

Dear Mark,

20 September 2018

Mark Pisani
Traffic Engineer
City of Yarra

**Proposed Mixed Use Development
622-642 Nicholson Street, Fitzroy North**

1 Introduction

Ratio Consultants has reviewed the traffic referral comments received from the City of Yarra, dated 15 August 2018, in response to the application for a mixed-use development on the site located at 622-642 Nicholson Street, Fitzroy North. The referral comments are generally supportive of the proposal, however require additional information assessing the impact of the development traffic on the operation of Nicholson Street. More specifically, the referral comments state the following:

The submitted report does not provide information on the impact the development traffic would have on the operation of Nicholson Street. Can the development traffic be absorbed by Nicholson Street during the AM and PM peak hours? Further information on this matter should be forwarded to Council.

To assess the impact of the development traffic on the operation of Nicholson Street, a SIDRA analysis has been undertaken at the proposed vehicle access point on Nicholson Street for the AM and PM peak hours. The assessment is outlined in detail within this letter.

2 The Proposal

The proposed development schedule has remained unchanged following lodgement with Council, with the exception of a slight reduction in the overall car parking provision proposed and decrease in the number of practitioners within the medical centre from 10 to nine. The changes to the proposal are summarised in Table 2.1 below:

Table 2.1: The Proposal

Land Use	Original Application Plans	'Without Prejudice' Plans
Supermarket	1,390sqm	1,390sqm
Bottle Shop	120sqm	120sqm
Medical Centre	10 practitioners and a floor area of 1,710sqm	9 practitioners and a floor area of 1,710sqm
Office Use	8,471sqm	8,471sqm
No of Car Parking Spaces	157	151
No of Bicycle Parking Spaces	125	125

As can be seen in Table 2.1, the number of car parking spaces has been decreased from 157 spaces to 151 spaces within the 'Without Prejudice' plans. The revised allocation of car parking is shown in Table 2.2 below.

Table 2.2: Parking Allocation

Land Use	Original Application Plans	'Without Prejudice' Plans
Supermarket & Bottle Shop	46	42
Medical Centre	23	23
Office Use	88	86
Total	157	151

3 Existing Traffic Volumes

Southbound traffic volumes along Nicholson Street fronting the subject site have been determined by extracting VicRoads SCATs data at the intersection of Nicholson Street / Reid Street / Richardson Street. Southbound traffic volumes along Nicholson Street on Thursday 23 & 30 August 2018 are shown in Table 3.1:

Table 3.1: Existing Southbound Traffic along Nicholson Street

Date	AM PEAK HOUR	PM PEAK HOUR	COMBINED
Thursday 23 August 2018	903 vph	807 vph	1,710 vph
Thursday 30 August 2018	887 vph	821 vph	1,708 vph

For the purposes of this assessment, the date with the highest level of traffic recorded along Nicholson Street has been adopted to represent existing volumes. As shown in Table 3.1, this level of traffic occurred on Thursday 23 August 2018.

4 Traffic Generation

Traffic generation rates adopted for the different land uses within this assessment are generally consistent with the rates outlined within the Traffic Impact Assessment Report (TIAR) submitted by Ratio Consultants (14843REP02), with the exception of the rate for the supermarket component of the development. The rates adopted are discussed in more detail below.

Supermarket Traffic

The traffic generation rate adopted for the supermarket component of the development within the application TIAR was estimated based on existing standalone supermarkets within metropolitan Melbourne at a rate of 11.0 vehicles per 100sqm of floor area during the critical PM peak hour.

Since lodging the TIAR with Council, Ratio Consultants has conducted a case study at a similar supermarket located at 808 Sydney Road, Brunswick. The case study site at Sydney Road is considered to be very similar to the proposed supermarket component of the development on the basis of the following:

- Both sites are located within close proximity to the Melbourne CBD (noting that the subject site is closer);
- Both sites have a high level of accessibility to public transport and the surrounding bicycle network;

- The supermarkets comprise a similar floor area;
- Both sites are located within mixed-use developments with a proportion of the trade anticipated to be generated by multi-purpose trips associated with other users of the development, decreasing the peak traffic generation rate;
- Both supermarkets will primarily service the local residential catchment area. Accordingly, it is anticipated that a significant proportion of the supermarket trade will access both sites by walking, cycling or using public transport; and
- The provision of car parking for both sites is very similar (approximately 3.0 spaces per 100sqm of floor area).

