

ANNEXURE A – 2022 DEMAND MATRICES (WEEKDAY AM AND PM PEAKS)

This Annexure shows the original trip generation to and from the development site and the change in the assumptions regarding the use of the accesses.

Simulation Model Zones



Simulation Model Background Traffic Demands – 2022 AM Peak

AM Light	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
1	0	30	0	90	138	6	495	0	58	318	0	0	1	9	13	0	0	**1158**
2	47	0	0	20	0	0	110	0	13	71	0	0	0	30	0	0	0	**291**
3	25	0	0	0	0	0	38	0	4	24	0	0	0	3	0	0	0	**94**
4	239	0	0	0	0	0	0	0	42	229	50	0	1	0	9	0	0	**570**
5	164	0	0	0	0	3	247	70	29	159	0	0	0	0	0	0	0	**672**
6	1	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	**4**
7	369	29	44	101	155	7	0	0	65	0	0	0	2	43	15	0	0	**830**
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
9	206	16	25	56	86	0	0	0	0	40	0	0	1	24	8	0	0	**462**
10	250	19	30	68	105	5	80	0	75	0	0	0	1	29	10	0	0	**672**
11	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	**50**
12	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**40**
13	2	0	0	1	0	0	4	0	0	2	0	0	0	0	0	0	0	**9**
14	3	33	0	10	0	0	53	0	6	34	0	0	0	0	0	0	0	**139**
15	7	0	0	2	0	0	10	0	1	6	0	0	0	0	0	0	0	**26**
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total	**1353**	**127**	**99**	**398**	**484**	**21**	**1039**	**70**	**293**	**884**	**50**	**0**	**6**	**138**	**55**	**0**	**0**	**5017**

AM Heavy	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
1	0	1	0	6	4	0	19	0	3	19	0	0	0	2	0	0	0	**54**
2	1	0	0	0	0	0	1	0	0	1	0	0	0	2	0	0	0	**5**
3	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	**3**
4	5	0	0	0	0	0	0	0	1	6	0	0	0	0	0	0	0	**12**
5	3	0	0	0	0	0	4	0	1	4	0	0	0	0	0	0	0	**12**
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7	11	1	2	4	3	0	0	0	2	0	0	0	0	1	0	0	0	**24**
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
9	2	0	0	1	1	0	3	0	0	2	0	0	0	0	0	0	0	**9**
10	10	1	2	3	3	0	0	0	2	0	0	0	0	1	0	0	0	**22**
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
14	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	**3**
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total	**34**	**3**	**4**	**14**	**11**	**0**	**29**	**0**	**9**	**34**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**144**

Simulation Model Background Traffic Demands – 2022 PM Peak

PM Light	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
1	0	59	0	73	234	8	479	0	95	408	0	0	4	13	14	0	0	**1387**
2	44	0	0	6	0	0	40	0	8	34	0	0	0	32	0	0	0	**164**
3	16	0	0	0	0	0	17	0	3	14	0	0	0	2	0	0	0	**52**
4	118	0	0	0	0	0	0	0	24	104	100	0	1	0	4	0	0	**351**
5	162	0	0	0	0	3	167	0	33	142	0	0	0	0	0	0	0	**507**
6	9	0	0	0	7	0	9	0	0	8	0	0	0	0	0	0	0	**33**
7	411	41	68	65	208	7	0	0	84	0	0	0	4	63	12	0	0	**963**
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
9	101	10	17	16	51	0	105	0	0	41	0	0	1	15	3	0	0	**360**
10	238	24	39	38	120	4	0	0	55	0	0	70	2	36	7	100	0	**733**
11	0	0	0	100	0	0	0	0	0	0	0	30	0	0	0	0	0	**130**
12	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	**40**
13	3	0	0	0	0	0	3	0	1	2	0	0	0	0	0	0	0	**9**
14	12	25	0	6	0	0	41	0	8	35	0	0	0	0	0	0	0	**127**
15	20	0	0	3	0	0	21	0	4	18	0	0	0	0	0	0	0	**66**
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total	**1134**	**159**	**124**	**307**	**620**	**22**	**922**	**0**	**315**	**806**	**100**	**100**	**12**	**161**	**40**	**100**	**0**	**4922**

PM Heavy	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
1	0	4	0	0	1	0	6	0	0	6	0	0	0	0	0	0	0	**17**
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	**4**
5	3	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	**9**
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7	11	0	4	1	2	0	0	0	1	0	0	0	0	0	1	0	0	**20**
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
9	2	0	1	0	0	0	2	0	0	2	0	0	0	0	0	0	0	**7**
10	5	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**8**
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
14	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
15	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	**3**
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
17	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total	**26**	**4**	**7**	**1**	**4**	**0**	**12**	**0**	**1**	**14**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**70**

Simulation Model Traffic Demands – Development Traffic Only

Original AM Peak

eid	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Total
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	0	0	145	181
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	27	34
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	11	14
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	40	50
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	15	19
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	9	11
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	63	79
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	46	58
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	48	60
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	32	2	2	12	2	2	15	0	3	13	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	128	6	9	49	8	7	60	0	12	50	0	0	0	0	0	0	0	0	0
Total	160	8	11	61	10	9	75		15	63	0	0	0	0	0	0	0	0	918

Revised AM Peak

eid	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Total
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	181	181
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34	34
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	14
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0	0	0	50
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	0	0	0	19
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	11
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	63	79
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	46	58
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	48	60
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	61	10	9	15	0	0	0	0	0	0	0	0	0	0	0	95
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	160	8	11	0	0	0	60	0	15	63	0	0	0	0	0	0	0	0	317
Total	160	8	11	61	10	9	75	0	15	63	0	0	0	0	119	0	0	387	918

Original PM Peak

eid	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Total
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	0	0	134	167
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	9	11
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	5	6
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	29	36
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	10	13
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	7	9
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	53	66
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	30	37
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	43	54
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	37	2	4	14	3	3	16	0	5	15	0	0	0	0	0	0	0	0	79
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	149	10	14	55	11	13	64	0	22	61	0	0	0	0	0	0	0	0	320
Total	186	12	18	69	14	16	80		27	76	0	0	0	0	99	0	0	399	897

Revised PM Peak

eid	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Total
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	167	167
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	11
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36	0	0	0	36
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	13
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	9
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	53	66
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	30	37
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	43	54
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	69	14	16	16	0	0	0	0	0	0	0	0	0	0	0	115
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	186	12	18	0	0	0	64	0	27	76	0	0	0	0	0	0	0	0	383
Total	186	12	18	69	14	16	80	0	27	76	0	0	0	0	89	0	0	310	897

ANNEXURE B – INTERSECTION TURN VOLUME CALIBRATION

GEH Values – All intersections

				COUNT Data				Modelled Volumes					
				AM Peak	PM Peak			AM Peak				PM Peak	
Intersection	Approach	Description	Turn	Total	Light	Heavy	Total	Light	Heavy	Total	GEH	Total	GEH
1 Finucane / McDonald	South	McDonald	L	3	12	2	14	3	1	4	0.3	15	0.1
			T	34	25	0	25	35	0	35	0.1	21	0.6
			R	105	88	0	88	96	1	97	0.5	87	0.1
			U	0	0	0	0	0	0	0		0	
	East	Finucane	L	98	117	0	117	103	2	105	0.5	124	0.5
			T	1,276	1077	24	1,101	1275	34	1,309	0.7	1,123	0.5
			R	62	75	0	75	62	3	65	0.3	80	0.4
			U	0	0	0	0	0	0	0		0	
	North	McDonald	L	218	87	0	87	206	1	207	0.5	88	0.0
			T	32	32	0	32	29	3	31	0.1	31	0.1
			R	47	44	0	44	52	1	53	0.6	42	0.2
			U	0	0	0	0	0	0	0		0	
	West	Finucane	L	31	59	4	63	31	1	32	0.1	56	0.6
			T	1,181	1305	14	1,319	1097	47	1,144	0.8	1,358	0.7
			R	9	13	0	13	9	2	11	0.5	14	0.2
			U	2	0	0	0	0	0	0	1.4	0	
2 Finucane / Dawson	South		L	0	0	0	0	0	0	0		0	
			T	0	0	0	0	0	0	0		0	
			R	0	0	0	0	0	0	0		0	
			U	0	0	0	0	0	0	0		0	
	East	Finucane	L	0	0	0	0	0	0	0		0	
			T	1,458	1268	24	1,292	1421	38	1,459	0.0	1,313	0.4
			R	84	104	6	110	103	5	107	1.7	129	1.2
			U	0	0	0	0	0	0	0		0	
	North	Dawson	L	89	41	1	42	76	4	80	0.7	37	0.6
			T	0	0	0	0	0	0	0		0	
			R	12	12	0	12	24	1	25	2.2	17	1.0
			U	0	0	0	0	0	0	0		0	
	West	Finucane	L	16	21	0	21	0	0	0	4.0	0	4.6
			T	1,466	1429	12	1,441	1402	49	1,451	0.3	1,538	1.8
			R	0	0	0	0	0	0	0		0	
			U	0	0	0	0	0	0	0		0	
3 Finucane / Delancey	South	Delancey	L	538	496	10	506	514	0	514	0.8	441	2.1
			T	175	123	0	123	104	0	104	4.2	105	1.2
			R	24	33	0	33	11	0	11	2.1	19	1.9
			U	0	0	0	0	0	0	0		0	
	East	Finucane	L	20	24	1	25	23	0	23	0.5	0	4.9
			T	770	728	16	744	714	37	751	0.5	778	0.9
			R	113	65	1	66	126	4	130	1.1	56	0.9
			U	19	42	0	42	0	0	0	4.4	28	1.7
	North	Delancey	L	129	113	0	113	100	3	103	1.7	81	2.3
			T	133	149	0	149	91	0	91	2.8	162	0.7
			R	260	154	3	157	255	5	260	0.0	223	3.4
			U	0	1	0	1	0	0	0		0	1.0
	West	Finucane	L	204	200	2	202	230	12	241	1.8	214	0.6
			T	1,060	873	9	882	936	40	976	1.9	1,008	2.9
			R	281	370	2	372	300	0	300	0.8	336	1.4
			U	0	0	0	0	0	0	0		0	
4 Finucane / Wellington	South	Wellington	L	163	150	3	153	64	13	78	5.5	190	2.0
			T	342	393	6	399	201	7	208	5.7	230	6.7
			R	83	92	1	93	75	2	77	0.5	127	2.3
			U	3	1	0	1	0	0	0	1.7	0	1.0
	East	Finucane	L	52	107	4	111	64	2	66	1.3	87	1.7
			T	658	611	14	625	579	17	596	1.7	654	0.8
			R	201	248	2	250	216	4	221	1.0	252	0.1
			U	6	13	0	13	0	0	0	2.4	0	3.6
	North	Wellington	L	245	206	3	209	290	5	296	2.2	192	0.8
			T	451	327	7	334	395	11	405	1.6	248	3.6
			R	127	90	2	92	178	5	182	3.1	71	1.6
			U	7	6	0	6	0	0	0	2.6	0	2.4
	West	Finucane	L	85	102	0	102	81	4	84	0.0	138	2.3
			T	680	590	8	598	673	14	687	0.2	624	0.4
			R	331	272	3	275	288	26	314	0.7	348	2.9
			U	60	54	1	55	5	0	5	6.8	19	4.2
5 Wellington / Russell	South	Wellington	L	244	250	2	252	296	0	296	2.2	297	1.9
			T	414	436	7	443	292	22	314	3.7	395	1.7
			R	77	55	0	55	76	3	79	0.1	60	0.5
			U	1	1	0	1	0	0	0	1.0	0	1.0
	East	Russell	L	42	41	2	43	42	2	44	0.2	46	0.3
			T	360	242	5	247	297	0	297	2.4	137	5.6
			R	104	78	0	78	96	7	103	0.1	205	7.5
			U	0	0	0	0	0	0	0		0	
	North	Wellington	L	55	63	1	64	129	7	135	5.8	182	7.5
			T	571	482	11	493	538	31	569	0.0	466	0.9
			R	23	19	0	19	2	0	2	4.3	39	2.7
			U	0	2	0	2	0	0	0		0	1.4
	West	Russell	L	19	30	1	31	1	0	1	3.9	51	2.2
			T	161	200	1	201	97	0	97	4.0	86	6.8
			R	277	289	2	291	276	0	276	0.0	314	0.9
			U	0	0	0	0	0	0	0		0	
6 Wellington / Freeth	South	Wellington	L	109	114	1	115	75	3	78	2.3	77	2.7
			T	402	544	5	549	407	11	418	0.6	526	0.7
			R	15	18	0	18	15	0	15	0.0	16	0.4
			U									0	
	East	Freeth	L	2	23	0	23	3	0	3	0.6	24	0.2
			T	1	2	0	2	0	0	0	0.7	2	0.2
			R	1	7	0	7	0	0	0	1.0	6	0.3
			U									0	
	North	Wellington	L	1	3	0	3	1	0	1	0.3	4	0.4
			T	631	452	9	461	633	13	646	0.4	441	0.7
			R	59	39	0	39	58	0	58	0.1	77	3.5
			U									0	
	West	Freeth	L	63	59	0	59	69	2	72	0.8	105	3.6
			T	3	2	0	2	2	0	2	0.4	4	0.7
			R	151	61	2	63	228	7	235	4.3	45	1.8
			U									0	
7 Delancey / Freeth	South	Delancey	L	0	0	0	0	0	0	0		0	
			T	398	310	2	312	320	11	331	2.5	231	3.5
			R	57	68	1	69	122	4	126	5.1	135	4.6
			U	0	0	1	1	0	0	0		0	1.0
	East	Freeth	L	100	64	0	64	66	0	66	2.6	89	2.0
			T	0	0	0	0	0	0	0		0	
			R	84	89	0	89	66	3	69	1.2	69	1.6
			U	1	0	0	0	0	0	0	1.0	0	
	North	Delancey	L	142	60	1	61	181	6	186	2.5	20	4.5
			T	466	292	3	295	380	7	387	2.7	326	1.2
			R	0	0	0	0	0	0	0		0	
			U	0	0	0	0	0	0	0		0	
8 Delancey / Arthur	South	Delancey	L	41	26	1	27	37	0	37	0.5	29	0.2
			T	463	502	1	503	421	15	436	0.9	337	5.7
			R	5	5	0	5	3	0	3	0.8	9	1.0
			U	1	1	0	1	0	0	0	1.0	0	1.0
	East	Arthur	L	7	8	0	8	5	0	5	0.6	7	0.3
			T	0	0	0	0	0	0	0		0	
			R	3	1	0	1	5	0	5	0.8	2	0.5
			U	0	0	0	0	0	0	0		0	
	North	Delancey	L	1	7	0	7	3	0	3	1.0	2	1.6
			T	631	501	7	508	431	8	438	5.9	404	3.4
			R	12	14	1	15	14	0	14	0.3	11	0.8
			U	1	1	0	1	0	0	0	1.0	0	1.0
	West	Site Access	L	14	38	1	39	16	0	16	0.4	26	1.6
			T	0	0	0	0	0	0	0		0	
			R	13	28	1	29	9	0	9	0.8	52	2.6
			U	0	0	0	0	0	0	0		0	

ANNEXURE C – DETAILED INTERSECTION PERFORMANCE METRICS

The following tables contain the modelled turn volumes (background plus development traffic) and the associated delays for each turn movement. The approach and intersection delays are the weighted average of the respective turn delays.

