



South Grafton Traffic Study Microsimulation Model Report

Roads & Traffic Authority: Northern Region
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1. Introduction

1.1 Background

The Bent Street commercial precinct is currently experiencing growth in development traffic. The Clarenza area (east of South Grafton) is expected to experience residential growth which will generate increased traffic in and around the South Grafton area.

The Roads and Traffic Authority of NSW Northern Region (RTA) in partnership with the Clarence Valley Council (CVC) have commissioned GTA Consultants to undertake a traffic study of the South Grafton area to review the existing road network and to assess its ability to cope with expected future development and increased traffic demand.

The study included the development of a Q-Paramics Model to determine the capacity in the existing road network and determine what changes will need to be made in the future to facilitate safe and efficient vehicle movement.

1.2 Purpose of This Report

This report sets out an assessment the existing traffic conditions within the study area and assesses expected future traffic conditions, including consideration of the following aims:

- i Development of a comprehensive traffic management scheme for the South Grafton area that will identify key improvement works required, both now and in the future;
- ii Evaluate the current performance of the network and assess the latent traffic capacity;
- iii Assess the impact of planned (approved) and future development on the existing network;
- iv Determine key network infrastructure requirements for vehicles based on predicted growths;
- v Assess the actual impacts of nominated recent developments;
- vi Provide a network micro-simulation model that can be used to make predictions; and
- vii Investigate the potential for improvements based on a number of given scenarios.

1.3 Referenced Documents / Previous Studies

In preparing this report, reference has been made to a number of background documents, including:

- *'Additional Crossing of the Clarence River: Feasibility Study Report'*, The RTA, February 2003;
- *'Traffic Report on Proposed Bunnings Hardware Outlet at Iolanthe Street, Grafton'*, Holland Traffic Consulting Pty Ltd, 28 July 2004;
- *'South Grafton Heights Precinct, A Strategy For The Future'*, Clarence Valley Council, 1 June 2007;
- *'Traffic Impact Study, Proposed High School Residential Subdivision and Commercial Activities, Pacific Highway / Duncans Lane, South Grafton'*, RoadNet, 1 February 2002;

- *'Traffic Impact Assessment, Proposed Homemakers Centre, Iolanthe Street, Grafton'*, RoadNet, 21 November 2005;
- *'Proposed Hungry Jacks, Lot 16 DP 858248, Grafton, Traffic and On-Site Parking Assessment'*, Environmental Resources Management Australia, February 2003;
- *'Draft Contributions Plan 2005 – Iolanthe and Spring Streets Precinct'*, Clarence Valley Council, public exhibition Monday 7 November to Monday 5 December 2005;
- *'Proposed Retail Development, Bent Street, South Grafton, Traffic Engineering Report'*, TTM Consulting Pty Ltd, 26 April 2000;
- *'Traffic Study, Rezoning of Clarenza Release Area for Residential Subdivision'*, RoadNet, 20 May 2005;
- RTANSW *"Guide to Traffic Generating Developments"* 2.2, October 2002;
- Various technical data as referenced in this report;
- An inspection of the site and its surrounds; and
- Other documents as nominated.

2. Existing Conditions

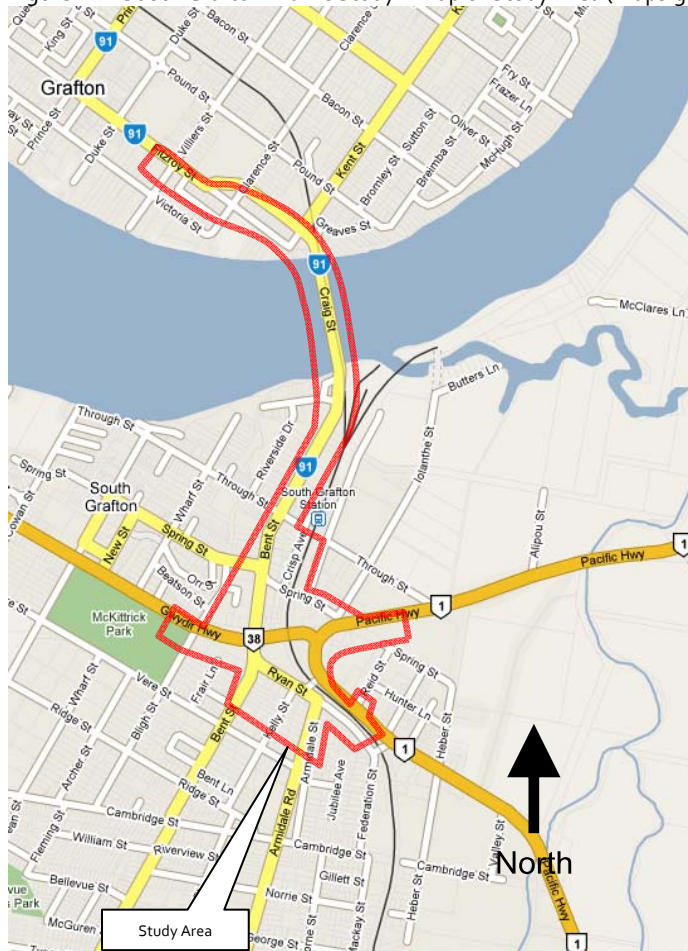
2.1 Study Area

The study area focuses on the main roads through the centre of South Grafton, including:

- Bent Street;
- The Pacific Highway;
- The Gwydir Highway (Charles Street);
- Through Street; and
- Spring Street.

In addition, the model has been extended into the Grafton Township to include the Grafton Bridge and Fitzroy Street extending to Villers Street. A map showing the extents of the study area is shown in Figure 2.1.

Figure 2.1: South Grafton Traffic Study – Map of Study Area (maps.google.com.au)



2.2 Road Network

2.2.1 Adjoining Roads

Bent Street

Bent Street functions as an arterial road, generally aligned in the north-south direction, and connects the South Grafton Township to the Grafton Bridge. Between Ryan Street and Through Street it is a two-way road configured with a four-lane carriageway (two lanes in each direction). North of Through Street, Bent Street narrows to a two-lane carriageway on approach to the Grafton Bridge over the Clarence River. Bent Street is subject to a 50km/hr speed limit through South Grafton.

Kerbside parking is generally not permitted along Bent Street; however some parking lanes exist between Ryan Street and Spring Street.

Counts undertaken in 2004 indicate that Bent Street carries approximately 6,400 vehicles per day and has experienced a 1 – 2% per annum traffic growth in the last 20 years.