The case study data indicates that the supermarket component of the development could generate traffic at a maximum rate of 5.0 vehicle movements per 100sqm of floor area during the PM peak period, which is significantly lower than the rate adopted within the TIAR (11.0 vehicles per 100sqm of floor area).

Accordingly, the traffic generation of the supermarket component of the development has been updated on the basis of the more reflective rate of 5.0 vehicle movements per 100sqm of floor area.

Outside the critical PM peak hour period the traffic generation rate will decline. It is considered that only 50% of PM peak hour rate will occur during the AM peak period, with a 50:50 split between arrivals and departures in the PM peak, and 75% arrivals and 25% departures during the AM peak period.

A summary of the anticipated traffic generation of the supermarket is provided in Table 4.1 below.

Table 4.1: Supermarket Traffic Generation

	AM Peak	PM Peak
Arriving trips:	23 vph	35 vph
Departing trips:	12 vph	35 vph
Total	35 vph	70 vph

Bottle Shop Traffic

The bottle shop is expected to generate in the order of seven trips per 100sqm per peak hour for staff and customer trips and in the order of 30 trips per 100sqm per day. On this basis, it is estimated that for the PM commuter peak hour the 120 sqm leasable floor area of shop use will generate in the order of eight trips per hour and in the order of 36 trips per day.

During the morning commuter peak period, the traffic associated with the shop activities will be reduced. On the basis of an hourly traffic generation rate of seven vehicles per hour per 100 square metres during the PM peak period and 50% of this rate during the AM peak period, with a 50:50 split between arrivals and departures in the PM peak, and 75% arrivals and 25% departures during the AM peak period, the traffic generation is as shown in Table 4.2.

Table 4.2: Bottle Shop Traffic Generation

	AM Peak	PM Peak
Arriving trips:	3 vph	4 vph
Departing trips:	1 vph	4 vph
Total trips:	4 vph	8 vph

Office

Based on surveys at other office developments in Melbourne, it is expected that the office component of the development will generate 0.5 vehicular trips per car space during the morning peak hour and 0.5 vehicular trips per car space during the afternoon peak hour. A total of 86 car parking spaces are allocated for employees of the office component of the development.

Employee trips will be mainly arriving in the morning peak and departing in the afternoon peak with approximately 90% of employees assumed to arrive in the morning and depart in the evening peak.

The office traffic generation for the AM and PM peak hours is shown below:

Table 4.3: Office Traffic Generation

	Morning Peak Hour	Evening Peak Hour
Arriving trips:	39 vph	4 vph
Departing trips:	4 vph	39 vph
Total trips:	43 vph	43 vph

Medical Centre Traffic

Traffic movements associated with the medical centre during peak times will be related to patients arriving and departing. Assuming that each practitioner consults one patient every 30 minutes on average, results in a traffic generation of four vehicle movements per practitioner during peak times. The number of practitioners within the medical centre is nine.

Applying this rate to the proposed medical centre produces a peak hour trip demand of 36 trips per hour, generally split evenly between inbound. This is considered to be a conservative estimation of the traffic generation of the medical centre component of the development given the suppression of parking for the medical centre.

The traffic generation for the medical centre is shown in Table 4.4.

Table 4.4: Medical Centre Traffic Generation

	AM Peak	PM Peak
Arriving trips:	18 vph	18 vph
Departing trips:	18 vph	18 vph
Total trips:	36 vph	36 vph

Overall Traffic Generation

A summary of the peak hour traffic generation for the proposed development is presented in Table 4.5.