SCENARIO 1: BACKGROUND TRAFFIC – NO DEVELOPMENT

			Modelled Volumes						Background Traffic - Without Development															
			AM Peak			PM Peak			AM Peak - Delays							PM Peak - Delays								
Intersection	Approach	Description	Turn	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Turn	LOS	Approach	LOS	Intersection	LOS	Light	Heavy	Turn	LOS	Approach	LOS	Intersection	LOS
1 Finucane / McDonald	South	McDonald	L	3	1	4	11	3	15	25.2	37.6	27.1	C	51.4	D	32.8	C	39.3	62.9	44.4	D	54.5	D	31.8	C
			T	35	0	35	21	0	21	54.4		54.4	D					61.4		61.4	E				
			R	96	1	97	87	0	87	51.2	67.6	51.3	D					54.6		54.6	D				
			U	0	0	0	0	0	0																
	East	Finucane	L	103	2	105	124	0	124	37.2	44.8	37.4	D	35.4	D			31.8		31.8	C	31.8	C		
			T	1275	34	1,309	1099	24	1,123	33.5	35.1	33.5	C					29.3	27.1	29.3	C				
			R	62	3	65	80	0	80	69.2	84.9	69.9	E					68.4		68.4	E				
			U	0	0	0	0	0	0																
	North	McDonald	L	206	1	207	88	0	88	10.1	35.7	10.2	B	22.5	C			12.7		12.7	B	31.0	C		
			T	29	3	31	31	0	31	55.6	59.6	55.9	E					52.8		52.8	D				
			R	52	1	53	42	0	42	50.4	52.5	50.5	D					52.9		52.9	D				
			U	0	0	0	0	0	0																
	West	Finucane	L	31	1	32	53	4	56	25.9	56.1	26.9	C	29.9	C			25.6	35.1	26.2	C	29.9	C		
			T	1097	47	1,144	1345	13	1,358	29.6	30.5	29.6	C					29.8	35.3	29.8	C				
			R	9	2	11	14	0	14	63.5	80.2	67.0	E					52.2		52.2	D				
			U	0	0	0	0	0	0																
2 Finucane / Dawson	South		L	0	0	0	0	0	0																
			T	0	0	0	0	0	0																
			R	0	0	0	0	0	0																
			U	0	0	0	0	0	0																
	East	Finucane	L	0	0	0	0	0	0					4.4	A	3.5	A					5.1	A	3.8	A
			T	1421	38	1,459	1289	24	1,313	2.9	5.2	2.9	A					2.9	5.0	2.9	A				
			R	103	5	107	121	8	129	24.2	19.1	23.9	C					27.0	33.4	27.4	D				
			U	0	0	0	0	0	0																
	North	Dawson	L	76	4	80	37	0	37	6.3	6.6	6.3	A	12.8	B			6.4		6.4	A	14.0	B		
			T	0	0	0	0	0	0																
			R	24	1	25	17	0	17	32.3	49.0	33.2	D					30.2		30.2	D				
			U	0	0	0	0	0	0																
	West	Finucane	L	0	0	0	0	0	0					2.0	A							2.1	A		
			T	1402	49	1,451	1525	13	1,538	1.9	2.9	2.0	A					2.1	3.1	2.1	A				
			R	0	0	0	0	0	0																
			U	0	0	0	0	0	0																
3 Finucane / Delancey	South	Delancey	L	514	0	514	441	0	441	32.3		32.3	C	47.7	D	60.2	E	33.5		33.5	C	50.1	D	61.9	E
			T	104	0	104	105	0	105	117.1		117.1	F					109.7		109.7	F				
			R	11	0	11	19	0	19	107.2		107.2	F					103.4		103.4	F				
			U	0	0	0	0	0	0																
	East	Finucane	L	23	0	23	0	0	0	37.5		37.5	D	47.3	D			65.3		65.3	E	45.4	D		
			T	714	37	751	751	27	778	40.8	46.1	41.1	D					41.7	43.0	41.7	D				
			R	126	4	130	55	1	56	84.6	92.5	84.9	F					80.8	98.0	81.2	F				
			U	0	0	0	28	0	28									77.0		77.0	E				
	North	Delancey	L	100	3	103	80	1	81	35.8	34.8	35.8	D	82.3	F			41.0	29.5	40.9	D	75.9	E		
			T	91	0	91	162	0	162	91.1		91.1	F					82.6		82.6	F				
			R	255	5	260	218	5	223	97.3	119.8	97.8	F					83.4	96.5	83.7	F				
			U	0	0	0	0	0	0																
	West	Finucane	L	230	12	241	214	0	214	51.2	68.3	52.0	D	66.5	E			50.6	89.6	50.7	D	71.0	E		
			T	936	40	976	996	12	1,008	57.2	57.5	57.2	E					62.2	71.9	62.3	E				
			R	300	0	300	336	0	336	108.3		108.3	F					110.2		110.2	F				
			U	0	0	0	0	0	0																
4 Finucane / Wellington	South	Wellington	L	64	13	78	181	9	190	23.0	17.8	22.2	C	20.2	C	23.4	C	12.7	15.6	12.9	B	14.3	B	17.7	B
			T	201	7	208	228	2	230	17.7	23.3	17.9	B					12.3	17.8	12.3	B				
			R	75	2	77	125	1	127	24.2	31.3	24.3	C					20.3	15.4	20.2	C				
			U	0	0	0	0	0	0																
	East	Finucane	L	64	2	66	86	1	87	13.3	15.9	13.4	B	22.8	C			10.7	5.9	10.6	B	14.2	B		
			T	579	17	596	636	18	654	20.7	21.0	20.7	C					13.8	17.0	13.9	B				
			R	216	4	221	248	3	252	31.2	39.0	31.4	C					16.3	19.5	16.3	B				
			U	0	0	0	0	0	0																
	North	Wellington	L	290	5	296	191	1	192	15.8	20.7	15.9	B	19.6	B			9.3	16.8	9.3	A	10.8	B		
			T	395	11	405	244	3	248	16.6	21.7	16.7	B					11.0	11.2	11.0	B				
			R	178	5	182	70	2	71	32.3	30.4	32.2	C					13.8	13.1	13.8	B				
			U	0	0	0	0	0	0																
	West	Finucane	L	81	4	84	137	1	138	21.5	32.4	21.9	C	27.9	C			23.4	18.8	23.4	C	25.7	C		
			T	673	14	687	619	5	624	26.5	32.0	26.6	C					24.8	23.9	24.8	C				
			R	288	26	314	341	7	348	32.7	33.2	32.7	C					28.8	34.0	28.9	C				
			U	5	0	5	19	0	19	9.9	46.9	11.4	B					12.0		12.0	B				
5 Wellington / Russell	South	Wellington	L	296	0	296	297	0	297	44.2		44.2	D	45.5	D	60.0	E	40.0		40.0	D	40.1	D	45.6	D
			T	292	22	314	387	8	395	39.1	43.3	39.4	D					36.9	42.5	37.0	D				
			R	76	3	79	60	0	60	74.5	68.1	74.3	E					60.5		60.5	E				
			U	0	0	0	0	0	0																
	East	Russell	L	42	2	44	43	3	46	101.0	156.4	103.5	F	106.8	F			59.1	63.1	59.3	E	59.1	E		
			T	297	0	297	137	0	137	103.4		103.4	F					57.9		57.9	E				
			R	96	7	103	201	4	205	118.4	115.0	118.2	F					59.6	73.6	59.9	E				
			U	0	0	0	0	0	0																
	North	Wellington	L	129	7	135	181	1	182	44.2	45.4	44.3	D	42.8	D			39.6	32.6	39.6	D	41.3	D		
			T	538	31	569	456	10	466	41.8	46.3	42.1	D					39.5	40.6	39.6	D				
			R	2	0	2	39	0	39	142.2		142.2	F					69.4		69.4	E				
			U	0	0	0	0	0	0																
	West	Russell	L	1	0	1	51	0	51	46.1		46.1	D	63.9	E			52.7		52.7	D	49.8	D		
			T	97	0	97	86	0	86	56.5		56.5	E					51.9		51.9	D				
			R	276	0	276	314	0	314	66.6		66.6	E					48.8		48.8	D				
			U	0	0	0	0	0	0																
6 Wellington / Freeth	South	Wellington	L	75	3	78	75	2	77	3.3	5.5	3.3	A	3.3	A	4.8	A	3.0	4.3	3.0	A	3.3	A	3.3	A
			T	407	11	418	522	4	526	3.2	5.7	3.3	A					3.3	5.5	3.4	A				
			R	15	0	15	16	0	16	3.2		3.2	A					3.2		3.2	A				
			U				0	0	0																
	East	Freeth	L	3	0	3	24	0	24	8.5		8.5	A	8.4	A			3.9		3.9	A	4.0	A		
			T	0	0	0	2	0	2	6.2		6.2	A					3.1		3.1	A				
			R	0	0	0	6	0	6									4.6		4.6	A				
			U				0	0	0																
	North	Wellington	L	1	0	1	4	0	4	2.1		2.1	A	5.2	A			1.9		1.9	A	2.3	A		
			T	633	13	646	435	6	441	5.2	5.8	5.2	A					2.4	2.6	2.4	A				
			R	58	0	58	76	1	77	4.9	4.4	4.9	A					2.0	2.2	2.0	A				
			U				0	0	0																
	West	Freeth	L	69	2	72	105	0	105	6.6	12.5	6.8	A	6.5	A			7.8		7.8	A	6.9	A		
			T	2	0	2	4	0	4	5.8		5.8	A					9.4		9.4	A				
			R	228	7	235	44	1	45	6.4	6.4	6.4	A					4.6	2.3	4.6	A				
			U				0	0	0																
7 Delancey / Freeth	South	Delancey	L	0	0	0	0	0	0					0.7	A	49.3	E					0.3	A	8.5	A
			T	320	11	331	231	0	231	0.3	0.5	0.3	A					0.1		0.1	A				
			R	122	4	126	135	0	135	1.9	0.5	1.8	A					0.4	0.9	0.4	A				
			U	0	0	0	0	0	0																
	East	Freeth	L	66	0	66	87	1	89	209.1	104.8	208.5	F	199.3	F			24.6	6.5	24.3	C	23.9	C		
			T	0	0	0	0	0	0																
			R	66	3	69	68	1	69	191.7	160.2	190.4	F					23.5	9.9	23.2	C				
			U	0	0	0	0	0	0																
	North	Delancey	L	181	6	186	20	0	20	46.9	76.6	47.8	E	52.6	F			5.5	1.0	5.4	A	10.1	B		
			T	380	7	387	323	3	326	55.1	49.1	55.0	F					10.5	5.9	10.4	B				
			R	0	0	0	0	0	0																
			U	0	0	0	0	0	0																
8 Delancey / Arthur	South	Delancey	L	37	0	37	27	1	29	1.7		1.7	A	0.4	A	33.8	D	1.5	3.2	1.6	A	0.6	A	44.3	E
			T	421	15	436	337	0	337	0.3	0.3	0.3	A					0.2	0.4	0.2	A				
			R	3	0	3	9	0	9	8.4		8.4	A					11.4		11.4	B				
			U	0	0	0	0	0	0																
	East	Arthur	L	5	0	5	7	0	7	179.8		179.8	F	141.4	F			190.1		190.1	F	191.2	F		
			T	0	0	0	0	0	0																
			R	5	0	5	2	0	2	106.0		106.0	F					195.6		195.6	F				
			U	0	0	0	0	0	0																
	North	Delancey	L	3	0	3	2	0	2	42.4		42.4	E	51.5	F			29.3		29.3	D	33.9	D		
			T	431	8	438	401	3	404	51.6	53.4	51.7	F					33.9	40.1	33.9	D				
			R	14	0	14	10	0	11	48.2		48.2	E					34.6	24.1	34.2	D				
			U	0	0	0	0	0	0																
	West	Site Access	L	16	0	16	26	0	26	258.8		258.8	F	298.6	F			343.7	743.9	346.8	F	291.9	F		
			T	0	0	0	0	0	0																
			R	9	0	9	43	3	52	367.7		367.7	F					262.2	298.4	264.0	F				
			U	0	0	0	0	0	0																

SCENARIO 2: BACKGROUND + DEVELOPMENT TRAFFIC – NO UPGRADES

				Modelled Volumes - Development						Level of Service with Development Traffic - No Upgrade													
				AM Peak			PM Peak			AM Peak - Delays								PM Peak - Delays							
Intersection	Approach	Description	Turn	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Turn	LOS	Approach	LOS	Intersection	LOS	Light	Heavy	Turn	LOS	Approach	LOS	Intersection	LOS
1 Finucane / McDonald	South	McDonald	L	3	2	5	13	2	14	18.7	31.2	23.5	C	28.7	C	34.6	C	20.8	63.6	26.2	C	29.5	C	30.7	C
			T	38	0	38	27	0	27	26.5	17.9	26.4	C					28.6	0.0	28.6	C				
			R	113	2	114	86	0	86	28.8	92.5	29.6	C					30.4	0.0	30.4	C				
			U	0	0	0	0	0	0									0.0	0.0						
	East	Finucane	L	86	2	88	116	0	116	22.4	43.7	22.9	C	40.5	D			19.3	0.0	19.3	B	32.3	C		
			T	1373	32	1405	1296	25	1321	39.9	44.8	40.0	D					30.9	33.7	31.0	C				
			R	69	1	70	90	0	90	72.9	82.7	72.9	E					69.1	0.0	69.1	E				
			U	0	0	0	0	0	0									0.0	0.0						
	North	McDonald	L	244	2	246	101	0	101	13.3	25.0	13.4	B	16.8	B			15.4	0.0	15.4	B	21.1	C		
			T	31	2	33	34	0	34	26.6	43.8	27.4	C					28.7	0.0	28.7	C				
			R	50	1	51	43	0	43	26.1	56.0	26.5	C					28.5	0.0	28.5	C				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Finucane	L	29	1	30	52	4	56	12.5	15.7	12.6	B	32.8	C			12.2	38.2	13.9	B	30.4	C		
			T	1282	46	1328	1514	13	1527	33.1	37.3	33.2	C					30.9	37.4	31.0	C				
			R	10	3	12	14	0	14	29.6	60.5	36.0	D					32.1	0.0	32.1	C				
			U	0	0	0	0	0	0									0.0	0.0						
2 Finucane / Dawson	East	Finucane	L	0	0	0	0	0	0					4.5	A	3.6	A	0.0	0.0			4.9	A	4.0	A
			T	1518	33	1551	1481	26	1507	2.7	5.0	2.7	A					2.2	4.0	2.3	A				
			R	106	3	109	147	9	156	29.6	32.2	29.6	D					29.5	37.9	30.0	D				
			U	0	0	0	0	0	0									0.0	0.0						
	North	Dawson	L	84	0	84	44	0	44	8.0	0.5	8.0	A	12.0	B			7.1	0.0	7.1	A	10.4	B		
			T	0	0	0	0	0	0									0.0	0.0						
			R	28	2	30	19	0	19	22.0	39.2	23.1	C					18.2	0.0	18.2	C				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Finucane	L	0	0	0	0	0	0					2.1	A			0.0	0.0			2.9	A		
			T	1636	49	1685	1706	13	1718	2.1	3.1	2.1	A					2.9	3.4	2.9	A				
			R	0	0	0	0	0	0									0.0	0.0						
			U	0	0	0	0	0	0									0.0	0.0						
3 Finucane / Delancey	South	Delancey	L	430	0	430	399	0	399	81.5		81.5	F	99.2	F	76.1	E	42.7	0.0	42.7	D	59.4	E	68.3	E
			T	96	0	96	94	0	94	178.6		178.6	F					125.7	0.0	125.7	F				
			R	11	0	11	27	0	27	102.0		102.0	F					73.2	0.0	73.2	C				
			U	0	0	0	0	0	0									0.0	0.0						
	East	Finucane	L	38	0	38	3	0	3	28.3		28.3	C	67.6	E			22.4	0.0	22.4	C	51.4	D		
			T	884	31	915	921	29	951	52.6	59.0	52.8	D					46.7	47.7	46.7	D				
			R	214	5	219	68	2	69	136.1	150.0	136.4	F					87.2	113.8	87.8	F				
			U	0	0	0	25	0	25									131.5	0.0	131.5	F				
	North	Delancey	L	96	4	99	66	1	67	19.6	15.7	19.4	B	49.1	D			14.5	43.6	15.0	B	36.9	D		
			T	67	0	67	154	0	154	55.9		55.9	E					40.1	0.0	40.1	D				
			R	228	3	232	196	4	201	58.8	127.0	59.8	F					40.8	84.2	41.8	D				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Finucane	L	280	10	290	225	0	225	59.2	60.3	59.3	E	81.1	F			34.1	106.0	34.3	C	89.2	F		
			T	1001	38	1039	1104	12	1116	64.9	73.1	65.2	E					82.4	85.6	82.4	F				
			R	332	0	332	374	0	374	150.0		150.0	F					142.5	0.0	142.5	F				
			U	0	0	0	0	0	0									0.0	0.0						
4 Finucane / Wellington	South	Wellington	L	206	10	216	306	9	316	33.8	43.1	34.2	C	29.8	C	38.0	D	21.2	29.1	21.4	C	19.7	B	26.4	C
			T	173	3	176	242	3	244	27.1	37.4	27.3	C					20.0	28.6	20.0	C				
			R	76	3	79	117	2	119	22.2	42.7	23.0	C					13.8	36.7	14.3	B				
			U	0	0	0	0	0	0									0.0	0.0						
	East	Finucane	L	75	2	77	72	0	72	74.9	59.7	74.6	F	65.8	E			8.9	5.5	8.9	A	23.4	C		
			T	629	16	645	684	18	702	59.5	49.4	59.3	E					22.4	26.0	22.4	C				
			R	198	3	201	271	4	275	82.7	129.5	83.3	F					29.5	47.6	29.7	C				
			U	0	0	0	0	0	0									0.0	0.0						
	North	Wellington	L	345	4	349	207	2	209	21.2	20.6	21.1	C	28.2	C			9.6	5.1	9.6	A	8.9	A		
			T	397	13	410	253	4	257	29.6	20.5	29.3	C					5.9	20.8	6.1	A				
			R	246	4	250	98	2	100	36.4	31.4	36.3	D					14.4	18.6	14.5	B				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Finucane	L	75	3	78	131	0	131	10.5	32.9	11.3	B	27.8	C			18.2	21.1	18.2	B	40.6	D		
			T	687	15	702	686	5	691	27.9	30.3	28.0	C					38.6	44.6	38.6	D				
			R	345	24	369	406	7	413	30.3	37.9	30.8	C					50.6	66.8	50.9	E				
			U	0	0	0	0	0	0									0.0	0.0						
5 Wellington / Russell	South	Wellington	L	233	0	233	264	0	264	48.4		48.4	D	44.3	D	75.2	E	49.8	0.0	49.8	D	44.8	D	50.0	D
			T	410	19	429	482	10	492	41.3	46.1	41.5	D					42.9	41.8	42.9	D				
			R	78	3	81	56	0	56	44.9	114.8	47.0	D					37.6	0.0	37.6	D				
			U	0	0	0	0	0	0									0.0	0.0						
	East	Russell	L	34	0	34	45	3	48	85.6		85.6	F	180.4	F			32.6	73.3	35.2	D	69.6	E		
			T	260	0	260	140	0	140	167.1		167.1	F					70.6	0.0	70.6	E				
			R	135	6	141	223	6	230	226.2	271.9	228.1	F					75.7	91.3	76.1	E				
			U	0	0	0	0	0	0									0.0	0.0						
	North	Wellington	L	115	5	120	175	0	176	45.1	52.4	45.4	D	51.5	D			45.0	45.7	45.0	D	45.9	D		
			T	600	33	633	528	11	539	47.5	50.3	47.7	D					43.6	56.4	43.9	D				
			R	28	0	28	40	0	40	163.2		163.2	F					77.8	0.0	77.8	E				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Russell	L	16	0	16	76	0	76	27.8		27.8	C	64.7	E			26.8	0.0	26.8	C	48.1	D		
			T	126	0	126	108	0	108	60.0		60.0	E					58.2	0.0	58.2	E				
			R	265	0	265	313	0	313	69.1		69.1	F					49.8	0.0	49.8	D				
			U	0	0	0	0	0	0									0.0	0.0						
6 Wellington / Freeth	South	Wellington	L	39	1	40	127	4	131	3.8	5.1	3.8	A	1.9	A	7.3	A	3.3	5.6	3.4	A	2.1	A	2.9	A
			T	392	8	400	504	3	507	1.6	5.8	1.7	A					1.7	5.3	1.7	A				
			R	13	0	13	16	0	16	1.5		1.5	A					1.7	0.0	1.7	A				
			U	0			0	0	0									0.0	0.0						
	East	Freeth	L	15	0	15	27	0	27	5.9		5.9	A	5.8	A			3.1	0.0	3.1	A	3.2	A		
			T	1	0	1	8	0	8	4.5		4.5	A					4.5	0.0	4.5	A				
			R	0	0	0	5	0	5									1.6	0.0	1.6	A				
			U	0			0	0	0									0.0	0.0						
	North	Wellington	L	3	0	3	3	0	3	2.4		2.4	A	10.7	B			1.3	0.0	1.3	A	2.7	A		
			T	648	11	659	443	5	448	10.7	10.2	10.6	B					2.7	4.5	2.7	A				
			R	45	0	45	72	1	74	11.3		11.3	B					2.6	5.1	2.7	A				
			U	0			0	0	0									0.0	0.0						
	West	Freeth	L	85	2	86	131	0	132	7.2	6.0	7.1	A	7.4	A			5.8	15.6	5.8	A	5.8	A		
			T	13	0	13	19	0	19	5.9		5.9	A					6.6	0.0	6.6	A				
			R	333	10	343	87	3	90	7.5	8.8	7.6	A					5.7	5.4	5.7	A				
			U	0			0	0	0									0.0	0.0						
7 Delancey / Freeth	South	Delancey	L	0	0	0	0	0	0					2.3	A	74.5	F	0.0	0.0			0.6	A	7.5	A
			T	414	12	425	277	0	277	1.3	0.6	1.3	A					0.5	0.0	0.5	A				
			R	212	3	215	229	4	233	4.3	3.8	4.3	A					0.7	1.8	0.7	A				
			U	0	0	0	0	0	0									0.0	0.0						
	East	Freeth	L	58	0	58	118	4	122	759.7		759.7	F	606.2	F			28.2	47.0	28.9	D	24.0	C		
			T	0	0	0	0	0	0									0.0	0.0						
			R	38	1	39	97	1	98	358.3	998.4	374.9	F					17.4	99.4	18.0	C				
			U	0	0	0	0	0	0									0.0	0.0						
	North	Delancey	L	228	9	236	16	0	16	38.4	98.3	40.6	E	66.5	F			4.0	0.0	4.0	A	7.3	A		
			T	400	7	407	368	3	371	81.8	63.7	81.5	F					7.4	8.5	7.4	A				
			R	0	0	0	0	0	0									0.0	0.0						
			U	0	0	0	0	0	0									0.0	0.0						
8 Delancey / Arthur	South	Delancey	L	90	0	90	49	1	51	2.3		2.3	A	0.7	A	13.9	B	2.0	3.6	2.1	A	0.4	A	6.5	A
			T	497	15	512	332	1	332	0.4	0.8	0.4	A					0.1	0.2	0.1	A				
			R	3	0	3	7	0	7	2.1		2.1	A					2.9	0.0	2.9	A				
			U	0	0	0	0	0	0									0.0	0.0						
	East	Arthur	L	5	0	5	8	0	8	27.6		27.6	D	19.9	C			12.0	0.0	12.0	B	11.8	B		
			T	0	0	0	0	0	0									0.0	0.0						
			R	3	0	3	0	0	0	7.1		7.1	A					3.5	0.0	3.5	A				
			U	0	0	0	0	0	0									0.0	0.0						
	North	Delancey	L	1	0	1	3	0	3	22.2		22.2	C	32.3	D			11.3	0.0	11.3	B	11.9	B		
			T	389	7	396	408	5	414	29.6	54.9	30.0	D					10.0	36.8	10.4	B				
			R	70	0	70	74	1	75	45.1		45.1	E					19.9	30.7	20.1	C				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Site Access	L	126	0	126	173	3	176	9.1		9.1	A	9.1	A			4.9	5.4	4.9	A	4.9	A		
			T	0	0	0	0	0	0									0.0	0.0						
			R	0	0	0	0	0	0									0.0	0.0						
			U	0	0	0	0	0	0									0.0	0.0						
9 Finucane / Development access	South		L	0	0	0	0	0	0									0.0	0.0						
	East	Finucane	T	1437	35	1471	1403	34	1437	5.1	13.4	5.3	A	8.0	A	16.3	B	6.6	13.8	6.8	A	11.2	B	24.7	C
			R	134	0	134	125	0	125	37.1		37.1	D					61.8	0.0	61.8	E				
			U	0	0	0	0	0	0									0.0	0.0						
	North	Development	L	132	0	132	164	0	164	24.6		24.6	C	29.3	C			27.6	0.0	27.6	C	27.2	C		
			T	0	0	0	0	0	0									0.0	0.0						
			R	186	0	186	220	0	220	32.7		32.7	C					26.9	0.0	26.9	C				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Finucane	L	229	0	229	187	0	187	10.5		10.5	B	21.4	C			20.8	0.0	20.8	C	36.3	D		
			T	1503	48	1551	1555	12	1567	22.1	53.3	23.1	C					37.7	92.5	38.1	D				
			R	0	0	0	0	0	0									0.0	0.0						
			U	0	0	0	0	0	0									0.0	0.0						