Pacific Highway

Pacific Highway is part of the National Highway and is generally aligned in an east-west direction. It is a two-way road configured with a two-lane carriageway and is subject to a 60km/hr speed limit through South Grafton.

The Pacific Highway carries approximately 12,500 vehicles per day near the intersection with Spring Street.

Gwydir Highway (Ryan Street and Charles Street)

Gwydir Highway between Cowan Street and Bent Street, in the section known as Ryan Street is aligned in the east-west connection and is a two-way road configured with a two-lane carriageway. The section east of Bent Street is known as Charles Street.

Ryan Street carries approximately 8,400 vehicles per day.

Spring Street

Spring Street is a local street and is generally aligned in the east-west direction. It provides a connection between Bent Street and the Pacific Highway (Charles Street) and is a two-way road configured with a two-lane carriageway (one in each direction). Spring Street is subject to a 50km/hr speed limit.

The eastern section of Spring Street is restricted to left-in / left-out movements at Bent Street to limit its usage by through traffic.

A parking lane is provided on the south side of Spring Street between Bent Street and Charles Street.

Through Street

Through Street is a local street which is generally aligned in the east-west direction. It is a two-way road configured with a two-lane carriageway.

The eastern approach of Through Street is limited to left turn out only at the Bent Street roundabout during the road network AM peak hour. This seeks to limit the utilisation of the link of Spring Street, Crisp Avenue, Through Street to connect from Charles Street to Bent Street. This also limits the disruption to traffic flow on Bent Street during the AM peak period.

2.2.2 Key Intersections

Key intersections within the study area were identified as follows:

- Gwydir Highway / Pacific Highway is an unsignalised T-intersection with priority to the Pacific Highway;
- Ryan Street (Gwydir Highway) / Bent Street is a roundabout controlled intersection;
- Bent Street / Spring Street, an unsignalised intersection with all movements to and from Spring Street limited to left-turn movements; and
- Bent Street / Through Street, a roundabout controlled intersection with turns from the eastern approach (Through Street) limited to left only between 7.00am and 9.00am weekdays.

2.2.2.1 Traffic Volumes

GTA Consultants undertook traffic movement counts on key roads in the vicinity of the site on the 15th and 16th November 2007 during the following peak periods:

- 7:00am and 10:00am; and
- 4:00pm and 7:00pm.

The traffic turning movement counts were undertaken at the following intersections:

- Bent Street / Through Street;
- Bent Street / Spring Street;
- Pacific Highway / Spring Street;
- Pacific Highway / Gwydir Highway;
- Pacific Highway / Underpass to Ryan Street (Charles Street);
- Pacific Highway / Ryan Street underpass connection;
- Bent Street / Gwydir Highway; and
- Gwydir Highway / Bligh Street.

The existing AM and PM peak hour traffic volumes are shown in Appendix F.

2.3 Site Observations

GTA Consultants conducted on-site field observations during the road network AM and PM peak hour on Thursday 15 November 2007.

The key observation in the AM peak hour was the extent of queuing on Bent Street south of the bridge over the Clarence River. Traffic congestion formed from the bridge and extended to the Gwydir Highway roundabout and the Pacific Highway. During the time of observation, the queue did not extend into the through traffic lanes of the Pacific Highway. However, the right and left turning lanes into the Gwydir Highway from the Pacific Highway experienced difficulty performing this manoeuvre.

During the PM peak hour, traffic congestion was observed on the north side of the Clarence River which is due to the reduced bridge capacity. The congestion extended from the bridge to Craig Street and Fitzroy Street.

2.3.1 Public Transport

Figure 2.2 shows the existing public transport routes within the Grafton and South Grafton area.

Figure 2.2: Public Transport Map



The Grafton railway station is located in South Grafton on Through Street, east of Bent Street.

3. Micro-Simulation Modelling

3.1 Introduction

The South Grafton Model was developed using Q-Paramics which is a microsimulation modelling package developed by Quadstone in Edinburgh, Scotland and used in a number of countries around the world including Australian universities, traffic authorities and consultants.

Microsimulation modelling is a computer software package that has the ability to individually model each vehicle, including buses, taxis, trains, trams, etc. within a road network. It enables a realistic representation of driver behaviour such as overtaking and lane changing and can also illustrate network performance. It also allows testing of how the method of control and signal timings can be modified to ensure that more effective congestion management strategies can be designed and tested.

In all cases where designed options are being tested, it is fundamental that accurate models of the existing conditions are developed. The base models must be validated using site-measured data to ensure that any proposal can be compared to a reliable base model.

The process for developing and applying a microsimulation model to a specific traffic analysis generally consists of the following tasks:

Task 1: Identification of the extents of the study area;

Task 2: Data collection;

Task 3: Existing conditions model development;

Task 4: Validation and calibration of existing conditions model including error checking; and

Task 5: Alternative options analysis.

Details of the five tasks are set out in this report.

3.2 Purpose of the Microsimulation Model

Microsimulation models are generally prepared in cases where an existing network is approaching over-saturated conditions or where a proposed scheme may impact on the existing traffic operation of a network. In such cases the impact of over-saturation on intersections and how their method of control and function can be modified to make sure strategies are designed and tested.

The unique features of South Grafton required that the selected software, in this case Q- Paramics, is able to analyse the existing traffic conditions.

The objective of the microsimulation modelling is as follows:

The microsimulation models are required to have the ability, to be used in the future, to evaluate the impact of future road improvement projects, and to identify the need for any such works.