Table 4.5 - Overall Traffic Generation

Use	AM Peak	PM Peak
Arriving trips:	83 vph	61 vph
Departing trips:	35 vph	96 vph
Total trips:	118 vph	157 vph

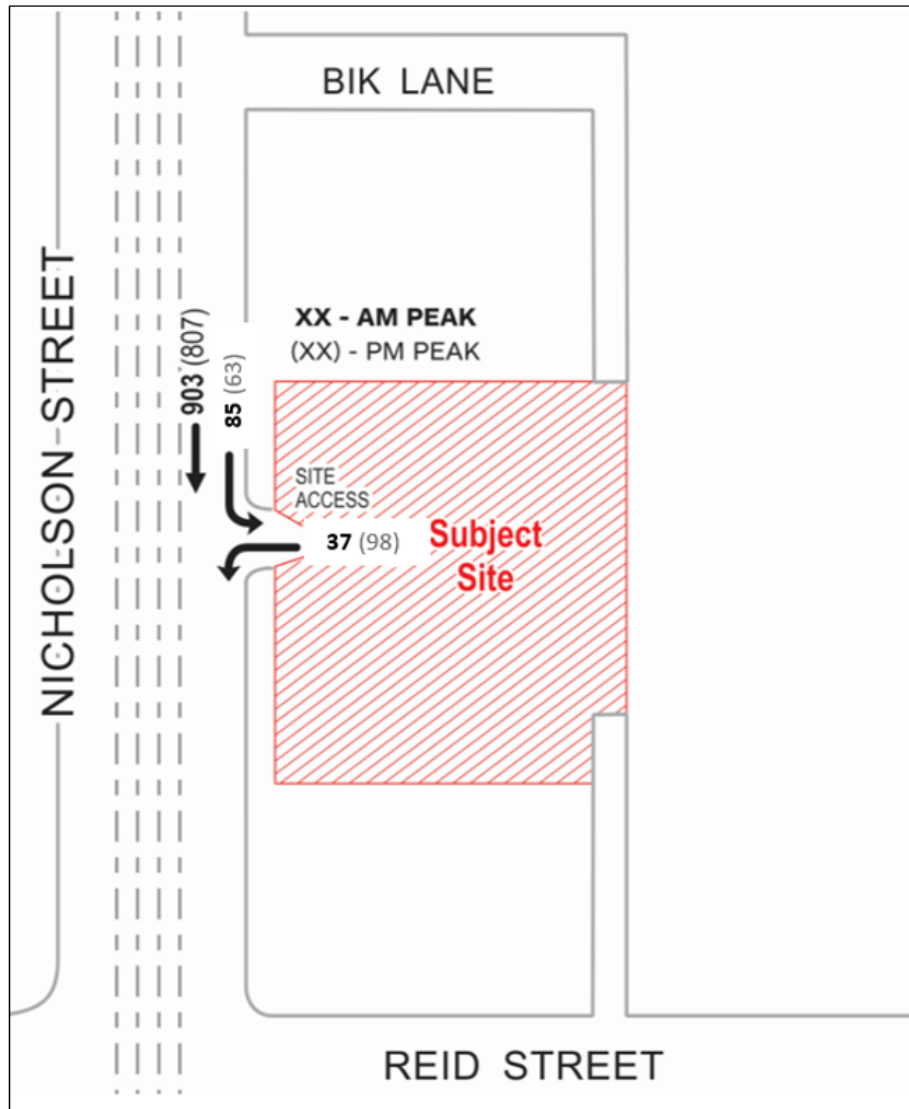
On the basis of the above, it is estimated that the development will generate traffic at a rate of 118 vehicles per hour during the morning peak hour periods and 157 vehicles per hour during the afternoon peak hour periods.

5 Traffic Distribution

The proposed vehicle access point is limited to left-in, left-out vehicle movements due to the presence of the central median and tram lines along Nicholson Street. Accordingly, all vehicles will enter the site from the north along Nicholson Street and depart to the south along Nicholson Street.

Figure 5.1 shows the overall traffic volumes (site generated traffic and existing volumes) at the Nicholson Street access point during the AM and PM peak hours.

Figure 5.1: Overall Traffic Volumes



6 Traffic Impact

To assess the impact of the development traffic on Nicholson Street, a SIDRA analysis has been undertaken at the proposed vehicle access point along Nicholson Street during the AM and PM peak hours.