SCENARIO 3: BACKGROUND + DEVELOPMENT TRAFFIC – UPGRADE 1

			Modelled Volumes - with Development traffic						Level of Service with Development Traffic - Upgrade 1													
			AM Peak			PM Peak			AM Peak - Delays								PM Peak - Delays							
Intersection	Approach	Description	Turn	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Turn	LOS	Approach	LOS	Intersection	LOS	Light	Heavy	Turn	LOS	Approach	LOS	Intersection	LOS
1 Finucane / McDonald	South	McDonald	L	2	2	4	12	2	14	19.8	54.6	35.2	D	29.7	C	35.5	D	22.7	46.5	25.7	C			30.9	C
			T	37	0	37	27	0	27	29.3	37.3	29.4	C					31.9	0.0	31.9	C	29.5	C		
			R	112	1	113	86	0	86	29.5	55.1	29.6	C					29.4	0.0	29.4	C				
			U	0	0	0	0	0	0									0.0	0.0						
	East	Finucane	L	92	2	94	116	0	116	23.0	32.6	23.2	C	41.5	D			18.4	0.0	18.4	B	32.6	C		
			T	1405	31	1436	1295	25	1320	41.0	39.5	41.0	D					30.7	35.6	30.8	C				
			R	71	1	72	90	0	90	75.2	72.2	75.2	E					76.5	0.0	76.5	E				
			U	0	0	0	0	0	0									0.0	0.0						
	North	McDonald	L	244	2	246	101	0	101	14.9	3.2	14.8	B	18.2	B			15.4	0.0	15.4	B	21.1	C		
			T	30	2	32	34	0	34	26.9	58.5	29.1	C					27.4	0.0	27.4	C				
			R	50	1	51	43	0	43	27.2	75.8	27.9	C					29.6	0.0	29.6	C				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Finucane	L	31	1	32	52	4	56	13.4	36.6	14.1	B	33.3	C			12.8	41.8	14.7	B	30.5	C		
			T	1270	47	1317	1519	13	1532	33.5	37.7	33.7	C					31.1	27.9	31.1	C				
			R	9	2	11	14	0	14	28.9	71.4	38.0	D					29.5	0.0	29.5	C				
			U	0	0	0	0	0	0									0.0	0.0						
2 Finucane / Dawson	East	Finucane	L	0	0	0	0	0	0					3.5	A	3.1	A	0.0	0.0			4.1	A	3.2	A
			T	1548	32	1579	1487	25	1512	1.8	2.6	1.8	A					1.8	3.0	1.9	A				
			R	113	3	115	146	8	154	27.2	41.7	27.5	D					25.6	31.5	26.0	D				
			U	0	0	0	0	0	0									0.0	0.0						
	North	Dawson	L	83	0	83	44	0	44	8.5	6.4	8.4	A	12.0	B			5.8	0.0	5.8	A	9.7	A		
			T	0	0	0	0	0	0									0.0	0.0						
			R	29	2	30	19	0	19	20.3	44.5	21.7	C					18.7	0.0	18.7	C				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Finucane	L	0	0	0	0	0	0					2.0	A			0.0	0.0			2.0	A		
			T	1623	50	1673	1712	13	1725	2.0	3.2	2.0	A					2.0	3.1	2.0	A				
			R	0	0	0	0	0	0									0.0	0.0						
			U	0	0	0	0	0	0									0.0	0.0						
3 Finucane / Delancey	South	Delancey	L	610	0	610	587	0	587	22.2		22.2	C	47.0	D	58.0	E	10.2	0.0	10.2	B	20.1	C	35.7	D
			T	168	0	168	156	0	156	135.7		135.7	F					56.1	0.0	56.1	F				
			R	22	0	22	20	0	20	54.6		54.6	D					30.3	0.0	30.3	C				
			U	0	0	0	0	0	0									0.0	0.0						
	East	Finucane	L	26	0	26	37	0	37	75.2		75.2	E	104.1	F			62.1	0.0	62.1	E	45.8	D		
			T	739	31	770	798	32	830	84.2	99.9	84.9	F					42.5	48.8	42.7	D				
			R	147	4	150	71	3	74	206.4	235.2	207.1	F					75.4	65.0	75.0	E				
			U	0	0	0	31	0	31	151.0		151.0	F					40.5	0.0	40.5	D				
	North	Delancey	L	70	3	73	60	1	61	28.6	75.0	30.5	C	44.8	D			33.1	25.8	33.0	C	52.8	D		
			T	116	0	116	107	0	107	47.2		47.2	D					58.8	0.0	58.8	E				
			R	251	5	256	146	2	148	47.0	89.5	47.8	D					55.7	135.7	56.6	E				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Finucane	L	161	12	173	175	1	176	10.7	22.0	11.5	B	40.5	D			8.9	3.3	8.9	A	33.8	C		
			T	1171	39	1210	1186	12	1198	35.7	36.5	35.7	D					29.0	29.3	29.0	C				
			R	275	0	275	352	0	352	79.7		79.7	E					62.7	0.0	62.7	E				
			U	0	0	0	0	0	0									0.0	0.0						
4 Finucane / Wellington	South	Wellington	L	36	12	47	64	9	73	26.1	18.0	24.1	C	17.1	B	29.1	C	14.8	22.1	15.7	B	17.9	B	24.4	C
			T	157	3	160	180	1	181	15.3	23.6	15.5	B					16.4	17.6	16.4	B				
			R	76	3	80	115	2	118	14.9	42.9	16.1	B					20.8	55.3	21.5	C				
			U	0	0	0	0	0	0									0.0	0.0						
	East	Finucane	L	102	1	104	85	0	86	35.8	17.6	35.6	D	46.1	D			15.0	3.7	14.9	B	30.5	C		
			T	619	14	633	671	20	690	44.2	39.8	44.1	D					29.7	32.7	29.8	C				
			R	207	4	210	267	2	269	57.1	69.1	57.3	E					37.4	31.6	37.3	D				
			U	0	0	0	0	0	0									0.0	0.0						
	North	Wellington	L	271	4	275	213	2	215	18.0	25.5	18.1	B	25.1	C			12.5	8.2	12.5	B	15.7	B		
			T	391	12	403	259	5	263	27.8	25.9	27.7	C					8.5	20.7	8.7	A				
			R	209	3	211	205	3	208	29.1	34.5	29.1	C					27.8	37.9	27.9	C				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Finucane	L	132	3	135	194	1	194	8.8	25.9	9.2	A	22.1	C			10.4	17.9	10.5	B	26.0	C		
			T	771	15	786	695	5	700	20.7	24.4	20.7	C					24.1	38.7	24.2	C				
			R	398	24	392	400	7	407	29.0	32.4	29.2	C					36.5	38.5	36.5	D				
			U	0	0	0	0	0	0									0.0	0.0						
5 Wellington / Russell	South	Wellington	L	382	0	382	429	0	429	51.9		51.9	D	49.6	D	80.3	F	58.2	0.0	58.2	E	52.2	D	54.4	E
			T	264	17	282	325	10	335	46.2	53.6	46.7	D					46.5	46.9	46.5	D				
			R	76	2	79	57	0	57	47.0	107.2	48.8	D					39.7	0.0	39.7	D				
			U	0	0	0	0	0	0									0.0	0.0						
	East	Russell	L	36	0	37	45	3	48	86.4	154.2	87.2	F	182.5	F			33.8	90.8	37.3	D	75.9	E		
			T	359	0	359	213	0	213	180.1		180.1	F					70.3	0.0	70.3	E				
			R	50	6	56	149	6	155	260.4	256.4	260.0	F					95.6	94.8	95.6	F				
			U	0	0	0	0	0	0									0.0	0.0						
	North	Wellington	L	161	5	166	196	0	196	47.3	49.8	47.4	D	52.3	D			47.1	43.2	47.1	D	44.8	D		
			T	587	33	620	527	12	539	47.2	48.7	47.3	D					41.9	44.3	42.0	D				
			R	50	0	50	22	0	22	130.7		130.7	F					92.0	0.0	92.0	F				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Russell	L	8	0	8	30	0	30	74.7		74.7	E	80.6	F			27.4	0.0	27.4	C	54.5	D		
			T	79	0	79	89	0	89	66.0		66.0	E					51.8	0.0	51.8	D				
			R	285	0	285	317	0	317	84.9		84.9	F					57.8	0.0	57.8	E				
			U	0	0	0	0	0	0									0.0	0.0						
6 Wellington / Freeth	South	Wellington	L	38	2	40	64	1	65	3.1	7.3	3.3	A	1.8	A	3.9	A	3.3	7.5	3.4	A	2.0	A	3.9	A
			T	443	8	451	561	3	564	1.6	7.0	1.7	A					1.8	6.8	1.8	A				
			R	16	0	16	19	0	19	1.5		1.5	A					1.7	0.0	1.7	A				
			U	0			0	0	0									0.0	0.0						
	East	Freeth	L	14	0	14	29	0	29	6.5		6.5	A	6.0	A			3.6	0.0	3.6	A	3.6	A		
			T	2	0	2	6	0	6	3.1		3.1	A					4.4	0.0	4.4	A				
			R	0	0	0	5	0	5									2.1	0.0	2.1	A				
			U	0			0	0	0									0.0	0.0						
	North	Wellington	L	3	0	3	3	0	3	2.3		2.3	A	4.6	A			2.3	0.0	2.3	A	4.4	A		
			T	645	10	655	433	6	439	4.6	5.9	4.6	A					4.4	6.1	4.4	A				
			R	49	0	49	81	0	82	4.5	3.5	4.5	A					4.1	13.2	4.2	A				
			U	0			0	0	0									0.0	0.0						
	West	Freeth	L	43	2	45	82	0	83	4.8	4.4	4.8	A	5.8	A			7.6	20.2	7.6	A	7.1	A		
			T	11	0	11	16	0	16	5.4		5.4	A					6.5	0.0	6.5	A				
			R	220	9	228	215	4	219	6.0	6.2	6.0	A					6.9	8.3	7.0	A				
			U	0			0	0	0									0.0	0.0						
7 Delancey / Freeth	South	Delancey	L	0	0	0	0	0	0					0.9	A	56.8	F	0.0	0.0			0.9	A	6.9	A
			T	415	12	427	328	1	328	0.5	0.1	0.5	A					0.5	0.2	0.5	A				
			R	97	5	102	185	4	189	2.5	2.5	2.5	A					1.6	2.6	1.6	A				
			U	0	0	0	0	0	0									0.0	0.0						
	East	Freeth	L	68	0	68	121	1	122	501.5	18.9	500.1	F	397.1	F			28.8	55.9	29.1	D	26.4	D		
			T	0	0	0	0	0	0									0.0	0.0						
			R	30	2	32	46	0	47	182.1	102.0	177.6	F					17.4	243.8	19.4	C				
			U	0	0	0	0	0	0									0.0	0.0						
	North	Delancey	L	179	7	185	145	1	146	23.6	65.7	25.1	D	49.6	E			3.6	52.5	4.0	A	6.4	A		
			T	420	8	427	240	1	241	60.2	59.6	60.2	E					8.0	0.3	7.9	A				
			R	0	0	0	0	0	0									0.0	0.0						
			U	0	0	0	0	0	0									0.0	0.0						
8 Delancey / Arthur	South	Delancey	L	87	0	87	61	2	63	2.3		2.3	A	0.6	A	12.9	B	2.1	3.4	2.1	A	0.4	A	8.5	A
			T	384	16	400	337	1	338	0.2	0.3	0.2	A					0.1	0.4	0.1	A				
			R	4	0	4	9	0	9	3.0		3.0	A					1.4	0.0	1.4	A				
			U	0	0	0	0	0	0									0.0	0.0						
	East	Arthur	L	3	0	3	6	0	6	74.0		74.0	F	46.4	E			36.1	0.0	36.1	E	34.7	D		
			T	0	0	0	0	0	0									0.0	0.0						
			R	4	0	4	3	0	3	26.3		26.3	D					32.1	0.0	32.1	D				
			U	0	0	0	0	0	0									0.0	0.0						
	North	Delancey	L	0	0	0	1	0	1	0.9		0.9	A	26.1	D			14.1	0.0	14.1	B	18.5	C		
			T	422	8	430	301	2	303	23.9	46.3	24.3	C					16.7	33.6	16.8	C				
			R	72	0	72	63	0	63	36.8		36.8	E					26.5	11.1	26.4	D				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Site Access	L	123	0	123	172	3	175	6.2		6.2	A	6.2	A			5.3	3.4	5.3	A	5.3	A		
			T	0	0	0	0	0	0									0.0	0.0						
			R	0	0	0	0	0	0									0.0	0.0						
			U	0	0	0	0	0	0									0.0	0.0						
9 Finucane / Development access	East	Finucane	L	0	0	0	0	0	0					6.7	A	11.4	B	0.0	0.0			10.1	B	13.5	B
			T	1489	36	1524	1408	34	1442	3.9	6.7	3.9	A					5.2	9.8	5.3	A				
			R	141	0	141	124	0	124	36.5		36.5	D					65.2	0.0	65.2	E				
			U	0	0	0	0	0	0									0.0	0.0						
	North	Development	L	133	0	133	171	0	171	21.4		21.4	C	28.1	C			17.1	0.0	17.1	B	22.2	C		
			T	0	0	0	0	0	0									0.0	0.0						
			R	184	0	184	228	0	228	32.9		32.9	C					25.9	0.0	25.9	C				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Finucane	L	230	0	230	189	0	189	5.0		5.0	A	12.8	B			5.7	0.0	5.7	A	14.5	B		
			T	1489	50	1540	1541	12	1553	13.5	28.4	14.0	B					15.4	39.4	15.6	B				
			R	0	0	0	0	0	0									0.0	0.0						
			U	0	0	0	0	0	0									0.0	0.0						