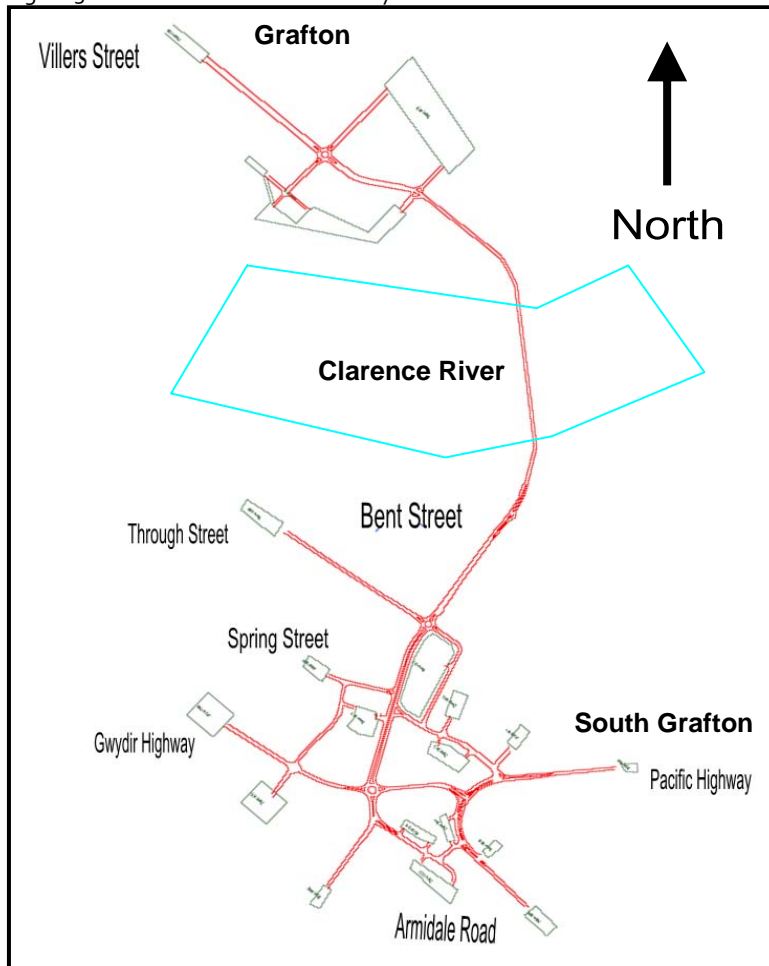
3.3 Model Extents

The study area includes the key roads located within the town centre of South Grafton, including:

- Bent Street;
- The Pacific Highway;
- The Gwydir Highway (Charles Street & Ryan Street);
- Through Street; and
- Spring Street.

The model has been extended into the Grafton Township to include the Grafton Bridge and Fitzroy Street, extending to Villers Street. Figure 3.1 shows the extent of the Q-Paramics model.

Figure 3.1: South Grafton Traffic Study - Model Extents



3.4 Data Collection

3.4.1 Road Network Inventory

Aerial photography was used as a basis for defining road network geometry. To gather further information regarding turn bans, speed limits, etc, site inspections were carried out on 15 and 16 November 2007.

3.4.2 Traffic Volumes

Traffic volume data was obtained from a number of sources:

- Traffic volume data was collated from historical data provided by the CVC and RTA;
- Detailed turning movement surveys were conducted during the AM and PM peak periods at the following intersections on the 15th and 16th November 2007:
 - Bligh Street / Gwydir Highway,
 - Bent Street / Gwydir Highway / Ryan Street,
 - Ryan Street / Railway Underpass / Pacific Highway,
 - Pacific Highway / Gwydir Highway,
 - Spring Street / Pacific Highway / Iolanthe Street,
 - Spring Street / Bent Street,
 - Through Street / Bent Street; and
- Origin-destination surveys were undertaken during the AM and PM peak periods to ascertain an understanding of the traffic patterns throughout the study area and to provide a basis for the matrix estimation.

3.4.3 Public Transport Services

Route and timetable information for on-road public transport services within the study area have been sourced from the 'Busways' website¹. Details of the bus routes are shown in Section 2.3.1.

3.4.4 Queue Lengths

GTA Consultants undertook site inspections of the study area on the 15th and 16th November 2007. These were used to record the operation of the traffic and how the queues behaved on the survey days. These results were used to validate the model by using the recorded end of queue conditions and adjusting the model to approximately replicate the observed conditions.

¹ www.busways.com.au

3.4.5 Travel Times

Travel time information was sourced from the report entitled 'Additional Crossing of the Clarence River' prepared for the RTA.

This report was the result of a campaign formed by a group of business owners for a second river crossing in 2001. The report notes the additional crossing of the Clarence River and the need for an additional link over the Clarence River, to improve connectivity between Grafton and South Grafton, has been discussed for many years. The existing bridge was opened to vehicular traffic in 1932 and initial correspondence with relation to a second crossing dates back to 1960. The purpose of the study was to:

- "Identify broad strategic locations between Seelands and Maclean for an additional crossing of the Clarence River;
- Determine the traffic, community, environment and engineering impacts for each of the strategic locations; and
- Identify the broad strategic locations that are feasible for an additional crossing."

As part of the study, a community questionnaire was conducted with some 1,900 responses received. The responses included 73% of persons having experienced delays on the bridge either daily (37%) or weekly (36%).

The study also recorded travel times for the section of Bent Street between the Gwydir Highway (Ryan Street) and Villers Street in various peak and off-peak periods. A summary of the recorded travel time for the 1.9km stretch of road is provided in Table 3.1.

Table 3.1: South Grafton Traffic Study – 2001 Travel Time Survey Results

Peak Period	Northbound	Southbound
Off-peak	2 mins and 30 seconds (approx 45km/hr)	2 mins and 30 seconds (approx 45km/hr)
AM Peak	7 mins and 30 seconds (approx 15km/hr)	3 mins (approx 40km/hr)
PM Peak	3 mins (approx 40km/hr)	5 mins (approx 30km/hr)

During the AM peak period, the northbound travel time tripled the off-peak travel time, with the southbound travel time over one minute slower than the off-peak during the PM peak period.

3.4.6 Traffic Demand Assessment

Micro-simulation models define traffic demands in the form of vehicle trips between origins and destinations, known as zones. Hence, existing and future traffic demands have to be developed in this format, known as an origin destination (OD) matrix.

Zones are defined to represent areas or locations of major traffic generation, a total of 19 zones have been modelled within the study area. The volume of traffic to and from each zone is estimated using roadway traffic counts and an estimation on the area's size and type of land use. All of this information is combined to develop an origin destination matrix which is simulated in Paramics and refined to ensure modelled traffic volume match those observed on the roads within the study area.

The Origin-Destination surveys undertaken on the 15th and 16th of November 2007 during the AM and PM peak periods provided a key input into the matrix estimation process.

3.4.7 Model Time Periods

The following two peak periods were analysed:

- AM Peak (7:00 – 10:00); and
- PM Peak (16:00 – 19:00).

Each of the periods allowed for a warm up and warm down period. To add to the level of accuracy of the existing conditions model, the traffic flow demand profile through the network was input in 15 minute intervals.

3.5 Existing Conditions Calibration and Validation

3.5.1 Introduction

The main purpose of the modelling study is to assess the current operating conditions on the network and to determine how any potential options affect this operation. Therefore, to understand the changes required and to take appropriate measures to manage them, it is essential that the existing conditions is accurate. In all cases, it is a fundamental requirement of the design process that accurate models are built for existing conditions. The models must then be validated using site-measured data to ensure that any proposals or mitigation works can be fully compared to a reliable baseline.