SIDRA is a computer software program that was developed by the Australian Road Research Board (ARRM) to design and analyse the performance of both signalised and unsignalised intersections.

The parameters used to assess the intersections are summarised below.

Degree of Saturation (D.O.S.) is a ratio of arrival (or demand) flow to capacity. Degrees of saturation above 1.00 represent oversaturated conditions and degrees of saturation below 1.00 represent under saturated conditions. The D.O.S. ratings are detailed in Table 6.1 below.

Although operating conditions with a degree of saturation of close to 1.00 are undesirable, it is acknowledged that this level of congestion is typical of many metropolitan intersections during the AM and PM peak hours.

Table 6.1: Degree of Saturation Ratings

Degree of Saturation (D.O.S.)	Rating
Up to 0.6	Excellent
0.61 – 0.70	Very Good
0.71 – 0.80	Good
0.81 – 0.90	Fair
0.91 – 1.00	Poor
Greater than 1.00	Very poor

The **95th percentile queue length (95%ile queue)** is the value below which 95 percent of all observed cycle queue lengths fall, or 5 percent of all observed queue lengths exceed.

Average Delay is the average time, in seconds, that vehicles can be expected to wait at an intersection.

Table 6.2 below outlines the AM and PM peak hour operation of the Nicholson Street access point.

Table 6.2: SIDRA Results – Nicholson Street Access Point

Approach	Movement	AM PEAK			PM PEAK		
		D.O.S.	95%ile Queue (m)	Average Delay (s)	D.O.S.	95%ile Queue (m)	Average Delay (s)
Site Access Point (east)	Left	0.050	1.4	7.9	0.128	3.7	7.8
Nicholson Street (north)	Left	0.272	0.0	5.5	0.239	0.0	5.5
	Through	0.272	0.0	0.0	0.239	0.0	0.0
All vehicles		0.272	1.4	0.8	0.239	3.7	1.2

The SIDRA results demonstrate the following:

- The vehicle access point will operate under 'Excellent' conditions in both the AM (0.272 DOS) and PM peak hour periods (0.239 DOS);
- Vehicles are able to depart the site onto Nicholson Street with minimal queues and delays in both the AM and PM peak hours; and
- Traffic entering and exiting the site will have minimal impact on through traffic along Nicholson Street.

Detailed SIDRA results are attached in Appendix A.

On the basis of the above analysis, it is concluded that the level of traffic generated by the proposal can suitably be accommodated by Nicholson Street. This is expected given that the site access is limited to left-in, left-out movements.

7 Proposed Tram Stop Works

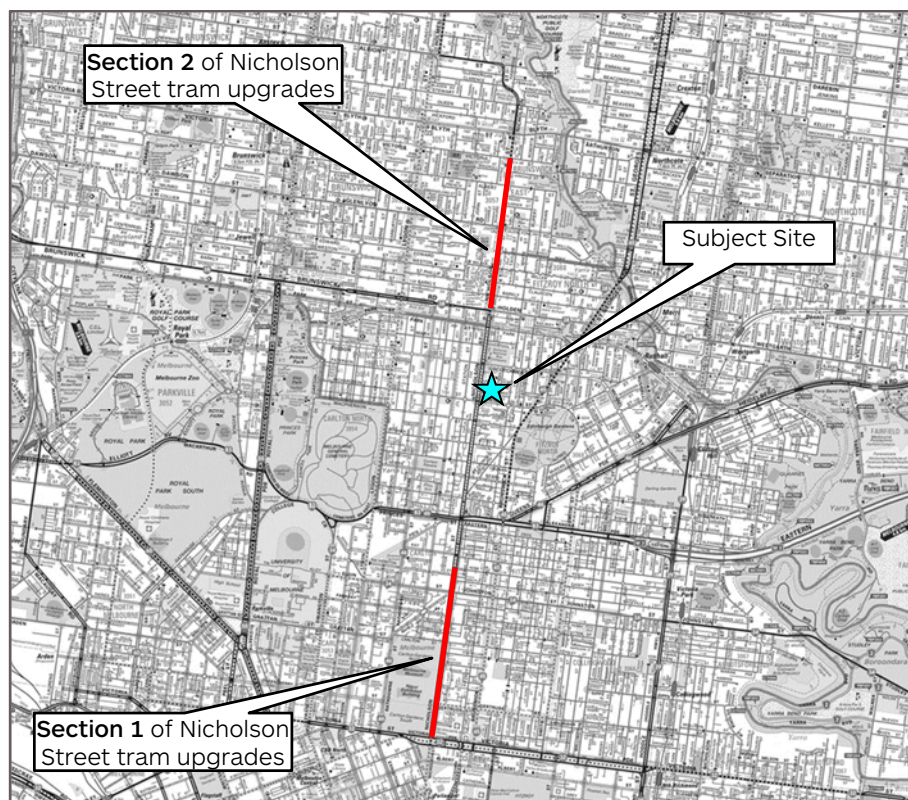
Separate to the traffic analysis discussed above, it was noted within Council's strategic transport comments that tram stops along the length of Nicholson Street are proposed to be upgraded for DDA compliance.