SCENARIO 4: BACKGROUND TRAFFIC WITH DEVELOPMENT – UPGRADE 2

			Modelled Volumes - with Development traffic						Level of Service with Development Traffic - Upgrade 2															
			AM Peak			PM Peak			AM Peak - Delays								PM Peak - Delays							
Intersection	Approach	Description	Turn	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Turn	LOS	Approach	LOS	Intersection	LOS	Light	Heavy	Turn	LOS	Approach	LOS	Intersection	LOS
1 Finucane / McDonald	South	McDonald	L	4	1	5	12	2	14	22.4	51.8	28.9	C	28.9	C	34.2	C	18.7	56.1	23.5	C	29.3	C	30.6	C
			T	31	0	31	27	0	27	29.5		29.5	C					29.6	0.0	29.6	C				
			R	101	2	102	87	0	87	28.0	72.6	28.7	C					30.1	0.0	30.1	C				
			U	0	0	0	0	0	0									0.0	0.0						
	East	Finucane	L	95	2	97	116	0	116	23.4	59.8	24.0	C	39.5	D			18.7	36.5	18.7	B	31.5	C		
			T	1401	32	1432	1294	25	1319	38.7	42.8	38.8	D					29.9	33.8	30.0	C				
			R	69	1	70	91	0	91	74.5	101.4	74.8	E					70.5	0.0	70.5	E				
			U	0	0	0	0	0	0									0.0	0.0						
	North	McDonald	L	256	2	258	101	0	101	16.3	13.9	16.3	B	19.3	B			17.0	0.0	17.0	B	22.6	C		
			T	29	2	32	34	0	34	30.1	54.3	31.7	C					29.2	0.0	29.2	C				
			R	44	1	45	43	0	43	27.3	64.7	27.9	C					30.7	0.0	30.7	C				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Finucane	L	31	1	32	52	4	56	12.8	28.9	13.3	B	32.3	C			13.2	30.0	14.3	B	30.6	C		
			T	1296	47	1343	1512	13	1525	32.7	33.3	32.7	C					31.2	35.2	31.2	C				
			R	7	2	9	14	0	14	26.1	65.2	36.3	D					29.7	0.0	29.7	C				
			U	0	0	0	0	0	0									0.0	0.0						
2 Finucane / Dawson	East	Finucane	L	0	0	0	0	0	0					3.7	A	3.1	A	0.0	0.0			4.2	A	3.3	A
			T	1554	32	1586	1493	26	1518	1.8	2.8	1.8	A					1.8	2.9	1.8	A				
			R	107	3	110	148	9	157	30.9	46.1	31.3	D					27.1	24.0	26.9	D				
			U	0	0	0	0	0	0									0.0	0.0						
	North	Dawson	L	85	0	86	44	0	44	7.7	13.4	7.7	A	11.1	B			8.8	0.0	8.8	A	11.6	B		
			T	0	0	0	0	0	0									0.0	0.0						
			R	25	2	27	19	0	19	19.6	55.5	22.0	C					18.1	0.0	18.1	C				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Finucane	L	0	0	0	0	0	0					2.0	A			0.0	0.0			2.1	A		
			T	1659	51	1710	1706	13	1719	2.0	3.0	2.0	A					2.1	2.8	2.1	A				
			R	0	0	0	0	0	0									0.0	0.0						
			U	0	0	0	0	0	0									0.0	0.0						
3 Finucane / Delancey	South	Delancey	L	601	0	601	615	0	615	21.8		21.8	C	42.8	D	48.6	D	9.5	0.0	9.5	A	22.9	C	32.0	C
			T	148	0	148	126	0	126	126.8		126.8	F					83.9	0.0	83.9	F				
			R	20	0	20	24	0	24	48.8		48.8	D					45.8	0.0	45.8	D				
			U	0	0	0	0	0	0									0.0	0.0						
	East	Finucane	L	13	0	13	1	0	1	99.0		99.0	F	66.1	E			6.7	0.0	6.7	A	29.9	C		
			T	693	30	723	732	32	764	49.0	58.7	49.4	D					25.4	29.0	25.6	C				
			R	106	3	109	70	2	72	155.3	303.4	159.1	F					72.8	100.8	73.6	E				
			U	8	0	8	23	0	23	258.4	110.6	254.9	F					39.2	0.0	39.2	D				
	North	Delancey	L	77	4	82	66	1	67	20.0	45.2	21.3	C	28.6	C			22.7	63.3	23.3	C	36.3	D		
			T	162	0	162	159	0	159	29.5		29.5	C					38.8	0.0	38.8	D				
			R	300	5	305	185	2	188	29.4	67.2	30.1	C					38.2	86.6	38.8	D				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Finucane	L	170	14	183	204	1	205	15.8	33.5	17.1	B	48.9	D			9.2	44.6	9.3	A	36.0	D		
			T	1200	39	1238	1164	12	1175	45.5	47.7	45.6	D					30.6	30.8	30.6	C				
			R	284	0	284	331	0	331	84.2		84.2	F					71.5	0.0	71.5	E				
			U	0	0	0	0	0	0									0.0	0.0						
4 Finucane / Wellington	South	Wellington	L	49	8	57	100	12	112	31.2	21.3	29.8	C	18.7	B	31.9	C	12.0	19.3	12.8	B	13.8	B	21.2	C
			T	219	4	223	220	1	221	15.6	25.0	15.7	B					15.1	10.5	15.1	B				
			R	0	4	4	119	2	121		23.3	23.3	C					12.3	24.2	12.5	B				
			U	0	0	0	0	0	0									0.0	0.0						
	East	Finucane	L	86	2	88	74	0	75	25.1	18.0	25.0	C	45.4	D			11.2	18.3	11.3	B	24.1	C		
			T	591	14	605	684	18	703	41.8	43.3	41.8	D					24.4	29.3	24.5	C				
			R	224	4	228	267	3	271	63.3	45.2	62.9	E					26.8	17.5	26.6	C				
			U	0	0	0	0	0	0									0.0	0.0						
	North	Wellington	L	307	4	311	207	2	210	16.5	18.9	16.5	B	23.7	C			10.9	13.9	10.9	B	12.1	B		
			T	354	12	366	257	4	261	29.1	25.5	28.9	C					10.8	11.6	10.8	B				
			R	110	2	112	102	2	104	26.8	26.8	26.8	C					17.5	21.9	17.6	B				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Finucane	L	111	3	114	154	0	154	29.2	19.9	29.0	C	30.1	C			10.3	15.4	10.3	B	25.6	C		
			T	821	15	836	692	5	697	28.8	32.4	28.9	C					24.3	30.5	24.3	C				
			R	367	25	392	437	7	445	32.6	39.8	33.0	C					32.9	37.6	32.9	C				
			U	0	0	0	0	0	0									0.0	0.0						
5 Wellington / Russell	South	Wellington	L	385	0	385	426	0	426	53.6		53.6	D	51.6	D	77.7	E	63.3	0.0	63.3	E	56.0	E	50.6	D
			T	244	18	261	327	10	337	47.3	48.8	47.4	D					49.2	59.2	49.4	D				
			R	68	3	71	58	0	58	54.7	105.4	56.5	E					40.8	0.0	40.8	D				
			U	0	0	0	0	0	0									0.0	0.0						
	East	Russell	L	36	1	36	44	3	47	86.3	216.4	88.5	F	166.7	F			31.0	70.8	33.5	C	58.3	E		
			T	334	0	334	199	0	199	162.7		162.7	F					55.5	0.0	55.5	E				
			R	80	7	86	162	6	168	212.8	244.3	215.2	F					68.7	69.3	68.7	E				
			U	0	0	0	0	0	0									0.0	0.0						
	North	Wellington	L	148	5	153	202	0	202	48.5	47.7	48.5	D	44.5	D			39.0	62.9	39.0	D	39.0	D		
			T	586	33	619	530	12	542	40.1	47.6	40.5	D					38.5	45.4	38.7	D				
			R	29	0	29	38	0	38	107.0		107.0	F					43.5	0.0	43.5	D				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Russell	L	31	0	31	50	0	50	96.0		96.0	F	89.0	F			28.3	0.0	28.3	C	53.6	D		
			T	82	0	82	82	0	82	65.3		65.3	E					52.0	0.0	52.0	D				
			R	293	0	293	309	0	309	94.9		94.9	F					58.1	0.0	58.1	E				
			U	0	0	0	0	0	0									0.0	0.0						
6 Wellington / Freeth	South	Wellington	L	110	3	113	92	2	94	3.7	5.2	3.8	A	2.1	A	3.3	A	3.4	5.5	3.4	A	2.0	A	2.8	A
			T	428	8	436	534	3	537	1.7	6.4	1.7	A					1.7	5.5	1.7	A				
			R	15	0	15	17	0	17	1.8		1.8	A					1.6	0.0	1.6	A				
			U	0		0	0	0	0									0.0	0.0						
	East	Freeth	L	12	0	12	29	0	29	6.0		6.0	A	5.1	A			4.0	0.0	4.0	A	3.6	A		
			T	4	0	4	7	0	7	2.5		2.5	A					3.2	0.0	3.2	A				
			R	0	0	0	5	0	5									1.7	0.0	1.7	A				
			U	0		0	0	0	0									0.0	0.0						
	North	Wellington	L	3	0	3	3	0	3	2.7		2.7	A	3.9	A			0.9	0.0	0.9	A	2.7	A		
			T	629	10	639	455	6	461	4.0	4.5	4.0	A					2.7	4.0	2.7	A				
			R	73	0	73	61	1	61	3.5	7.1	3.5	A					3.1	6.7	3.1	A				
			U	0		0	0	0	0									0.0	0.0						
	West	Freeth	L	60	2	62	108	1	108	4.2	4.2	4.2	A	4.2	A			5.2	8.0	5.2	A	5.4	A		
			T	12	0	12	17	0	17	2.8		2.8	A					7.2	0.0	7.2	A				
			R	134	8	142	86	3	89	4.1	6.4	4.3	A					5.3	5.5	5.3	A				
			U	0		0	0	0	0									0.0	0.0						
7 Delancey / Freeth	South	Delancey	L	0	0	0	0	0	0					0.7	A	22.4	C	0.0	0.0			0.5	A	3.7	A
			T	362	11	373	305	0	305	0.5	0.3	0.5	A					0.4	0.3	0.4	A				
			R	117	6	122	206	4	210	1.3	0.3	1.2	A					0.6	1.5	0.6	A				
			U	0	0	0	0	0	0									0.0	0.0						
	East	Freeth	L	106	0	106	99	2	100	133.5	54.9	133.3	F	108.2	F			15.6	15.2	15.6	C	12.6	B		
			T	0	0	0	0	0	0									0.0	0.0						
			R	84	3	87	71	1	72	73.7	185.1	77.6	F					8.3	12.3	8.4	A				
			U	0	0	0	0	0	0									0.0	0.0						
	North	Delancey	L	92	5	96	14	0	14	6.9	24.3	7.8	A	13.1	B			4.2	1.1	4.2	A	4.0	A		
			T	526	9	535	370	2	373	14.2	9.3	14.1	B					4.0	4.8	4.0	A				
			R	0	0	0	0	0	0									0.0	0.0						
			U	0	0	0	0	0	0									0.0	0.0						
8 Delancey / Arthur	South	Delancey	L	70	0	70	55	2	57	2.2		2.2	A	0.5	A	7.3	A	2.0	3.2	2.1	A	0.4	A	5.9	A
			T	350	16	366	336	1	337	0.1	0.4	0.1	A					0.1	0.5	0.1	A				
			R	4	0	4	7	0	7	2.2		2.2	A					1.9	0.0	1.9	A				
			U	0	0	0	0	0	0									0.0	0.0						
	East	Arthur	L	7	0	7	8	0	8	31.8		31.8	D	28.8	D			37.0	0.0	37.0	E	37.1	E		
			T	0	0	0	0	0	0									0.0	0.0						
			R	4	0	4	1	0	1	23.3		23.3	C					37.9	0.0	37.9	E				
			U	0	0	0	0	0	0									0.0	0.0						
	North	Delancey	L	2	0	2	2	0	2	9.8		9.8	A	12.0	B			5.8	0.0	5.8	A	10.3	B		
			T	524	10	534	399	3	402	10.7	20.2	10.9	B					8.7	35.5	8.9	A				
			R	100	0	100	69	1	69	17.8		17.8	C					18.6	37.2	18.7	C				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Site Access	L	126	0	126	172	3	176	5.4		5.4	A	5.4	A			5.1	7.0	5.1	A	5.1	A		
			T	0	0	0	0	0	0									0.0	0.0						
			R	0	0	0	0	0	0									0.0	0.0						
			U	0	0	0	0	0	0									0.0	0.0						
9 Finucane / Development access	East	Finucane	L	0	0	0	0	0	0					11.3	B	13.1	B	0.0	0.0			10.2	B	13.1	B
			T	1479	35	1514	1408	34	1442	4.3	8.4	4.4	A					5.1	10.7	5.2	A				
			R	141	0	141	125	0	125	85.9		85.9	F					67.8	0.0	67.8	E				
			U	0	0	0	0	0	0									0.0	0.0						
	North	Development	L	132	0	132	171	0	171	21.5		21.5	C	28.0	C			17.2	0.0	17.2	B	22.2	C		
			T	0	0	0	0	0	0									0.0	0.0						
			R	184	0	184	228	0	228	32.7		32.7	C					25.9	0.0	25.9	C				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Finucane	L	230	0	230	191	0	191	4.8		4.8	A	12.2	B			5.0	0.0	5.0	A	13.7	B		
			T	1519	51	1571	1542	12	1554	12.8	28.4	13.3	B					14.6	33.3	14.7	B				
			R	0	0	0	0	0	0									0.0	0.0						
			U	0	0	0	0	0	0									0.0	0.0						