3.5.2 Calibration and Validation Guidelines

Calibration and validation is the process of ensuring the modelled traffic conditions match observed data. The process was carried out generally in accordance with the RTA NSW "Paramics Micro-simulation Modelling Manual for Modellers", dated December 2006, which provides recommended criteria for calibration and validation.

The targets set out in the guidelines are shown in Table 3.2.

Table 3.2: South Grafton Traffic Study – Calibration and Validation Criteria

Criteria and Measurements	Calibration Acceptable Targets
Hourly Turning Movements, Modelled Versus Observed	
Within 20% or 200 veh/h	> 95% of cases
Within 10% or 100 veh/h	> 90% of cases
Within 5% or 50 veh/h	> 80% of cases
Travel Times, Model Versus Observed	
Journey Times Within 15% (or 1 min, if higher)	> 85% of cases
Visual Audits	
Visually Acceptable Speed-Flow Relationship	To analyst's satisfaction
Visually Acceptable Queuing	To analyst's satisfaction

Seed Runs

In order to test the robustness of the model, five seeds were tested and the average results of the five seed runs were reported. The seed runs utilised in this analysis are 28, 560, 2849, 7771 and 86524.

3.5.3 Calibration and Validation Results

Hourly Turning Movements

Tables 3.3 and 3.4 summarise the hourly turning movement comparison between the modelled and observed flows at the key intersections within the study area.

Table 3.3: South Grafton Traffic Study - Existing Conditions AM Calibration Summary

Time Period	8:00 – 9:00			9:00 – 10:00		
Criteria	No. of turn flows within 20% or 200 vehicles	No of turn flows within 10% or 100 vehicles	No of turn flows within 5% or 50 vehicles	No. of turn flows within 20% or 200 vehicles	No of turn flows within 10% or 100 vehicles	No of turn flows within 5% or 50 vehicles
Target	>95%	>90%	>80%	>95%	>90%	>80%
Results	100%	99%	91%	99%	99%	88%

Table 3.4: South Grafton Traffic Study - Existing Conditions PM Calibration Summary

Time Period	16:00 – 17:00			17:00 – 18:00		
Criteria	No. of turn flows within 20% or 200 vehicles	No of turn flows within 10% or 100 vehicles	No of turn flows within 5% or 50 vehicles	No. of turn flows within 20% or 200 vehicles	No of turn flows within 10% or 100 vehicles	No of turn flows within 5% or 50 vehicles
Target	>95%	>90%	>80%	>95%	>90%	>80%
Results	100%	100%	92%	99%	96%	87%

Tables 3.3 and 3.4 indicate that the modelled flows for both peak periods meet the flow criterion set in the guidelines and therefore provide satisfactorily calibrated base models.

Travel Time Results

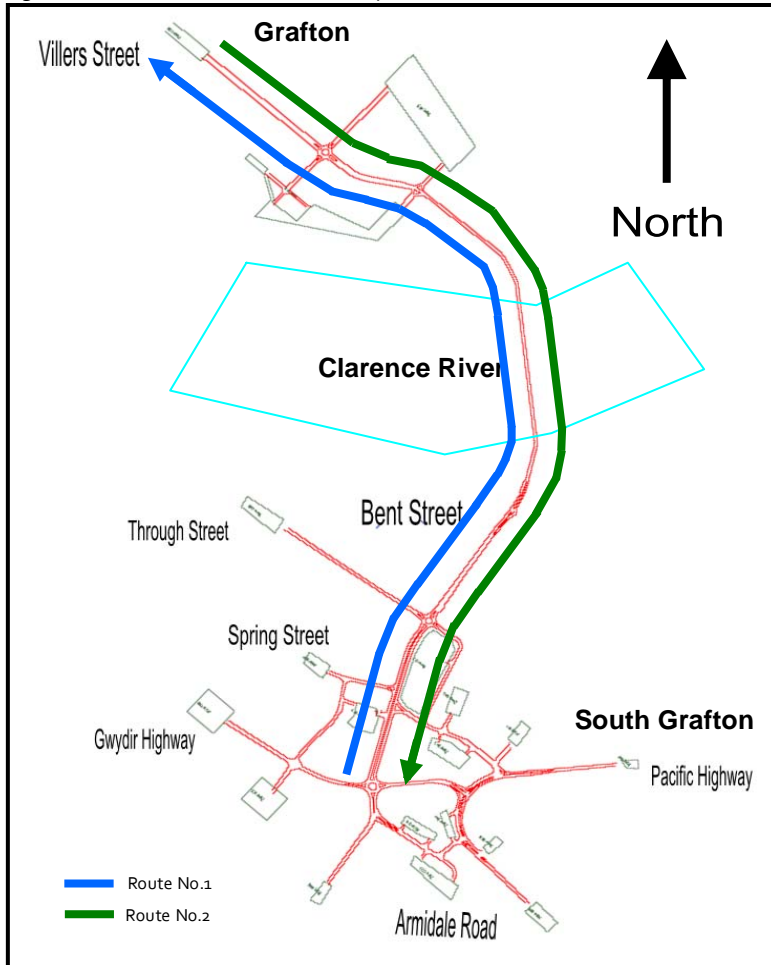
Vehicle travel times for the two routes nominated in Section 3.4.5 were compared with data extracted from the model. The following two routes were recorded from the model and compared to the observed values:

- **Route 1:** Bent Street North Bound Gwydir Highway to Villers; and
- **Route 2:** Bent Street South Bound Villers to Gwydir Highway.

Graphical illustrations of the two routes are shown in Figure 3.2.

micro-simulation modelling

Figure 3.2: South Grafton Traffic Study- Travel time routes



The comparison between observed and modelled travel times are shown in Tables 3.5 and 3.6.

Table 3.5: South Grafton Traffic Study - Existing Travel Time Results (AM Peak) (Unit: Sec)

Route No.	Travel Time Run	Observed	8:30 - 9:00	9:00 - 9:30	% Diff.	% Diff.
1	Bent Street Northbound (Gwydir Hwy to Villers Street)	450	430	498	4%	10.7%
2	Bent Street Southbound (Villers Street to Gwydir Hwy)	180	182	172	1.1%	4.4%

Table 3.6: South Grafton Traffic Study - Existing Travel Time Results (PM Peak) (Unit: Sec)

Route No.	Travel Time Run	Observed	16:30 - 17:00	17:00 - 17:30	% Diff.	% Diff.
1	Bent Street Northbound (Gwydir Hwy to Villers Street)	180	190	194	5.6%	7.8%
2	Bent Street Southbound (Villers Street to Gwydir Hwy)	300	312	328	4%	9.3%

The results presented in Table 3.5 and 3.6 indicate that the journey times meet the requirements set out in the validation criteria.