Based on information available on the Public Transport Victoria (PTV) website, six tram stops on Nicholson Street are currently planned to be upgraded in two 1.3km long sections, as follows:

- Section 1: Stops 11 – 15, Victoria Parade to Kerr Street; and
- Section 2: Stops 23 – 25, Brunswick Road to Victoria Street.

Figure 7.1 illustrates the sections of Nicholson Street planned to be upgraded.

Figure 7.1: Proposed Tram Stop Upgrade Sections



Tram Stop 20 is located directly fronting the subject site on Nicholson Street and based on information provided from PTV is not currently planned to be upgraded. In relation to future upgrades of the remaining tram stops along Nicholson Street, PTV notes the following:

The remaining tram stops 16 to 22 on Route 96 will be the next priority stops to receive an accessibility upgrade.

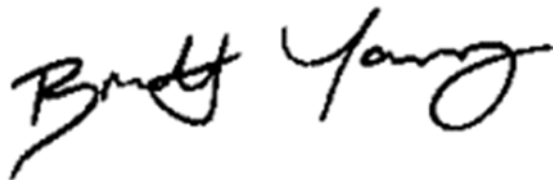
It is considered unlikely that any proposed upgrade works to Tram Stop 20 would adversely impact vehicle access to the subject site, particularly given that vehicle access is already limited to left-in, left-out vehicle movements along Nicholson Street.

It also noted that Council was satisfied that the proposed tram stop works would not conflict with the proposed development, stating the following:

Council officers are currently collaborating with PTV on the construction of new DDA compliant tram-stops along the length of Nicholson Street. I have considered the likely impact of the proposed development on the

currently proposed tram stop designs and am comfortable the two proposals will not be in conflict with each other.

The information above and attached is considered to have addressed the traffic concerns raised. Should you wish to discuss anything further, please contact the undersigned or James McKenzie on 03 9429 3111.

A handwritten signature in black ink that reads "Brett Young". The signature is written in a cursive, flowing style.