SCENARIO 5: BACKGROUND TRAFFIC WITH DEVELOPMENT – UPGRADE 3

			Modelled Volumes - with Development traffic						Level of Service with Development Traffic - Upgrade 3															
			AM Peak			PM Peak			AM Peak - Delays								PM Peak - Delays							
Intersection	Approach	Description	Turn	Light	Heavy	Total	Light	Heavy	Total	Light	Heavy	Turn	LOS	Approach	LOS	Intersection	LOS	Light	Heavy	Turn	LOS	Approach	LOS	Intersection	LOS
1 Finucane / McDonald	South	McDonald	L	4	1	5	12	2	14	17.8	47.1	24.3	C	27.3	C	33.7	C	20.8	58.0	25.6	C	29.9	C	31.0	C
			T	32	0	32	27	0	27	27.8	24.5	27.7	C					30.0	0.0	30.0	C				
			R	102	2	104	86	0	86	26.5	75.0	27.3	C					30.6	0.0	30.6	C				
			U	0	0	0	0	0	0									0.0	0.0						
	East	Finucane	L	95	1	97	116	0	116	22.1	53.0	22.5	C	38.0	D			18.1	0.0	18.1	B	32.5	C		
			T	1406	30	1436	1300	25	1325	37.6	40.6	37.7	D					31.0	33.9	31.1	C				
			R	69	1	70	92	0	92	67.2	83.9	67.5	E					70.8	0.0	70.8	E				
			U	0	0	0	0	0	0									0.0	0.0						
	North	McDonald	L	256	2	258	101	0	101	15.0	7.5	14.9	B	18.2	B			16.0	0.0	16.0	B	22.0	C		
			T	30	2	32	34	0	34	30.4	65.4	32.8	C					31.1	0.0	31.1	C				
			R	44	1	45	43	0	43	26.1	54.7	26.6	C					28.5	0.0	28.5	C				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Finucane	L	30	1	31	53	4	56	13.3	27.7	13.8	B	33.1	C			12.6	40.1	14.4	B	30.6	C		
			T	1289	47	1336	1521	13	1534	33.5	34.6	33.6	C					31.2	34.9	31.3	C				
			R	7	2	9	14	0	14	23.7	66.4	35.1	D					28.4	0.0	28.4	C				
			U	0	0	0	0	0	0									0.0	0.0						
2 Finucane / Dawson	East	Finucane	L	0	0	0	0	0	0					3.6	A	3.2	A	0.0	0.0			4.4	A	3.4	A
			T	1562	32	1594	1491	26	1517	1.7	2.7	1.8	A					1.9	3.0	1.9	A				
			R	110	3	113	147	9	156	29.8	29.5	29.8	D					29.1	31.7	29.2	D				
			U	0	0	0	0	0	0									0.0	0.0						
	North	Dawson	L	86	0	86	44	0	44	8.6	9.5	8.6	A	11.5	B			6.5	0.0	6.5	A	10.6	B		
			T	0	0	0	0	0	0									0.0	0.0						
			R	25	2	27	19	0	19	19.2	42.4	20.8	C					20.1	0.0	20.1	C				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Finucane	L	0	0	0	0	0	0					2.1	A			0.0	0.0			2.2	A		
			T	1651	51	1701	1711	13	1724	2.1	3.2	2.1	A					2.2	2.9	2.2	A				
			R	0	0	0	0	0	0									0.0	0.0						
			U	0	0	0	0	0	0									0.0	0.0						
3 Finucane / Delancey	South	Delancey	L	637	0	637	538	0	538	19.6		19.6	B	42.2	D	49.5	D	8.6	0.0	8.6	A	21.5	C	33.4	C
			T	150	0	150	126	0	126	135.8		135.8	F					73.8	0.0	73.8	E				
			R	18	0	18	18	0	18	59.8		59.8	F					43.2	0.0	43.2	D				
			U	0	0	0	0	0	0									0.0	0.0						
	East	Finucane	L	11	0	11	5	0	5	253.9		253.9	F	63.1	E			14.4	0.0	14.4	B	30.6	C		
			T	667	30	697	786	31	818	45.3	51.1	45.5	D					24.8	31.0	25.0	C				
			R	120	3	123	80	2	82	140.0	219.1	142.2	F					81.0	132.7	82.4	F				
			U	4	0	4	26	0	26	161.7		161.7	F					45.1	0.0	45.1	D				
	North	Delancey	L	77	5	82	44	1	45	19.9	40.1	21.2	C	28.4	C			22.2	4.4	21.9	C	35.3	D		
			T	162	0	162	160	0	160	29.4		29.4	C					37.1	0.0	37.1	D				
			R	299	5	304	206	2	208	29.4	56.0	29.9	C					36.5	68.5	36.8	D				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Finucane	L	181	13	193	170	1	170	17.9	38.5	19.3	B	53.0	D			9.3	34.8	9.4	A	39.3	D		
			T	1182	39	1221	1187	12	1199	51.5	53.3	51.5	D					30.8	28.5	30.8	C				
			R	286	0	286	350	0	350	82.3		82.3	F					82.9	0.0	82.9	F				
			U	0	0	0	0	0	0									0.0	0.0						
4 Finucane / Wellington	South	Wellington	L	30	10	40	99	9	107	33.7	18.3	30.0	C	16.4	B	24.7	C	23.2	18.5	22.9	C	19.1	B	20.6	C
			T	222	4	226	206	1	207	13.6	22.2	13.8	B					18.3	20.9	18.3	B				
			R	0	4	4	118	2	121		27.8	27.8	C					16.8	35.6	17.2	B				
			U	0	0	0	0	0	0									0.0	0.0						
	East	Finucane	L	79	2	80	75	0	75	29.0	13.5	28.7	C	31.4	C			9.2	5.8	9.1	A	22.8	C		
			T	606	14	619	684	18	702	29.4	30.4	29.4	C					21.4	25.1	21.5	C				
			R	221	4	225	266	3	269	38.0	39.5	38.0	D					30.0	25.7	29.9	C				
			U	0	0	0	0	0	0									0.0	0.0						
	North	Wellington	L	308	4	312	212	3	215	12.9	13.6	12.9	B	17.6	B			9.2	12.1	9.2	A	9.7	A		
			T	357	10	367	235	4	239	20.6	25.7	20.8	C					6.3	13.2	6.4	A				
			R	113	2	115	127	2	130	20.6	18.6	20.6	C					16.3	30.6	16.6	B				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Finucane	L	92	3	95	194	1	195	26.9	21.2	26.7	C	26.0	C			9.4	22.3	9.4	A	24.1	C		
			T	826	15	840	689	5	694	25.0	25.8	25.0	C					23.0	28.0	23.1	C				
			R	370	28	398	398	7	406	28.0	29.1	28.0	C					32.9	37.7	33.0	C				
			U	0	0	0	0	0	0									0.0	0.0						
5 Wellington / Russell	South	Wellington	L	408	0	408	395	0	395	52.4		52.4	D	50.2	D	77.6	E	61.1	0.0	61.1	E	53.9	D	50.2	D
			T	223	18	241	361	10	371	45.6	48.1	45.8	D					48.1	53.1	48.2	D				
			R	69	2	71	56	0	56	50.2	102.9	52.0	D					40.9	0.0	40.9	D				
			U	0	0	0	0	0	0									0.0	0.0						
	East	Russell	L	36	1	36	44	3	47	82.1	269.2	85.2	F	170.6	F			30.8	75.7	33.7	C	63.1	E		
			T	349	0	349	191	0	191	164.9		164.9	F					62.4	0.0	62.4	E				
			R	63	7	70	168	6	174	244.5	230.3	243.1	F					71.3	80.3	71.6	E				
			U	0	0	0	0	0	0									0.0	0.0						
	North	Wellington	L	156	5	161	195	0	196	44.0	53.1	44.3	D	46.9	D			41.9	26.0	41.9	D	41.8	D		
			T	565	34	599	517	12	528	45.1	51.4	45.4	D					41.7	42.4	41.8	D				
			R	18	0	18	0	0	0	120.8		120.8	F					38.9	0.0	38.9	D				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Russell	L	9	0	9	48	0	48	44.4		44.4	D	80.6	F			27.3	0.0	27.3	C	45.5	D		
			T	77	0	77	91	0	91	57.2		57.2	E					48.6	0.0	48.6	D				
			R	317	0	317	330	0	330	87.3		87.3	F					47.3	0.0	47.3	D				
			U	0	0	0	0	0	0									0.0	0.0						
6 Wellington / Freeth	South	Wellington	L	104	3	107	84	2	86	3.9	6.8	4.0	A	2.1	A	3.0	A	3.4	5.7	3.4	A	2.0	A	3.0	A
			T	416	8	424	566	3	569	1.6	5.9	1.7	A					1.8	7.1	1.8	A				
			R	15	0	15	18	0	18	1.5		1.5	A					1.7	0.0	1.7	A				
			U	0			0	0	0									0.0	0.0						
	East	Freeth	L	12	0	12	28	0	28	5.1		5.1	A	4.3	A			3.5	0.0	3.5	A	3.2	A		
			T	4	0	4	7	0	7	2.0		2.0	A					3.2	0.0	3.2	A				
			R	0	0	0	6	0	6									1.9	0.0	1.9	A				
			U	0			0	0	0									0.0	0.0						
	North	Wellington	L	3	0	3	3	0	3	1.4		1.4	A	3.3	A			1.9	0.0	1.9	A	3.1	A		
			T	633	10	644	430	6	436	3.2	4.5	3.2	A					3.0	4.7	3.0	A				
			R	69	0	69	85	0	86	3.9		3.9	A					3.6	1.9	3.6	A				
			U	0			0	0	0									0.0	0.0						
	West	Freeth	L	73	2	75	76	0	76	4.1	5.0	4.1	A	4.2	A			5.7	4.3	5.7	A	5.5	A		
			T	12	0	12	16	0	16	4.5		4.5	A					5.8	0.0	5.8	A				
			R	134	6	139	118	3	121	4.2	5.0	4.2	A					5.3	6.8	5.4	A				
			U	0			0	0	0									0.0	0.0						
7 Delancey / Freeth	South	Delancey	L	0	0	0	0	0	0					0.6	A	23.0	C	0.0	0.0			0.6	A	2.2	A
			T	367	11	378	312	0	312	0.5	0.2	0.5	A					0.4	0.0	0.4	A				
			R	129	5	133	178	4	182	1.1	1.0	1.1	A					0.8	2.1	0.8	A				
			U	0	0	0	0	0	0									0.0	0.0						
	East	Freeth	L	97	0	97	126	1	127	136.9		136.9	F	100.5	F			8.8	12.1	8.8	A	8.3	A		
			T	0	0	0	0	0	0									0.0	0.0						
			R	86	2	88	63	1	64	59.4	96.9	60.5	F					7.0	12.9	7.1	A				
			U	0	0	0	0	0	0									0.0	0.0						
	North	Delancey	L	89	4	93	43	0	44	12.0	18.9	12.3	B	18.3	C			0.7	1.2	0.7	A	1.4	A		
			T	524	11	534	341	2	344	19.3	21.0	19.3	C					1.5	0.1	1.5	A				
			R	0	0	0	0	0	0									0.0	0.0						
			U	0	0	0	0	0	0									0.0	0.0						
8 Delancey / Arthur	South	Delancey	L	78	0	78	56	2	58	2.3		2.3	A	0.5	A	7.6	A	2.1	3.7	2.2	A	0.5	A	4.2	A
			T	367	16	383	315	1	315	0.1	0.4	0.2	A					0.1	0.8	0.1	A				
			R	5	0	5	8	0	8	3.4		3.4	A					1.9	0.0	1.9	A				
			U	0	0	0	0	0	0									0.0	0.0						
	East	Arthur	L	7	0	7	6	0	6	68.3		68.3	F	53.5	F			10.4	0.0	10.4	B	14.7	B		
			T	0	0	0	0	0	0									0.0	0.0						
			R	3	0	3	2	0	2	23.2		23.2	C					27.4	0.0	27.4	D				
			U	0	0	0	0	0	0									0.0	0.0						
	North	Delancey	L	1	0	1	2	0	2	7.0		7.0	A	12.6	B			3.7	0.0	3.7	A	6.7	A		
			T	522	11	533	398	3	401	11.2	28.2	11.5	B					5.8	19.7	5.9	A				
			R	94	0	94	67	0	68	18.5		18.5	C					11.7	13.7	11.7	B				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Site Access	L	126	0	126	173	3	176	5.6		5.6	A	5.6	A			5.1	6.1	5.1	A	5.1	A		
			T	0	0	0	0	0	0									0.0	0.0						
			R	0	0	0	0	0	0									0.0	0.0						
			U	0	0	0	0	0	0									0.0	0.0						
9 Finucane / Development access	East	Finucane	L	0	0	0	0	0	0					11.5	B	22.1	C	0.0	0.0			9.1	A	16.8	B
			T	1492	35	1527	1408	34	1441	4.6	7.8	4.6	A					4.9	10.5	5.0	A				
			R	142	0	142	124	0	124	84.8		84.8	F					56.6	0.0	56.6	E				
			U	0	0	0	0	0	0									0.0	0.0						
	North	Development	L	133	0	133	171	0	171	28.4		28.4	C	31.0	C			17.1	0.0	17.1	B	22.1	C		
			T	0	0	0	0	0	0									0.0	0.0						
			R	184	0	184	228	0	228	32.9		32.9	C					25.9	0.0	25.9	C				
			U	0	0	0	0	0	0									0.0	0.0						
	West	Finucane	L	230	0	230	190	0	190	5.1		5.1	A	33.1	C			5.3	0.0	5.3	A	24.5	C		
			T	1085	39	1124	1071	12	1083	37.3	83.0	38.9	D					27.5	65.2	27.9	C				
			R	0	0	0	0	0	0									0.0	0.0						
			U	0	0	0	0	0	0									0.0	0.0						

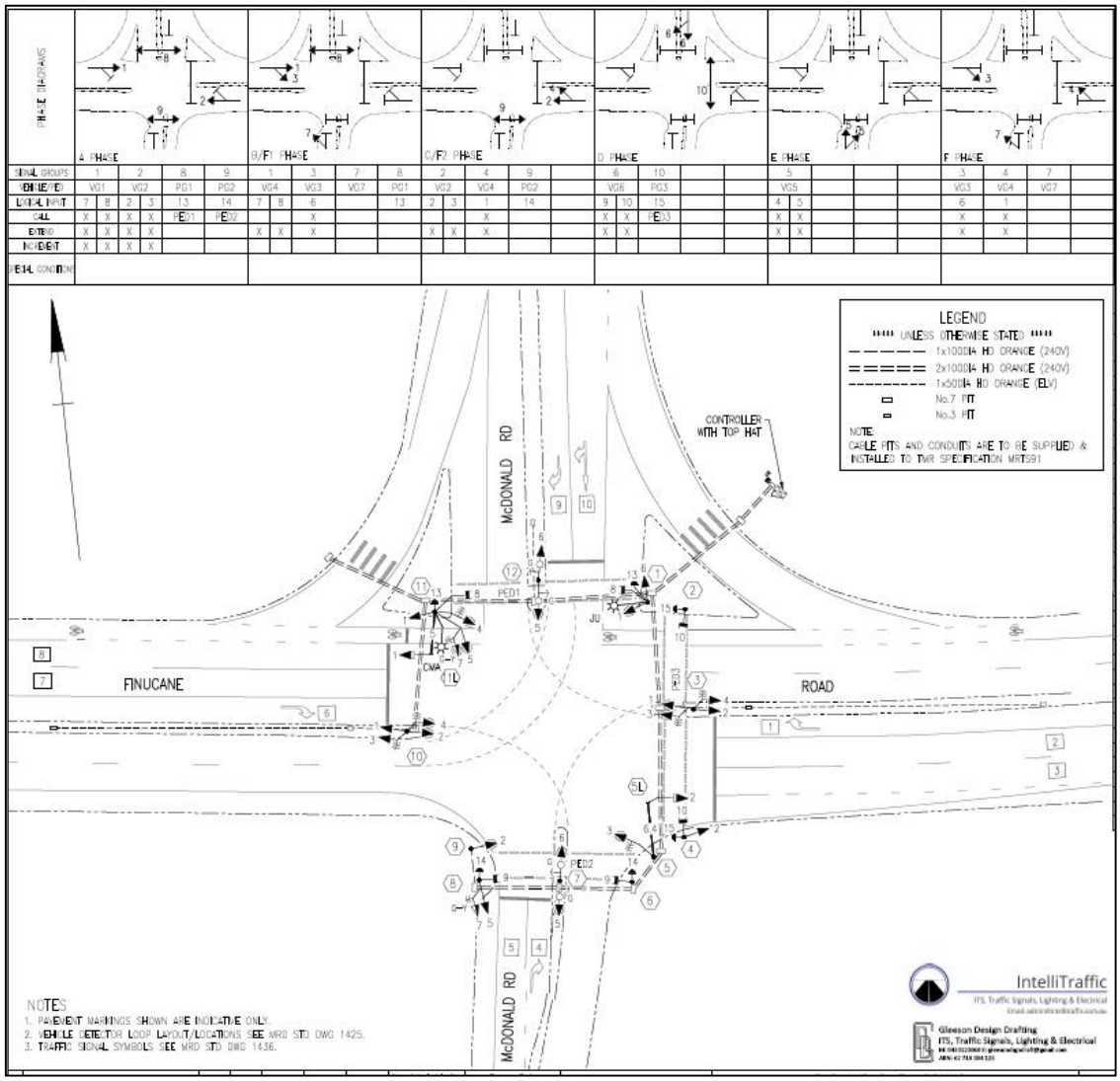
ANNEXURE D – BACKGROUND TRAFFIC NETWORK DELAYS

Background Traffic (Sum of turn volume x delay)	Total Delays (sec)						
	AM			PM			Both peaks
Network Scenario	Light	Heavy	Total	Light	Heavy	Total	All traffic
Scenario 1: Base existing network	610316	18747	629062	524603	7970	532573	1161636
Scenario 2: Base existing network with development	780832	25094	805784	607906	11079	618853	1424637
Scenario 3: Development + Upgrade 1 (lengthen slip-lane)	670379	21410	691710	465789	9046	474789	1166498
Scenario 4: Development + Upgrade 2 (slip lane + dual rights)	595133	20335	615284	425934	7899	433747	1049031
Scenario 5: Development + Upgrade 3 (slip lane + dual rights + re-alignment)	595039	20273	615128	425706	7798	433418	1048546

Background Traffic (Sum of turn volume x delay)	Total Delays (hours						
	AM			PM			Both peaks
Scenario	Light	Heavy	Total	Light	Heavy	Total	All traffic
Scenario 1: Base existing network	170	5	175	146	2	148	323
Scenario 2: Base existing network with development	217	7	224	169	3	172	396
Scenario 3: Development + Upgrade 1 (lengthen slip-lane)	186	6	192	129	3	132	324
Scenario 4: Development + Upgrade 2 (slip lane + dual rights)	165	6	171	118	2	120	291
Scenario 5: Development + Upgrade 3 (slip lane + dual rights + re-alignment)	165	6	171	118	2	120	291

Background traffic % Increase in delay vs Base	AM			PM			Both peaks
Network Scenario	Light	Heavy	Total	Light	Heavy	Total	All traffic
Scenario 2: Base existing network with development	27.9%	33.9%	28.1%	15.9%	39.0%	16.2%	22.6%
Scenario 3: Development + Upgrade 1 (lengthen slip-lane)	9.8%	14.2%	10.0%	-11.2%	13.5%	-10.9%	0.4%
Scenario 4: Development + Upgrade 2 (slip lane + dual rights)	-2.5%	8.5%	-2.2%	-18.8%	-0.9%	-18.6%	-9.7%
Scenario 5: Development + Upgrade 3 (slip lane + dual rights + re-alignment)	-2.5%	8.1%	-2.2%	-18.9%	-2.2%	-18.6%	-9.7%

Annexure E – Finucane Road / Delancey Street Signal Data


PHASE DIAGRAMS
A PHASE
B/F1 PHASE
C/F2 PHASE
D PHASE
E PHASE
F PHASE
SIGNAL GROUPS
VEHICLE/PED
LOGICAL INPUT
CALL
EXTEND
INCREMENT
RETAIL CONDITION
LEGEND
UNLESS OTHERWISE STATED
1x100DIA HD ORANGE (240V)
2x100DIA HD ORANGE (240V)
1x50DIA HD ORANGE (ELV)
No.7 PIT
No.3 PIT
NOTE:
CABLE PITS AND CONDUITS ARE TO BE SUPPLIED & INSTALLED TO TMR SPECIFICATION MRTS91
CONTROLLER WITH TOP HAT
McDONALD RD
FINUCANE
ROAD
PED1
PED2
JU
CMA
TL
NOTES
1. PAVEMENT MARKINGS SHOWN ARE INDICATIVE ONLY.
2. VEHICLE DETECTOR LOOP LAYOUT/LOCATIONS SEE MRD STD DWG 1425.
3. TRAFFIC SIGNAL SYMBOLS SEE MRD STD DWG 1436.
IntelliTraffic
ITS, Traffic Signals, Lighting & Electrical
Gleeson Design Drafting
ITS, Traffic Signals, Lighting & Electrical

AM Peak Signal Data

Intersectio	M1336/CTLR		
Plan:	<Any>		
Start:	Thursday	26 May 20	6:00:00
End:	Thursday	26 May 20	18:00:00
No of Cycle	325		
No of Disca	0		