In addition to the routes utilised for validation of the model, the travel times for an additional ten routes were extracted from the model to provide a basis for comparison for future year test option scenarios. The results of the modelled travel times for the routes are shown in Table 3.7.

Table 3.7: South Grafton Traffic Study – Existing Conditions Modelled Travel Time Results (Unit: Secs)

Route No.	Travel Time Run	8:30 – 9:00	9:00 - 9:30	16:30 - 17:00	17:00 – 17:30
3	Reid Street to Villers Street NB	526	574	278	294
4	Villers Street to Reid Street SB	288	210	344	360
5	Bligh Street to Villers Street NB	456	634	202	212
6	Villers Street to Bligh Street SB	200	194	336	348
7	Spring St to Bent St via Gwydir WB	129	45	76	87
8	Bent St to Pacific Hwy via Gwydir EB	75	21	20	21
9	Spring St to Villers St via Gwydir NB	548	670	284	296
10	Villers St to Spring via Gwydir SB	250	198	336	348
11	Wharf Street to Bent Street EB	324	578	22	22
12	Bent Street to Wharf Street WB	20	20	20	20
Total		2816	3144	1918	2008

N/A – No available existing travel time data

The comparisons of future year travel times for each of the routes in Table 3.7 are located in Appendix E.

Queues

Model observations indicate that each of the peak periods experience high levels of congestion and long queues that block a number of intersections. This included the following observations:

- The AM peak hour experienced queuing on Bent Street south of the bridge over the Clarence River. The queue lengths extended from the Grafton Bridge to the Ryan Street roundabout and the Pacific Highway;
- The AM peak period did not experience queuing that extended into the through traffic lanes of the Pacific Highway, however, the right and left turning lanes into the Gwydir Highway experienced difficulty performing this manoeuvre for short periods; and
- The PM peak period experienced traffic congestion on the north side of the Clarence River which is due to capacity of the Grafton Bridge. The queue lengths extended from the bridge to Craig Street and Fitzroy Street.

The existing conditions model reflect the levels of congestion and queue lengths observed during each of the peak periods and is considered satisfactory for the purposes of options testing.

micro-simulation modelling

The queue length characteristics for the following three intersections were extracted from the model to provide a basis for comparison for future year test option scenarios:

- Bent Street / Gwydir Highway;
- Pacific Highway / Gwydir Highway ; and
- Bent Street / Through Street.

The results of the modelled queue lengths are set out in Tables 3.8 – 3.10.

Table 3.8: South Grafton Traffic Study - Queue Summary Gwydir Hwy / Bent Street – AM Peak (PM Peak)

Approach	AVG Q (vehs) ²	Max Q(vehs) ³	95% Queue ⁴
Gwydir Hwy E App	9 (5)	18 (9)	16 (8)
Gwydir Hwy W App	11 (3)	25 (6)	25 (5)
Bent Street S App	6 (4)	11 (8)	11 (6)
Bent Street N App	1 (4)	2 (7)	2 (6)

AM Peak – 8.30am – 9.30am

PM Peak – 4.30pm-5.30pm

Table 3.9: South Grafton Traffic Study - Queue Summary Bent Street / Through Street – AM Peak (PM Peak)

Approach	AVG Q (vehs)	Max Q(vehs)	95% Queue
Crisp Avenue E App	2 (2)	6 (4)	5 (3)
Through Street W App	49 (2)	55 (3)	54 (2)
Bent Street S App	42 (3)	59 (6)	57 (5)
Bent Street N App	1 (1)	2 (3)	2 (2)

AM Peak – 8.30am – 9.30am

PM Peak – 4.30pm-5.30pm

Table 3.10: South Grafton Traffic Study - Queue Summary Pacific Highway / Gwydir Highway – AM Peak (PM Peak)

Approach	AVG Q (vehs)	Max Q(vehs)	95% Queue
Gwydir Highway W App	2 (1)	11 (4)	8 (3)
Pacific Highway S App Slip Lane	0 (0)	2 (0)	1 (0)
Pacific Highway N App Right Turn	1 (0)	2 (0)	2 (0)

AM Peak – 8.30am – 9.30am

PM Peak – 4.30pm-5.30pm

² Average Queue is defined to be the total queue length (in vehicles) observed over the entire analysis time period.

³ Max Queue is defined to be the longest queue length (in vehicles) that observed during the analysis time period.

⁴ 95% Queue is defined to be the queue length (in vehicles) that has only a 5-percent probability of being exceeded during the analysis time period.

3.5.4 Network Performance

Network characteristics for all vehicles within the simulation period have been extracted from the model to obtain an understanding of the operation and a platform for options testing comparisons. The following statistics were extracted from the model:

- Average trip time per vehicle (mins);
- Average distance travelled per vehicle (km);
- Average Speed per vehicle (km/hr);
- Average delay per vehicle (mins); and
- Average No. of stops per vehicle.

All the statistics recorded are for the completed trips within the model. Table 3.11 shows the network statistics for the AM and PM peak periods.