Brett Young
Director: Traffic
Ratio Consultants Pty Ltd

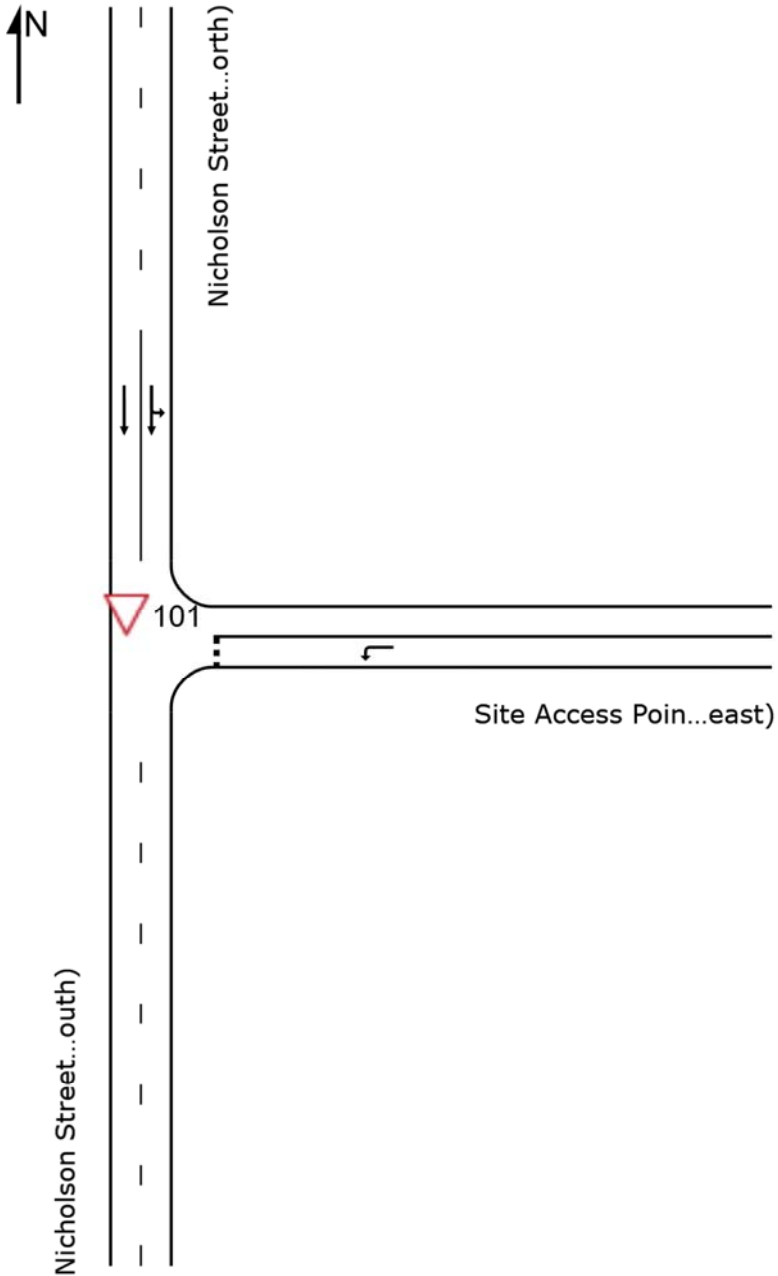


Appendix A Detailed SIDRA Results

SITE LAYOUT

▽ Site: 101 [NISAAMEV1]

Nicholson Street Site Access Point Post Development Volumes AM Peak Hour Run 1
Site Category: (None)
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: 101 [NISAAMEV1]

Nicholson Street Site Access Point Post Development Volumes AM Peak Hour Run 1
 Site Category: (None)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Site Access Point (east)												
4	L2	39	0.0	0.050	7.9	LOS A	0.2	1.4	0.46	0.65	0.46	46.7
Approach		39	0.0	0.050	7.9	LOS A	0.2	1.4	0.46	0.65	0.46	46.7
North: Nicholson Street (north)												
7	L2	89	0.0	0.272	5.5	LOS A	0.0	0.0	0.00	0.10	0.00	56.4
8	T1	951	0.0	0.272	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	58.6
Approach		1040	0.0	0.272	0.5	NA	0.0	0.0	0.00	0.05	0.00	58.2
All Vehicles		1079	0.0	0.272	0.8	NA	0.2	1.4	0.02	0.07	0.02	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.
 SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
 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 [NISAPMEV1]

Nicholson Street Site Access Point Post Development Volumes PM Peak Hour Run 1
 Site Category: (None)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Site Access Point (east)												
4	L2	103	0.0	0.128	7.8	LOS A	0.5	3.7	0.46	0.67	0.46	46.8
Approach		103	0.0	0.128	7.8	LOS A	0.5	3.7	0.46	0.67	0.46	46.8
North: Nicholson Street (north)												
7	L2	66	0.0	0.239	5.5	LOS A	0.0	0.0	0.00	0.09	0.00	56.6
8	T1	849	0.0	0.239	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	58.8
Approach		916	0.0	0.239	0.4	NA	0.0	0.0	0.00	0.04	0.00	58.4
All Vehicles		1019	0.0	0.239	1.2	NA	0.5	3.7	0.05	0.11	0.05	56.1

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.
 SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.