Day	Time	Cycle No	Cycle Leng	1A	1B	1C	1D	1E	1F	Phase/Stag	1P1WALK	1P2WALK	1P3WALK	Ped Combo	1P1DEMAN	1P2DEMAN	1P3DEMAN	1P1WALK F	1P2WALK F	1P3WALK F	Plan	CT>60	CT<250
4	26/05/2022 6:58	30	120	71			15	15	19	ADEF				None							1336 Plan(	TRUE	TRUE
4	26/05/2022 7:00	31	32	16					16	AF				None							1336 TMR	FALSE	TRUE
4	26/05/2022 7:01	32	169	115			16	19	19	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 7:04	33	157	106			18	16	17	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 7:06	34	164	109			18	20	17	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 7:09	35	165	105			18	20	22	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 7:12	36	152	100			19	16	17	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 7:14	37	143	108			18		17	ADF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 7:17	38	177	125			15	19	18	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 7:20	39	143	108			19		16	ADF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 7:22	40	178	124			17	21	16	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 7:25	41	160	106			15	20	19	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 7:28	42	159	106			18	19	16	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 7:30	43	168	108			15	22	23	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 7:33	44	160	100			17	21	22	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 7:36	45	148	100			15	17	16	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 7:38	46	166	112			18	20	16	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 7:41	47	158	106			18	18	16	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 7:44	48	165	108			18	21	18	ADEF				None	42						1336 TMR	TRUE	TRUE
4	26/05/2022 7:46	49	171	103			36	13	19	ADEF	10		12	1|3			18	1A		1D	1336 TMR	TRUE	TRUE
4	26/05/2022 7:49	50	144	92			18	19	15	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 7:52	51	165	108			15	24	18	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 7:54	52	171	103			36	14	18	ADEF			12	3			42			1D	1336 TMR	TRUE	TRUE
4	26/05/2022 7:57	53	152	92			16	22	22	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 8:00	54	155	100			18	21	16	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 8:02	55	167	105			18	20	24	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 8:05	56	153	98			19	20	16	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 8:08	57	159	105			16	22	16	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 8:10	58	163	106			19	20	18	ADEF		4		2		136			1F		1336 TMR	TRUE	TRUE
4	26/05/2022 8:13	59	171	103			36	13	19	ADEF		4	12	2|3			96		1A	1D	1336 TMR	TRUE	TRUE
4	26/05/2022 8:16	60	143	92			17	19	15	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 8:18	61	177	109			36	14	18	ADEF			12	3			10			1D	1336 TMR	TRUE	TRUE
4	26/05/2022 8:21	62	150	92			18	19	21	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 8:24	63	159	103			18	20	18	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 8:26	64	164	103			17	22	22	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 8:29	65	153	99			18	21	15	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 8:32	66	161	106			18	20	17	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 8:34	67	163	105			19	20	19	ADEF				None			11				1336 TMR	TRUE	TRUE
4	26/05/2022 8:37	68	167	102			36	14	15	ADEF			12	3			101			1D	1336 TMR	TRUE	TRUE
4	26/05/2022 8:40	69	153	95			19	19	20	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 8:42	70	158	103			17	22	16	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 8:45	71	144	104				24	16	AEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 8:47	72	174	120			18	19	17	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 8:50	73	162	106			19	19	18	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 8:53	74	160	104			18	20	18	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 8:56	75	159	104			19	19	17	ADEF				None							1336 TMR	TRUE	TRUE
4	26/05/2022 8:58	76	160	105			15	15	25	ADEF				None							1336 TMR	TRUE	TRUE

	Signal Phase Times					
AM Peak	A	B	C	D	E	F
Avg	102.8	#DIV/0!	#DIV/0!	19.6	19.1	18.0
Max	125.0	0.0	0.0	36.0	24.0	25.0
Min	16.0	0.0	0.0	15.0	13.0	15.0

PM Peak Signal Data

Intersectio	M1336/CTLR																							
Plan:	<Any>																							
Start:	Thursday	26 May 20	6:00:00																					
End:	Thursday	26 May 20	18:00:00																					
No of Cycle	325																							
No of Disca	0																							
4	26/05/2022 14:57	242	133	74			19	19	21	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 14:59	243	138	81			16	23	18	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:01	244	137	83			18	16	20	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:04	245	140	86			19	20	15	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:06	246	145	86			19	15	25	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:08	247	145	81			20	19	25	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:11	248	133	76			19	20	18	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:13	249	137	83			17	17	20	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:15	250	148	86			18	19	25	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:18	251	132	78			15	18	21	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:20	252	145	86			18	17	24	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:22	253	141	81			19	21	20	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:25	254	146	80			36	14	16	ADEF			11	3			21			1D	1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:27	255	136	74			15	25	22	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:29	256	138	78			20	19	21	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:32	257	146	80			36	14	16	ADEF			10	3			28			1D	1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:34	258	127	74			17	16	20	ADEF		5		2		34	29		1F		1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:36	259	153	87			36	14	16	ADEF		3	10	2|3			87		1A	1D	1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:39	260	122	74			15	16	17	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:41	261	158	92			36	14	16	ADEF			10	3			52			1D	1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:44	262	130	74			19	20	17	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:46	263	143	84			19	20	20	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:48	264	136	81			16	23	16	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:50	265	140	85			19	20	16	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:53	266	146	85			18	22	21	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:55	267	134	79			18	22	15	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 15:57	268	136	85			19	16	16	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:00	269	72	25			16	15	16	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:01	270	130	83			15	17	15	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:03	271	133	83			16	17	17	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:05	272	129	81			14	16	18	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:07	273	132	82			16	16	18	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:10	274	127	79			17	16	15	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:12	275	117	82				18	17	AEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:14	276	144	95			17	15	17	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:16	277	130	81			14	19	16	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:18	278	131	81			17	15	18	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:20	279	131	80			15	17	19	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:23	280	130	79			16	16	19	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:25	281	130	79			15	17	19	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:27	282	131	79			16	17	19	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:29	283	129	78			16	17	18	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:31	284	113	79			16		18	ADF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:33	285	147	96			15	18	18	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:36	286	128	79			15	18	16	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:38	287	144	81			36	13	14	ADEF			10	3		109	2			1D	1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:40	288	116	67			17	16	16	ADEF		9		2					1A		1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:42	289	132	81			15	17	19	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:44	290	130	79			16	16	19	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:46	291	130	79			16	16	19	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:49	292	130	79			16	16	19	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:51	293	131	79			18	16	18	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:53	294	129	79			17	14	19	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:55	295	131	79			14	18	20	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:57	296	129	78			16	16	19	ADEF				None							1336 Plan(	TRUE	TRUE	
4	26/05/2022 16:59	297	143	79			36	13	15	ADEF			10	3			66			1D	1336 Plan(	TRUE	TRUE	
4	26/05/2022 17:02	298	138	66		46		26		AEC				None							1336 Plan(	TRUE	TRUE	

	Signal Phase Times					
PM Peak	A	B	C	D	E	F
Avg	80.0	#DIV/0!	#DIV/0!	18.9	17.2	18.3
Max	96.0	0.0	0.0	36.0	25.0	25.0
Min	25.0	0.0	0.0	14.0	13.0	14.0

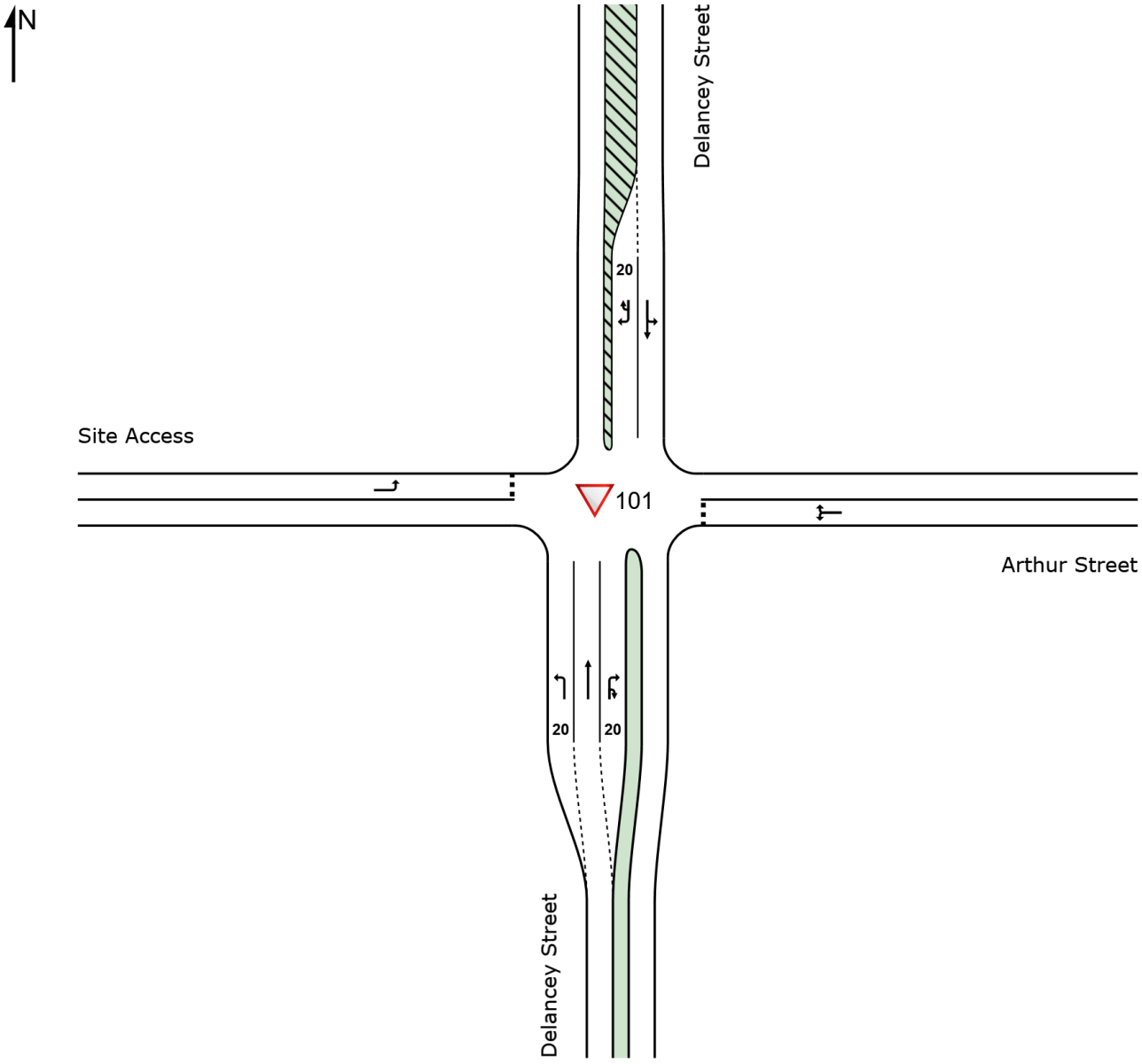
APPENDIX E- SIDRA OUTPUTS

SITE LAYOUT

Site: 101 [Delancey Street Site Access W/D 2024 AM (Site Folder: Access SIDRAS)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [Delancey Street Site Access W/D 2024 AM (Site Folder: Access SIDRAS)]

New Site
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: Delancey Street														
1	L2	79	0.0	83	0.0	0.045	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.6
2	T1	329	4.0	346	4.0	0.182	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	6	0.0	6	0.0	0.008	7.7	LOS A	0.0	0.2	0.54	0.65	0.54	51.0
3u	U	1	0.0	1	0.0	0.008	11.7	LOS B	0.0	0.2	0.54	0.65	0.54	51.1
Approach		415	3.2	437	3.2	0.182	1.2	NA	0.0	0.2	0.01	0.12	0.01	58.4
East: Arthur Street														
4	L2	7	0.0	7	0.0	0.024	8.6	LOS A	0.1	0.5	0.61	0.76	0.61	49.4
6	R2	3	0.0	3	0.0	0.024	18.0	LOS C	0.1	0.5	0.61	0.76	0.61	49.2
Approach		10	0.0	11	0.0	0.024	11.4	LOS B	0.1	0.5	0.61	0.76	0.61	49.3
North: Delancey Street														
7	L2	2	0.0	2	0.0	0.301	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	58.2
8	T1	545	2.0	574	2.0	0.301	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
9	R2	95	0.0	100	0.0	0.111	7.6	LOS A	0.4	3.1	0.48	0.70	0.48	51.5
9u	U	1	0.0	1	0.0	0.111	9.3	LOS A	0.4	3.1	0.48	0.70	0.48	51.6
Approach		643	1.7	677	1.7	0.301	1.2	NA	0.4	3.1	0.07	0.11	0.07	58.4
West: Site Access														
10	L2	126	0.0	133	0.0	0.143	7.3	LOS A	0.5	3.7	0.42	0.67	0.42	52.3
Approach		126	0.0	133	0.0	0.143	7.3	LOS A	0.5	3.7	0.42	0.67	0.42	52.3
All Vehicles		1194	2.0	1257	2.0	0.301	2.0	NA	0.5	3.7	0.09	0.18	0.09	57.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Delancey Street Site Access W/D 2024 PM (Site Folder: Access SIDRAS)]

New Site
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: Delancey Street														
1	L2	59	4.0	62	4.0	0.034	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.4
2	T1	322	0.0	339	0.0	0.174	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	9	0.0	9	0.0	0.010	6.9	LOS A	0.0	0.3	0.46	0.61	0.46	51.8
3u	U	1	0.0	1	0.0	0.010	9.8	LOS A	0.0	0.3	0.46	0.61	0.46	51.9
Approach		391	0.6	412	0.6	0.174	1.1	NA	0.0	0.3	0.01	0.10	0.01	58.6
East: Arthur Street														
4	L2	6	0.0	6	0.0	0.014	7.5	LOS A	0.0	0.3	0.50	0.67	0.50	50.9
6	R2	2	0.0	2	0.0	0.014	14.6	LOS B	0.0	0.3	0.50	0.67	0.50	50.6
Approach		8	0.0	8	0.0	0.014	9.3	LOS A	0.0	0.3	0.50	0.67	0.50	50.8
North: Delancey Street														
7	L2	3	1.0	3	1.0	0.225	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	58.2
8	T1	408	1.0	429	1.0	0.225	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
9	R2	69	0.0	73	0.0	0.078	7.3	LOS A	0.3	2.1	0.45	0.67	0.45	51.7
9u	U	1	0.0	1	0.0	0.078	9.1	LOS A	0.3	2.1	0.45	0.67	0.45	51.8
Approach		481	0.9	506	0.9	0.225	1.2	NA	0.3	2.1	0.07	0.10	0.07	58.5
West: Site Access														
10	L2	176	2.0	185	2.0	0.199	7.4	LOS A	0.8	5.5	0.43	0.68	0.43	52.2
Approach		176	2.0	185	2.0	0.199	7.4	LOS A	0.8	5.5	0.43	0.68	0.43	52.2
All Vehicles		1056	0.9	1112	0.9	0.225	2.2	NA	0.8	5.5	0.11	0.20	0.11	57.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Delancey Street Site Access W/D 2034 AM (Site Folder: Access SIDRAS)]

New Site
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: Delancey Street														
1	L2	79	0.0	83	0.0	0.045	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.6
2	T1	440	4.0	463	4.0	0.244	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	7	0.0	7	0.0	0.011	8.2	LOS A	0.0	0.3	0.57	0.68	0.57	50.7
3u	U	1	0.0	1	0.0	0.011	12.7	LOS B	0.0	0.3	0.57	0.68	0.57	50.8
Approach		527	3.3	555	3.3	0.244	1.0	NA	0.0	0.3	0.01	0.10	0.01	58.7
East: Arthur Street														
4	L2	8	0.0	8	0.0	0.037	9.2	LOS A	0.1	0.8	0.69	0.82	0.69	47.7
6	R2	4	0.0	4	0.0	0.037	23.6	LOS C	0.1	0.8	0.69	0.82	0.69	47.5
Approach		12	0.0	13	0.0	0.037	14.0	LOS B	0.1	0.8	0.69	0.82	0.69	47.6
North: Delancey Street														
7	L2	3	0.0	3	0.0	0.335	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	58.2
8	T1	605	2.0	637	2.0	0.335	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
9	R2	95	0.0	100	0.0	0.129	8.5	LOS A	0.5	3.5	0.54	0.77	0.54	50.9
9u	U	1	0.0	1	0.0	0.129	10.7	LOS B	0.5	3.5	0.54	0.77	0.54	50.9
Approach		704	1.7	741	1.7	0.335	1.3	NA	0.5	3.5	0.07	0.11	0.07	58.4
West: Site Access														
10	L2	126	0.0	133	0.0	0.166	8.2	LOS A	0.6	4.2	0.49	0.74	0.49	51.6
Approach		126	0.0	133	0.0	0.166	8.2	LOS A	0.6	4.2	0.49	0.74	0.49	51.6
All Vehicles		1369	2.2	1441	2.2	0.335	1.9	NA	0.6	4.2	0.09	0.17	0.09	57.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Delancey Street Site Access W/D 2034 PM (Site Folder: Access SIDRAS)]