Table 3.11: South Grafton Traffic Study – Network Performance

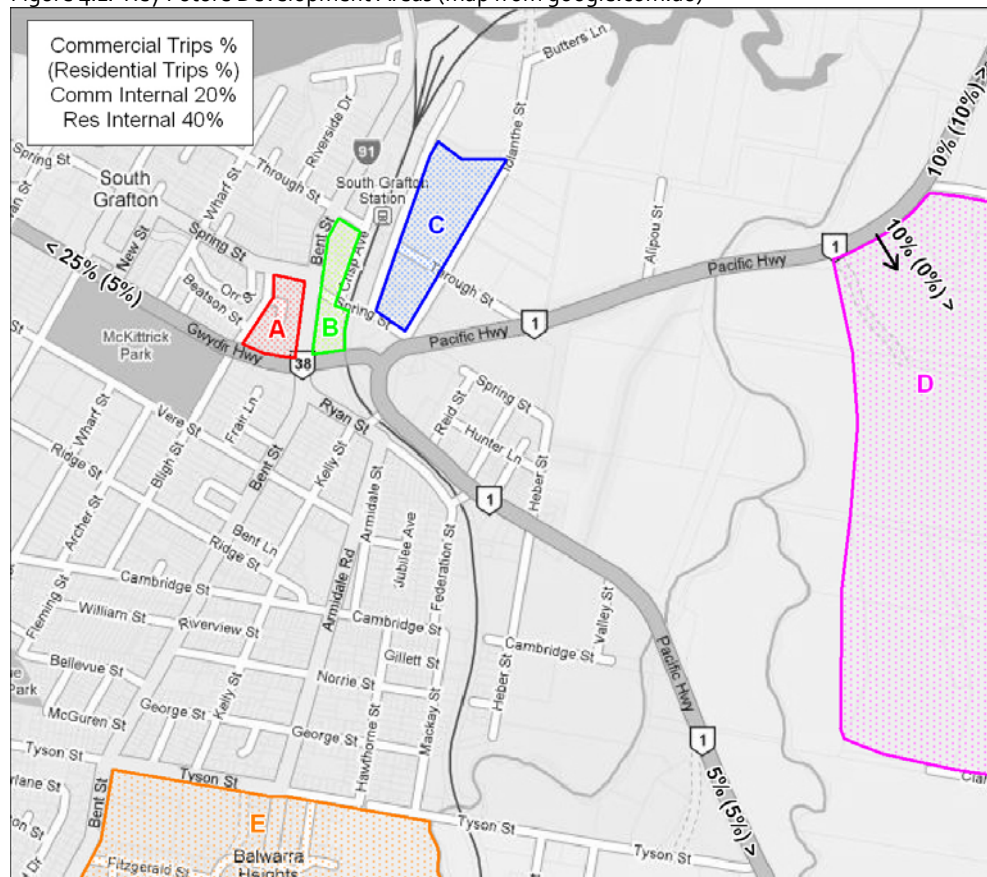
	Average Trip Time per Vehicle (m:s)	Average Distance per vehicle (km)	Average Speed per vehicle (km/hr)	Average Delay per vehicle (m:s)	Average No. of Stops per vehicle		
					Cars	Light	Heavy
Existing AM (8.30am – 9.30am)	5:25	1.75	20.2	2:54	4.42	4.17	3.69
Existing PM (4.30pm – 5.30pm)	4:07	1.68	24.9	1:41	2.61	2.46	2.31

4. Future Year Land Use Assumptions

4.1 Land Use and Traffic Generation

Assumed future developments in and around the South Grafton area have been based on land zoning and potential site coverage information provided by the CVC and are illustrated graphically in Figure 4.1.

Figure 4.1: Key Future Development Areas (map from google.com.au)



The estimated development size for each of the five areas is based on a proportion of the land area. In addition, the traffic generation rates which will be applied to the land uses have been based on information contained in GTA Consultants' traffic generation database and NSW RTA's Guide to Traffic Generating Developments (2002).

The assumed distribution of traffic associated with the future land uses is based on the current behaviour of traffic in the study area and the consideration of likely traffic attractors (such as Grafton Township etc.).

Table 4.1 summarises the anticipated future development for the nominated design years of 2013 (5 year growth), 2018 (10 year growth) and 2028 (20 years growth). It also lists the assumptions in terms of traffic generation rates and the sources of the information.

future year land use assumption

Table 4.1: South Grafton Traffic Study - Summary of future year development traffic

Year	Area	Size			Pk Hr Gen AM (PM)
2013	A	500	sqm	Retail	10 (50)
	B	400	sqm	commercial	8 (8)
		100	sqm	retail	2 (10)
	C	3000	sqm	light ind / bulky	15 (75)
	D	250	lots	res lots	213 (213)
		200	sqm	Retail	4 (20)
		80	sqm	commercial	2 (2)
	E	150	lots	res lots	128 (128)
Total					381 (505)
2018	A	1000	sqm	Retail	20 (100)
	B	1600	sqm	commercial	32 (32)
		400	sqm	retail	8 (40)
	C	10000	sqm	light ind / bulky	50 (250)
	D	400	lots	res lots	340 (340)
		300	sqm	Retail	6 (30)
		120	sqm	commercial	2 (2)
	E	300	lots	res lots	255 (255)
Total					713 (1049)
2028	A	2000	sqm	Retail	40 (200)
	B	3200	sqm	commercial	64 (64)
		800	sqm	retail	16 (80)
	C	14000	sqm	light ind / bulky	70 (350)
	D	700	lots	res lots	595 (595)
		400	sqm	Retail	8 (40)
		180	sqm	commercial	4 (4)
	E	600	lots	res lots	510 (510)
Total					1307 (1843)

Table 4.1 anticipates an additional 380 to 500 vehicle movements during the peak hours by 2013 and up to 1300 to 1850 additional peak movements by 2028 during the peak hours.

future year land use assumption

The anticipated additional traffic volumes were distributed onto the existing network via the following method:

- Area A – via Zone 12;
- Area B – via Zone 17;
- Area C – via Zone 10;
- Area D – via Zone 1; and
- Area E – 75% via Zone 3 and 25% via Zone 4.

Detailed information on the future traffic volume and estimates are shown in Appendix B.

Base Network / General Traffic Growth

Historical data for the base network traffic growth has been provided by the Roads and Traffic Authority for a number of key locations within the study area. This information indicates the following traffic growth on key links to 2004:

- Pacific Highway: 6% per annum traffic growth for the last six years
3% - 5% per annum traffic growth for the last 15 years
- Gwydir Highway: 3.5% per annum traffic growth for the last six years
1% per annum traffic growth for the last 15 years

On the basis of the above:

- A 5% per annum traffic growth has been adopted on the Pacific Highway; and
- A 1% per annum traffic growth has been adopted on all other road links to external zones 6 (Gwydir Highway) and 9 (Grafton).

GTA Consultants believes the assessment of this growth in addition to the developmental traffic growth to be conservative.

5. Options Testing

5.1 Modelled Scenarios

In determining the required mitigating works within the study area that will facilitate the future year development and growth, a number of options have been developed.

The options have been developed in consultation with the RTA and CVC to determine the most appropriate and feasible options.

Each of the options was tested for the following design years:

- 2007 (Existing traffic demands);
- 2013 (5 year growth);
- 2018 (10 year growth); and
- 2028 (20 year growth).