New Site
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: Delancey Street														
1	L2	59	4.0	62	4.0	0.034	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.4
2	T1	359	0.0	378	0.0	0.194	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	10	0.0	11	0.0	0.011	7.1	LOS A	0.0	0.3	0.48	0.62	0.48	51.7
3u	U	1	0.0	1	0.0	0.011	10.2	LOS B	0.0	0.3	0.48	0.62	0.48	51.7
Approach		429	0.6	452	0.6	0.194	1.0	NA	0.0	0.3	0.01	0.10	0.01	58.7
East: Arthur Street														
4	L2	7	0.0	7	0.0	0.017	7.7	LOS A	0.1	0.4	0.52	0.68	0.52	50.6
6	R2	2	0.0	2	0.0	0.017	16.2	LOS C	0.1	0.4	0.52	0.68	0.52	50.4
Approach		9	0.0	9	0.0	0.017	9.6	LOS A	0.1	0.4	0.52	0.68	0.52	50.6
North: Delancey Street														
7	L2	4	1.0	4	1.0	0.245	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	58.2
8	T1	444	1.0	467	1.0	0.245	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
9	R2	69	0.0	73	0.0	0.082	7.6	LOS A	0.3	2.2	0.47	0.69	0.47	51.5
9u	U	1	0.0	1	0.0	0.082	9.5	LOS A	0.3	2.2	0.47	0.69	0.47	51.6
Approach		518	0.9	545	0.9	0.245	1.1	NA	0.3	2.2	0.06	0.10	0.06	58.5
West: Site Access														
10	L2	176	2.0	185	2.0	0.208	7.6	LOS A	0.8	5.7	0.46	0.71	0.46	52.0
Approach		176	2.0	185	2.0	0.208	7.6	LOS A	0.8	5.7	0.46	0.71	0.46	52.0
All Vehicles		1132	0.9	1192	0.9	0.245	2.2	NA	0.8	5.7	0.11	0.20	0.11	57.4

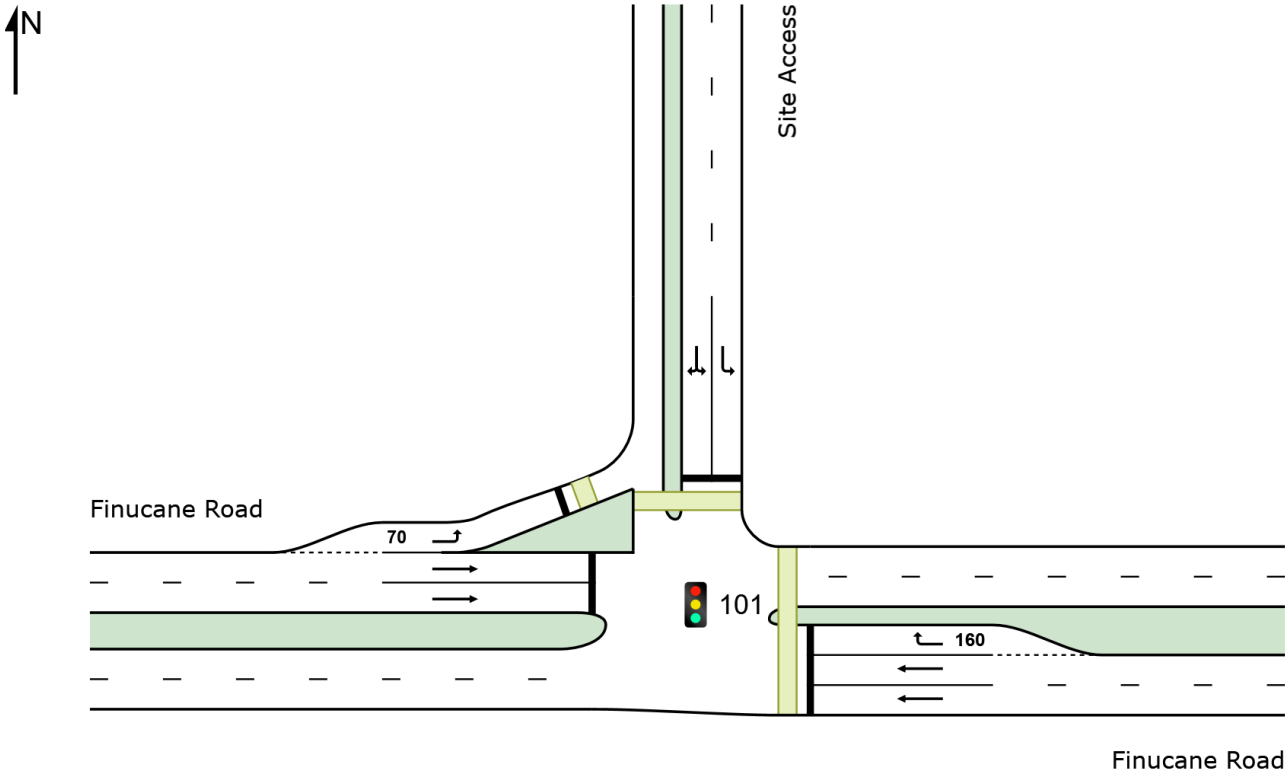
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [Finucane Road Site Access W/D 2024 AM (Site Folder: Access SIDRAS)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [Finucane Road Site Access W/D 2024 AM (Site Folder: Access SIDRAS)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)

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
East: Finucane Road														
5	T1	1548	2.0	1629	2.0	0.595	6.9	LOS A	17.7	126.0	0.54	0.50	0.54	53.9
6	R2	142	0.0	149	0.0	* 0.604	47.1	LOS D	6.5	45.4	0.99	0.81	1.01	33.3
Approach		1690	1.8	1779	1.8	0.604	10.3	LOS B	17.7	126.0	0.58	0.52	0.58	51.2
North: Site Access														
7	L2	133	0.0	140	0.0	0.212	27.3	LOS C	4.3	30.0	0.74	0.75	0.74	40.7
9	R2	142	0.0	149	0.0	* 0.517	44.5	LOS D	6.2	43.7	0.97	0.80	0.97	34.2
Approach		275	0.0	289	0.0	0.517	36.2	LOS D	6.2	43.7	0.85	0.78	0.85	37.0
West: Finucane Road														
10	L2	230	0.0	242	0.0	0.178	9.5	LOS A	3.2	22.4	0.33	0.65	0.33	51.4
11	T1	1124	4.0	1183	4.0	* 0.620	16.7	LOS B	18.9	136.5	0.76	0.68	0.76	47.0
Approach		1354	3.3	1425	3.3	0.620	15.5	LOS B	18.9	136.5	0.69	0.68	0.69	47.7
All Vehicles		3319	2.3	3494	2.3	0.620	14.6	LOS B	18.9	136.5	0.65	0.61	0.65	48.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Finucane Road												
P2	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	208.9	220.5	1.06
North: Site Access												
P3	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	203.8	213.9	1.05
West: Finucane Road												
P4B	Slip/ Bypass	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	196.4	204.3	1.04
All Pedestrians		150	158	39.3	LOS D	0.1	0.1	0.94	0.94	203.1	212.9	1.05

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: 101 [Finucane Road Site Access W/D 2024 AM (Site Folder: Access SIDRAS)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)

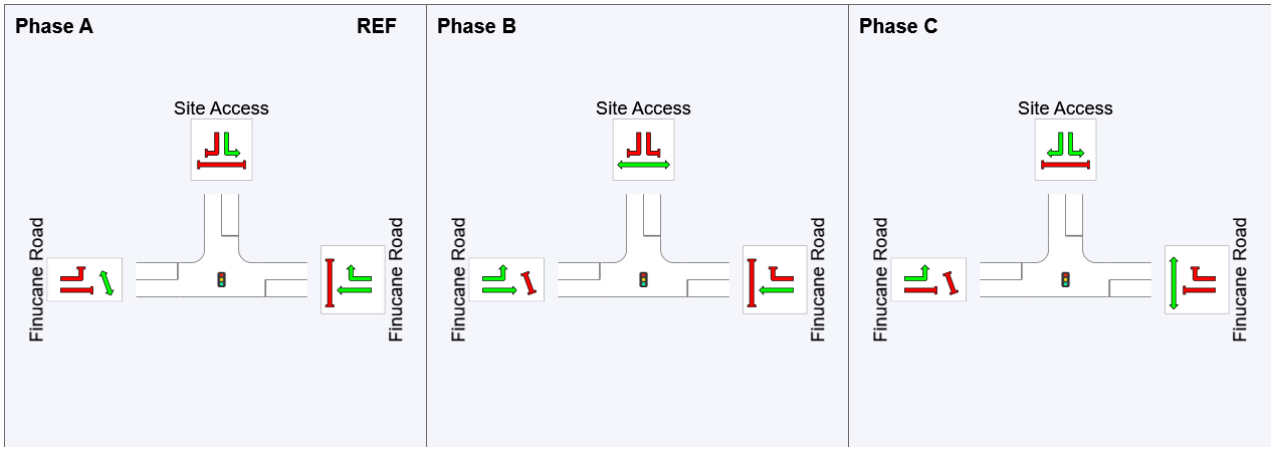
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

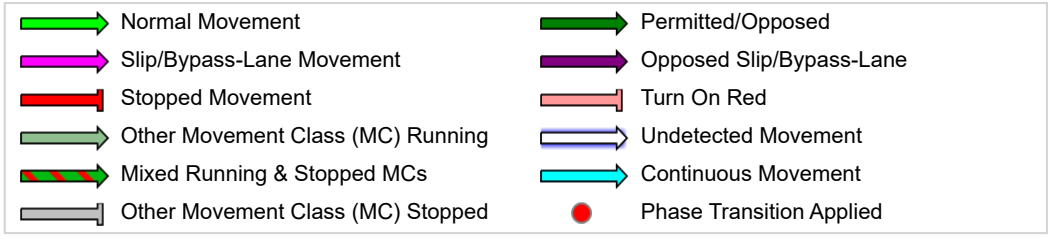
Phase	A	B	C
Phase Change Time (sec)	0	18	70
Green Time (sec)	12	46	14
Phase Time (sec)	18	52	20
Phase Split	20%	58%	22%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



MOVEMENT SUMMARY

Site: 101 [Finucane Road Site Access W/D 2024 PM (Site Folder: Access SIDRAS)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)

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
East: Finucane Road														
5	T1	1441	2.0	1517	2.0	0.601	9.4	LOS A	18.7	133.3	0.62	0.56	0.62	52.0
6	R2	124	0.0	131	0.0	* 0.633	49.4	LOS D	5.8	40.9	1.00	0.82	1.06	32.6
Approach		1565	1.8	1647	1.8	0.633	12.6	LOS B	18.7	133.3	0.65	0.58	0.65	49.6
North: Site Access														
7	L2	171	0.0	180	0.0	0.249	25.5	LOS C	5.3	37.4	0.72	0.76	0.72	41.5
9	R2	228	0.0	240	0.0	* 0.612	41.1	LOS D	9.8	68.6	0.96	0.82	0.96	35.3
Approach		399	0.0	420	0.0	0.612	34.4	LOS C	9.8	68.6	0.85	0.79	0.85	37.7
West: Finucane Road														
10	L2	190	0.0	200	0.0	0.143	8.8	LOS A	2.4	16.5	0.29	0.64	0.29	51.9
11	T1	1083	1.0	1140	1.0	* 0.623	18.7	LOS B	18.8	132.6	0.80	0.71	0.80	45.9
Approach		1273	0.9	1340	0.9	0.623	17.2	LOS B	18.8	132.6	0.72	0.70	0.72	46.7
All Vehicles		3237	1.2	3407	1.2	0.633	17.1	LOS B	18.8	133.3	0.70	0.65	0.70	46.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Finucane Road												
P2	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	208.9	220.5	1.06
North: Site Access												
P3	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	203.8	213.9	1.05
West: Finucane Road												
P4B	Slip/ Bypass	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	196.4	204.3	1.04
All Pedestrians		150	158	39.3	LOS D	0.1	0.1	0.94	0.94	203.1	212.9	1.05

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: 101 [Finucane Road Site Access W/D 2024 PM (Site Folder: Access SIDRAS)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)

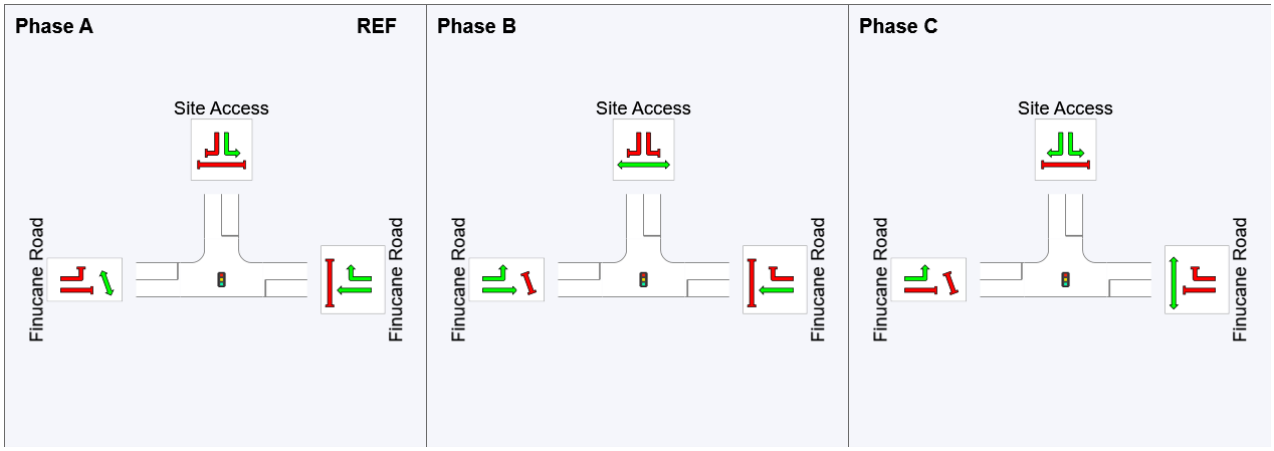
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

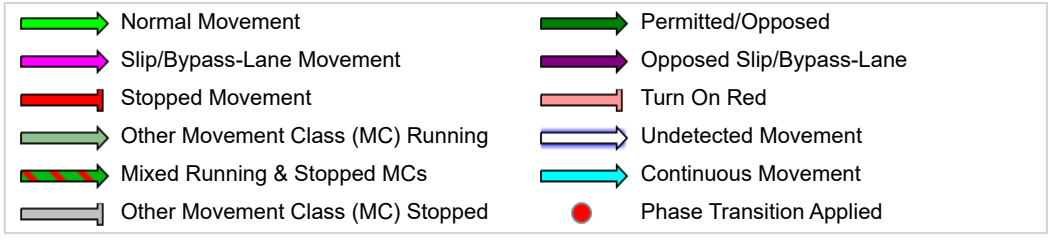
Phase	A	B	C
Phase Change Time (sec)	0	16	65
Green Time (sec)	10	43	19
Phase Time (sec)	16	49	25
Phase Split	18%	54%	28%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



MOVEMENT SUMMARY

Site: 101 [Finucane Road Site Access W/D 2034 AM (Site Folder: Access SIDRAS)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)

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
East: Finucane Road														
5	T1	1656	2.0	1743	2.0	0.637	7.3	LOS A	20.0	142.1	0.57	0.53	0.57	53.6
6	R2	142	0.0	149	0.0	* 0.659	48.9	LOS D	6.7	46.7	1.00	0.83	1.07	32.8
Approach		1798	1.8	1893	1.8	0.659	10.6	LOS B	20.0	142.1	0.61	0.55	0.61	51.0
North: Site Access														
7	L2	133	0.0	140	0.0	0.219	28.1	LOS C	4.4	30.5	0.75	0.75	0.75	40.3
9	R2	184	0.0	194	0.0	* 0.670	46.4	LOS D	8.5	59.2	0.99	0.84	1.05	33.6
Approach		317	0.0	334	0.0	0.670	38.7	LOS D	8.5	59.2	0.89	0.80	0.93	36.1
West: Finucane Road														
10	L2	230	0.0	242	0.0	0.175	9.2	LOS A	3.1	21.4	0.31	0.65	0.31	51.6
11	T1	1287	4.0	1355	4.0	* 0.713	17.1	LOS B	23.6	170.8	0.80	0.72	0.80	46.8
Approach		1517	3.4	1597	3.4	0.713	15.9	LOS B	23.6	170.8	0.73	0.71	0.73	47.5
All Vehicles		3632	2.3	3823	2.3	0.713	15.3	LOS B	23.6	170.8	0.68	0.64	0.69	47.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Finucane Road												
P2	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	208.9	220.5	1.06
North: Site Access												
P3	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	203.8	213.9	1.05
West: Finucane Road												
P4B	Slip/ Bypass	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	196.4	204.3	1.04
All Pedestrians		150	158	39.3	LOS D	0.1	0.1	0.94	0.94	203.1	212.9	1.05

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: 101 [Finucane Road Site Access W/D 2034 AM (Site Folder: Access SIDRAS)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)

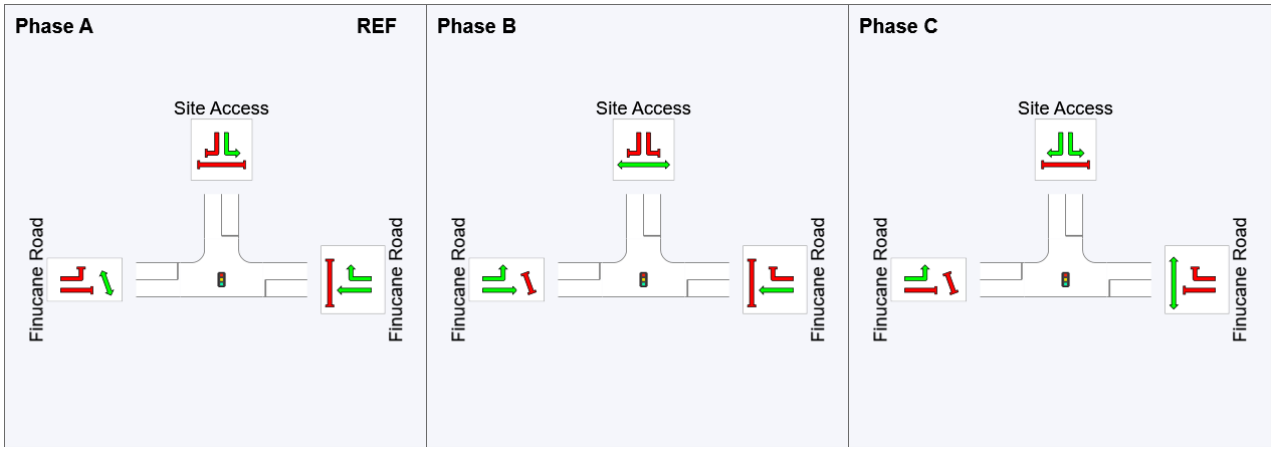
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