In total, ten options are identified to be tested in both the AM and PM peak periods, which are as follows:

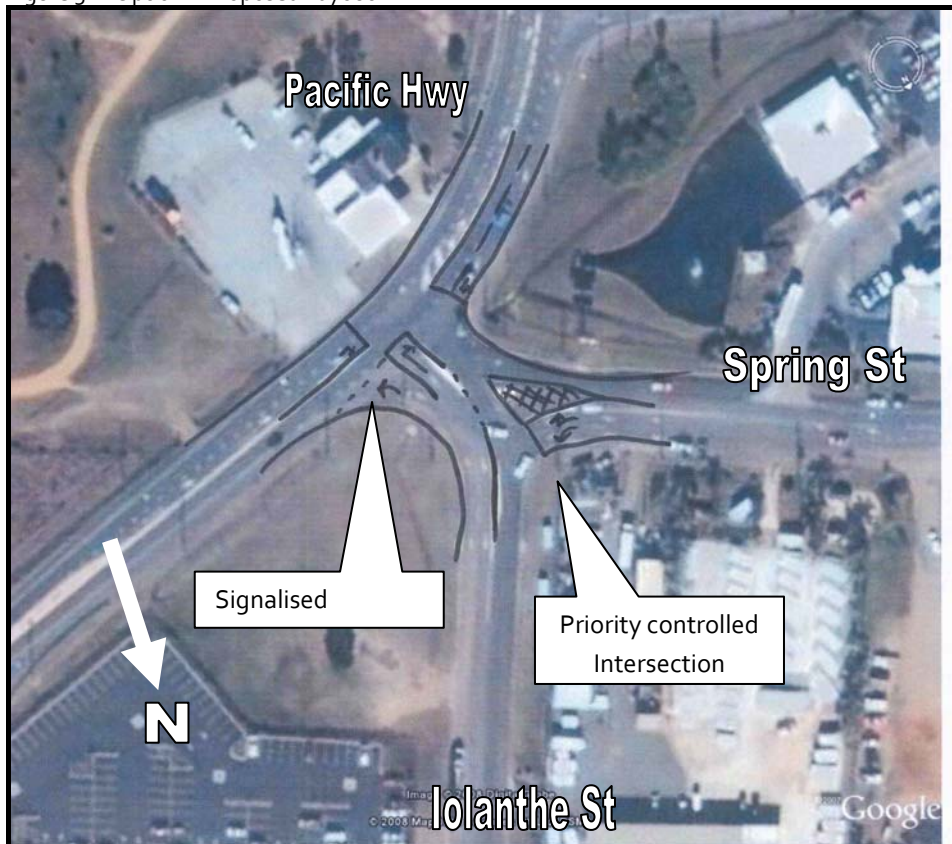
Option 1 includes the introduction of two traffic lanes in each direction on Charles Street between the Pacific Highway and Bent Street.

Option 2 includes the following:

- All items identified in Option 1; and
- Introduction of Traffic Signals at the Iolanthe Street / Spring Street / Pacific Highway Intersection, incorporating:
 - Dedicated turning lanes on all approaches,
 - A single through lane on both approaches of the Pacific Highway; and
 - Left turn slip lanes on all approaches.

The proposed layout is illustrated schematically in the Figure 5.1.

Figure 5.1: Option 2 Proposed Layout



Option 2B includes the following:

- All items identified in Option 2; and
- The introduction of a controlled roundabout at the intersection of Spring Street and Bent Street.

Option 3 includes the following:

- The introduction of a big roundabout ('big-about') that connects the Pacific Hwy North bound, Pacific Hwy South bound, Gwydir Hwy, Armidale St and Iolanthe St.

A summary of the options and their location are shown graphically in Figure 5.2.

Figure 5.2: South Grafton Traffic Study – Options Summary.



Each of the options has been tested with and without an additional bridge crossing. This crossing assumes two traffic lanes in each direction generally in the same alignment as the existing bridge.

Table 5.1 sets out the options modelled and their design years.

Table 5.1: South Grafton Traffic Study – Test Options and Design Year

Option	Description	Design Year			
		2007	2013	2018	2028
Ex	Existing road network	X	X	X	X
Ex+b*	Additional bridge capacity only		X	X	X
1	Option 1 with existing bridge capacity	X	X	X	X
1+b*	Option 1 with additional bridge capacity		X	X	X
2	Option 2 with existing bridge capacity	X	X	X	X
2+b*	Option 2 with additional bridge capacity		X	X	X
2B	Option 2B with existing bridge capacity	X	X	X	X
2B+b*	Option 2B with additional bridge capacity		X	X	X
3	Option 3 with existing bridge capacity	X	X	X	X
3+b*	Option 3 with additional bridge capacity		X	X	X

* "b": Additional lane over Grafton Bridge to increase the capacity

5.2 Results

In order to quantify the difference between the existing models and the Options tested, the following outputs have been extracted from the model for discussion and evaluation purposes:

- Number of completed vehicle trips per simulation period;
- The peak period travel time for routes 1 and 2; and
- Queue length statistics for key intersections within the study area.

Additional network characteristics for the test options are shown in Appendix F. This includes:

- Average trip time per vehicle;
- Average distance travelled per vehicle;
- Average Speed per vehicle; and
- Average delay per vehicle.

The comparisons of all completed trips during the one hour peak period is summarised in Table 5.2, whilst the two hour peak period is summarised in Table 5.3.

options testing

Table 5.2: South Grafton Traffic Study– Number of completed vehicle trips – 1 hr AM Peak (PM Peak)

Options	Design Year			
	2007	2013	2018	2028
Ex	5653 (6474)	5868 (6954)	6184 (7462)	6671 (2942)
Ex+b*		6230 (7369)	6677 (7862)	7372 (6105)
1	5595 (6358)	5769 (6954)	6067 (7586)	6416 (8370)
1+b*		6177 (7315)	6595 (7947)	7196 (8962)
2	5630 (6426)	5883 (6916)	6137 (7142)	2282 (1965)
2+b*		6161 (7343)	6543 (6893)	1999 (990)
2B	5649 (6400)	5692 (6924)	6056 (7521)	2363 (1422)
2B+b*		6213 (7348)	6494 (7904)	1852 (432)
3	5678 (6810)	5733 (7370)	6080 (7294)	6585 (5526)
3+b*		6388 (7767)	6654 (6289)	7200 (3952)

AM Peak: 8:30-9:30

PM peak: 16:30-17:30

* "b": Additional lane over Grafton Bridge to increase the capacity

Table 5.3: South Grafton Traffic Study– Number of completed vehicle trips – 2hr AM Peak (PM Peak)