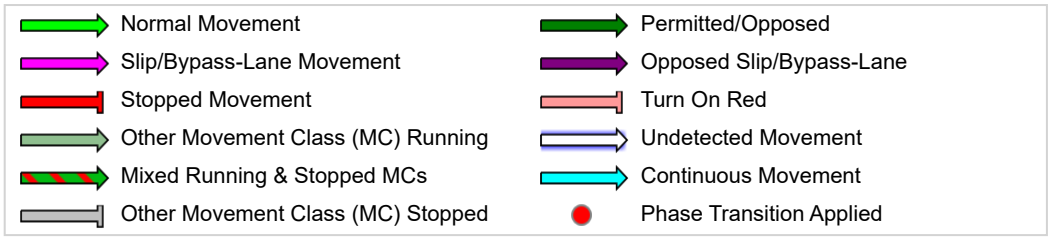
Phase	A	B	C
Phase Change Time (sec)	0	17	70
Green Time (sec)	11	47	14
Phase Time (sec)	17	53	20
Phase Split	19%	59%	22%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



MOVEMENT SUMMARY

Site: 101 [Finucane Road Site Access W/D 2034 PM (Site Folder: Access SIDRAS)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)

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
East: Finucane Road														
5	T1	1589	2.0	1673	2.0	0.641	8.8	LOS A	20.7	147.3	0.62	0.57	0.62	52.4
6	R2	124	0.0	131	0.0	* 0.633	49.4	LOS D	5.8	40.9	1.00	0.82	1.06	32.6
Approach		1713	1.9	1803	1.9	0.641	11.7	LOS B	20.7	147.3	0.65	0.59	0.65	50.2
North: Site Access														
7	L2	171	0.0	180	0.0	0.264	27.1	LOS C	5.5	38.8	0.74	0.76	0.74	40.8
9	R2	228	0.0	240	0.0	* 0.684	44.1	LOS D	10.3	72.1	0.99	0.85	1.04	34.3
Approach		399	0.0	420	0.0	0.684	36.8	LOS D	10.3	72.1	0.88	0.81	0.91	36.8
West: Finucane Road														
10	L2	190	0.0	200	0.0	0.143	8.8	LOS A	2.4	16.5	0.29	0.64	0.29	51.9
11	T1	1239	1.0	1304	1.0	* 0.695	18.2	LOS B	22.6	159.6	0.81	0.73	0.81	46.2
Approach		1429	0.9	1504	0.9	0.695	17.0	LOS B	22.6	159.6	0.74	0.72	0.74	46.9
All Vehicles		3541	1.2	3727	1.2	0.695	16.7	LOS B	22.6	159.6	0.71	0.66	0.72	46.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Finucane Road												
P2	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	208.9	220.5	1.06
North: Site Access												
P3	Full	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	203.8	213.9	1.05
West: Finucane Road												
P4B	Slip/ Bypass	50	53	39.3	LOS D	0.1	0.1	0.94	0.94	196.4	204.3	1.04
All Pedestrians		150	158	39.3	LOS D	0.1	0.1	0.94	0.94	203.1	212.9	1.05

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: 101 [Finucane Road Site Access W/D 2034 PM (Site Folder: Access SIDRAS)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site User-Given Cycle Time)

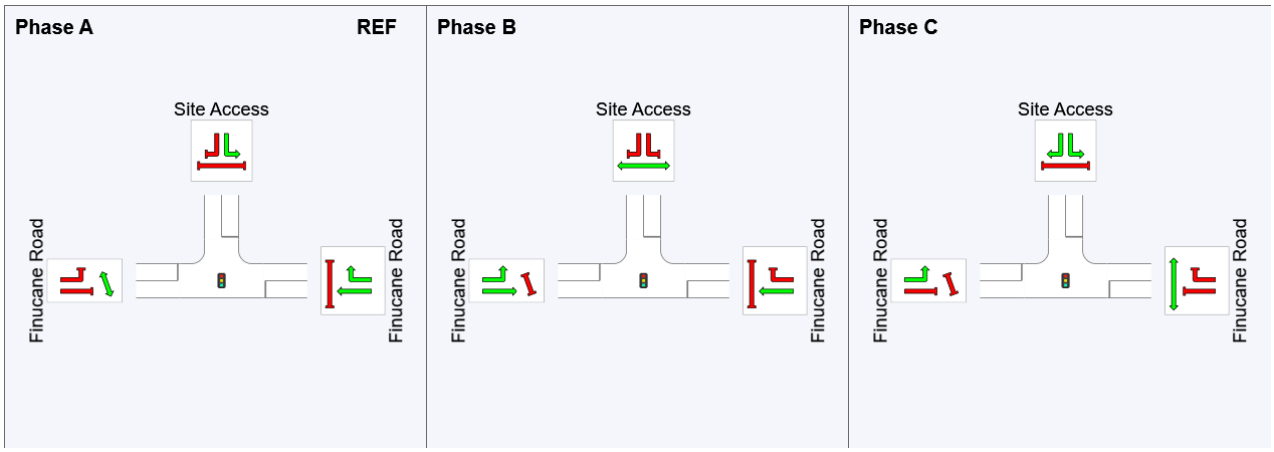
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Leading Right Turn
Reference Phase: Phase A
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C

Phase Timing Summary

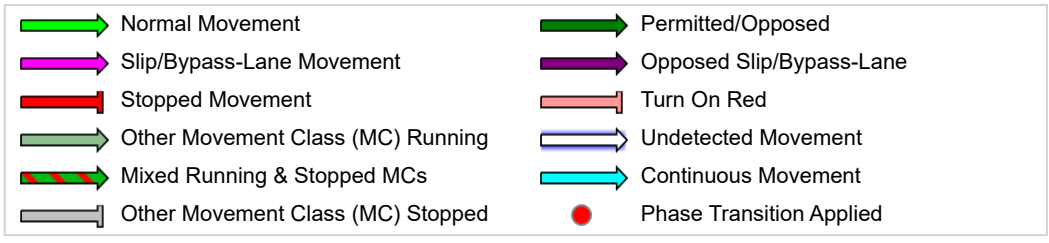
Phase	A	B	C
Phase Change Time (sec)	0	16	67
Green Time (sec)	10	45	17
Phase Time (sec)	16	51	23
Phase Split	18%	57%	26%

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

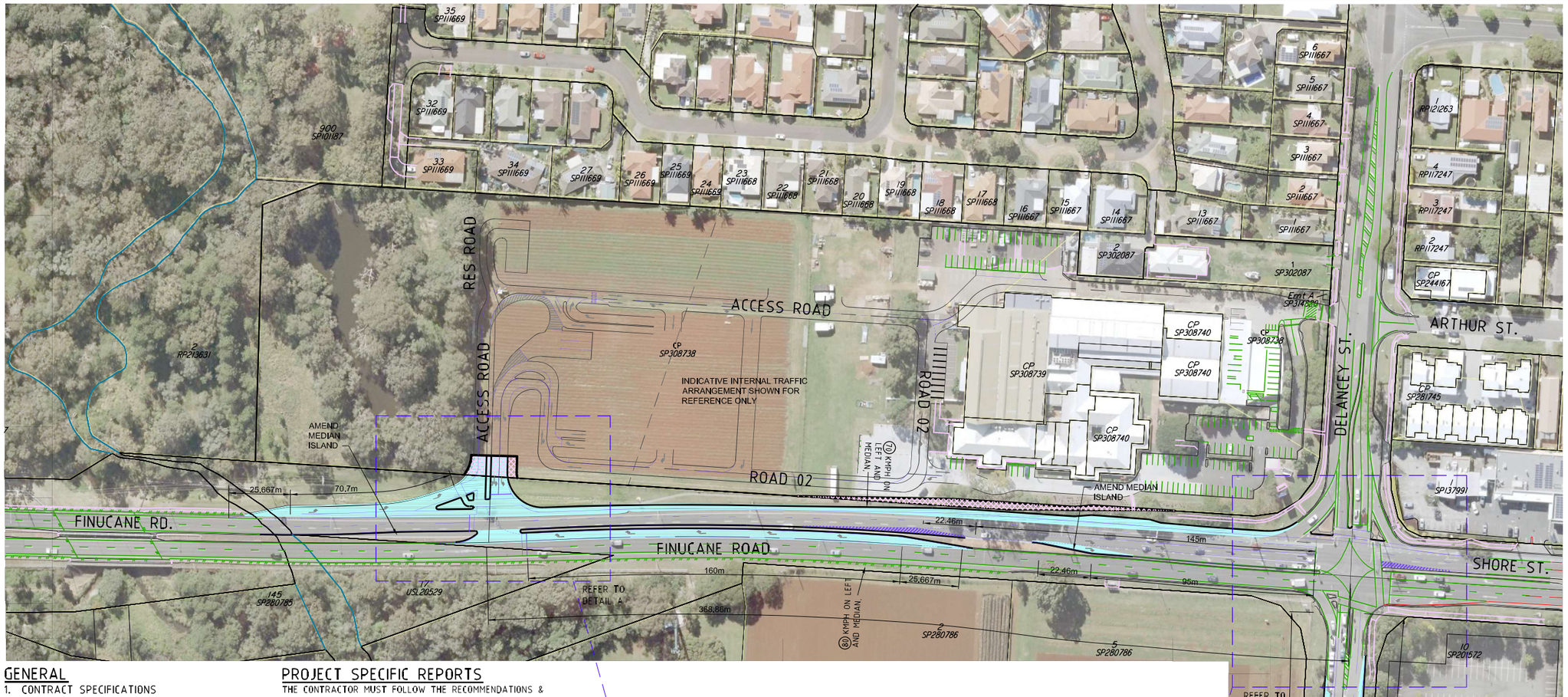
Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



APPENDIX F- CONCEPT INTERSECTION DESIGNS



GENERAL

1. CONTRACT SPECIFICATIONS
   ALL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE CONTRACT SPECIFICATION.
2. SETOUT
   SURVEY SETOUT INFORMATION HAS BEEN ESTABLISHED ON SITE BY THE PRINCIPAL'S SURVEYOR TO ENABLE THE CONTRACTOR TO ACCURATELY SETOUT THE WORKS TO THE CO-ORDINATES SHOWN. SETOUT INFORMATION SHALL NOT BE OBTAINED BY SCALING FROM THESE DRAWINGS.
3. DATUM
   LEVELS SHOWN ARE TO A.H.D.
4. TRENCH SPOIL
   ALL MATERIALS ARISING FROM ROADS & SERVICES ARE TO BE COMPACTED TO FUTURE STAGES, TO LEVEL 1 IF NO SPOIL AREA IS AVAILABLE THESE MATERIALS SHALL BE TRUCKED TO A LICENSED TIP. THESE WORKS FORM PART OF THE CONTRACTED WORKS.
5. CHECK ELECTRONIC SETOUT
   CONTRACTOR IS RESPONSIBLE TO ENSURE ANY ELECTRONIC DATA FILES MATCH THE DRAWINGS.
6. PRE START
   a. ERECT SITE SIGNAGE. CONSTRUCT ENTRY & EXIT POINT AS INDICATED.
   b. CONSTRUCT VEHICLE WASHDOWN AREA & ASSOCIATED SILT MANAGEMENT DEVICES.
   c. CONSTRUCT SITE OFFICE & STORAGE COMPOUND AREA.
   d. INSTALL EROSION & SEDIMENT CONTROL DEVICES AS PER THE CONTRACTOR'S EROSION & SEDIMENT CONTROL PLAN.
   e. ERECT TEMPORARY TREE PROTECTION FENCING IN ACCORDANCE WITH THE APPROVED VEGETATION MANAGEMENT PLAN & AUTHORITIES APPROVAL CONDITIONS (IF REQUIRED).
7. HEALTH & SAFETY
   ALL WORKS UNDERTAKEN BY THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE WORKPLACE HEALTH & SAFETY LEGISLATION.
8. STOCKPILING
   STOCKPILING OF ANY SURPLUS MATERIAL IS NOT PERMITTED

EXTENT OF ROAD WIDENING CONSTRUCTION & EXISTING PAVEMENT RECONSTRUCTION WORKS TO BE DETERMINED AS PART OF OPERATIONAL WORKS APPLICATION.

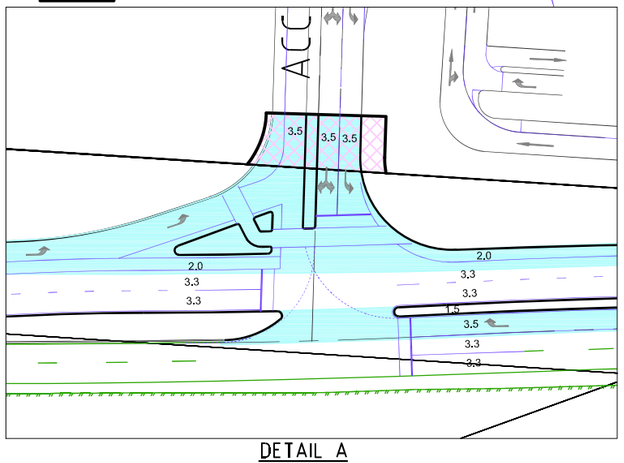
PROJECT SPECIFIC REPORTS

THE CONTRACTOR MUST FOLLOW THE RECOMMENDATIONS & PROCEDURES OUTLINED IN THE FOLLOWING REPORTS AT ALL TIMES:
a) GEOTECHNICAL INVESTIGATION REPORTS (INCLUDING ANY ACID SULPHATE OR DISPERSIVE SOIL REPORTING)
b) VEGETATION & FAUNA MANAGEMENT PLANS
c) OTHER MANAGEMENT PLANS NOMINATED IN THE CONTRACT, AUTHORITIES APPROVAL CONDITIONS OR BY THE SUPERINTENDENT.

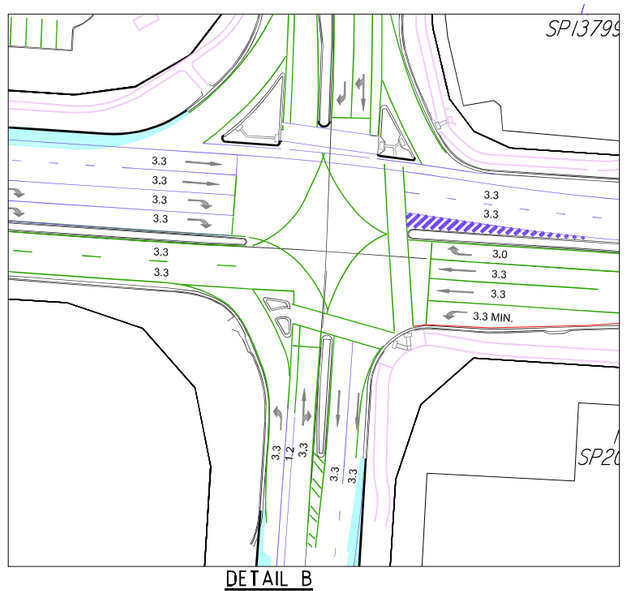
LEGEND

- EXISTING PROPERTY LINE
- EXISTING KERB (INVERT)
- FUTURE PROPERTY LINE
- FUTURE KERB (INVERT)
- PROPOSED PROPERTY LINE
- PROPOSED KERB (INVERT)
- PROPOSED ROAD WORKS
- PROPOSED RESUMPTION AREA

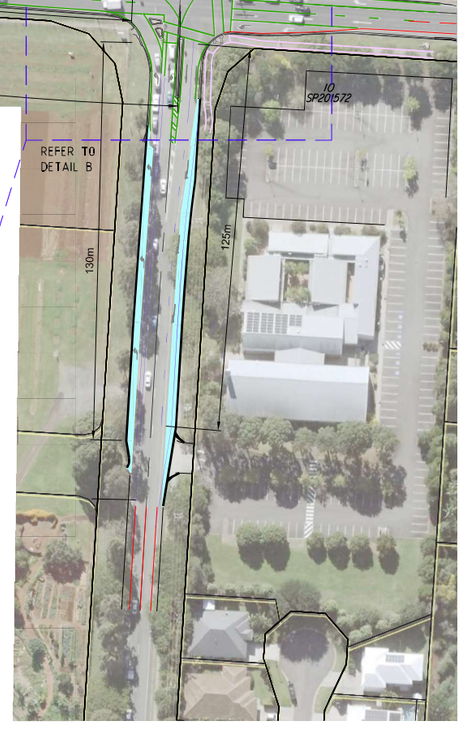
RESUMPTION AREA	
LOT	AREA
CP 308738	443.4m²
ACCESS RESTRICTION STRIP	18.2m²



DETAIL A



DETAIL B



DIAL BEFORE YOU DIG www.1100.com.au

PROJECT NAME

hub 68 CENTRE OF EXCELLENCE AGEING & WELLNESS

EXTERNAL WORKS PRELIMINARY

RP DESCRIPTION
LOT 0 SP308738, LOTS 0-2 SP308739,
LOT 0 SP308740, LOT 4 SP308740,
LOTS 10-16 SP314782
58-68 DELANCEY STREET
LOCALITY OF ORMISTON

CLIENT

THE HUB PRECINCT PTY LTD

NORTH

0 10 20 30 40 50m
Scale 1:1000 - A1 (1:2000 - A3)

ISSUES	DATE	
TENDER		
COUNCIL	. . .	
CONSTRUCTION	..	

PRE	DATE	AMENDMENT
B	11.04.23	ADJUST INERNAL REFERENCE WORKS
A	22.11.22	COUNCIL ISSUE

ASSOCIATED CONSULTANTS

DESTRAVIS GROUP
LAMBERT & REHBEIN ENGINEERS • MANAGERS • SCIENTISTS
BIOME WATER AND ENVIRONMENTAL CONSULTING

DRAWING TITLE

EXTERNAL FUNCTIONAL LAYOUT PLAN & GENERAL NOTES

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Project Coordination
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DESIGNED	RCB	DRAWN	RCB
APPROVED		RPEQ	DATE 22.11.22

DRAWING NUMBER 37801-XWP-005
AMEND. B