Options	Design Year			
	2007	2013	2018	2028
Ex	10834 (12539)	11372 (13412)	11903 (14519)	12894 (7237)
Ex+b*		12012 (14310)	12710 (15359)	13884 (11769)
1	10821 (12393)	11201 (13540)	11868 (14704)	12774 (16548)
1+b*		11942 (14137)	12721 (15325)	13844 (17329)
2	10855 (12469)	11339 (13463)	11903 (14109)	8320 (5438)
2+b*		11920 (14151)	12668 (13211)	8272 (4508)
2B	10850 (12447)	11182 (13465)	11804 (14589)	8428 (4978)
2B+b*		12014 (14136)	12606 (15356)	8273 (4014)
3	10846 (12186)	11244 (13061)	11862 (12845)	12774 (8827)
3+b*		12070 (13829)	12611 (10629)	13570 (7060)

AM Peak: 7:30-9:30

PM peak: 16:00-18:00

* "b": Additional lane over Grafton Bridge to increase the capacity

Tables 5.2 and 5.3 show that for Option 2 and 2B, the design year of 2028 experiences fewer recorded vehicles than the other models, which indicates that the network reaches over saturated conditions prior to this period.

5.2.1 Travel Times

Figures 5.1 – 5.4 show the travel times on the existing road network for each of the design years on Bent Street northbound and southbound during the AM and PM peak periods.

Figure 5.1: Bent Street Northbound (Gwydir Hwy to Villers Street) – AM Peak Average Travel Time Existing Road Network

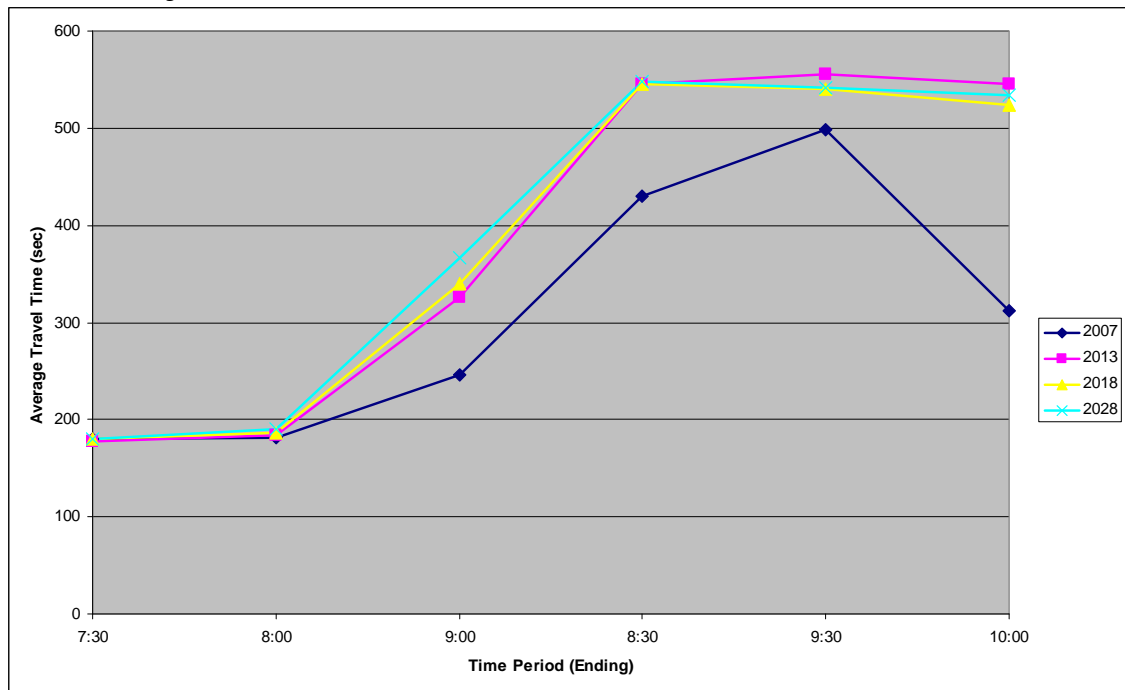
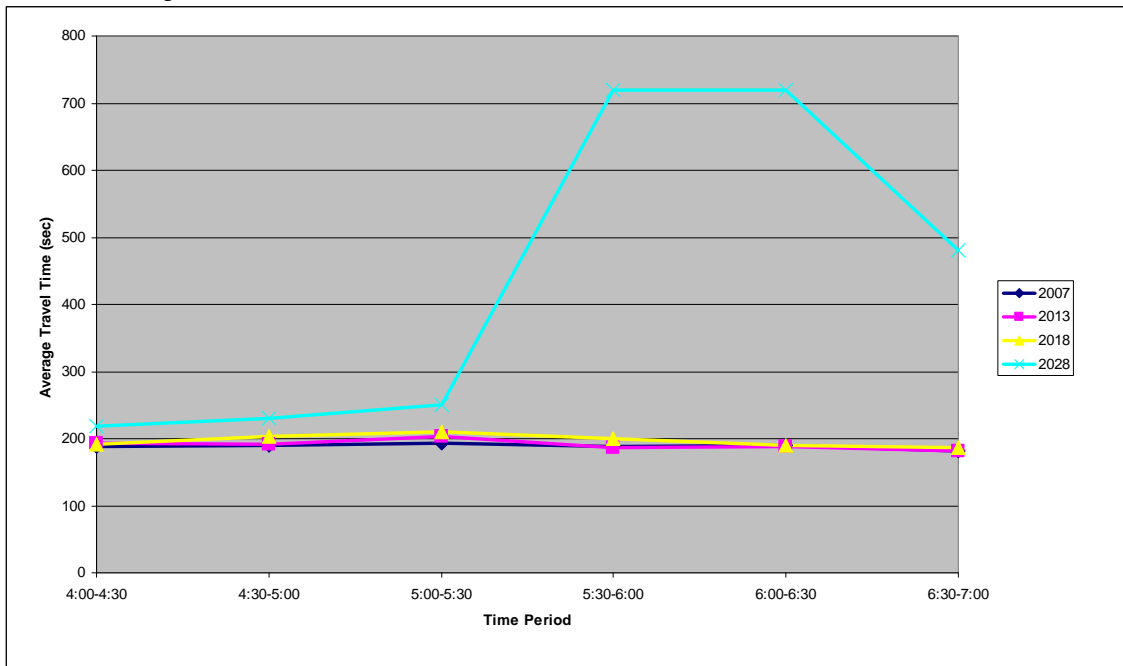


Figure 5-1 indicates that the northbound travel times currently peak between 8.30am and 9.30am. If traffic growth increases in future years a predicted, this peak is anticipated to become more intense and over a longer time period.

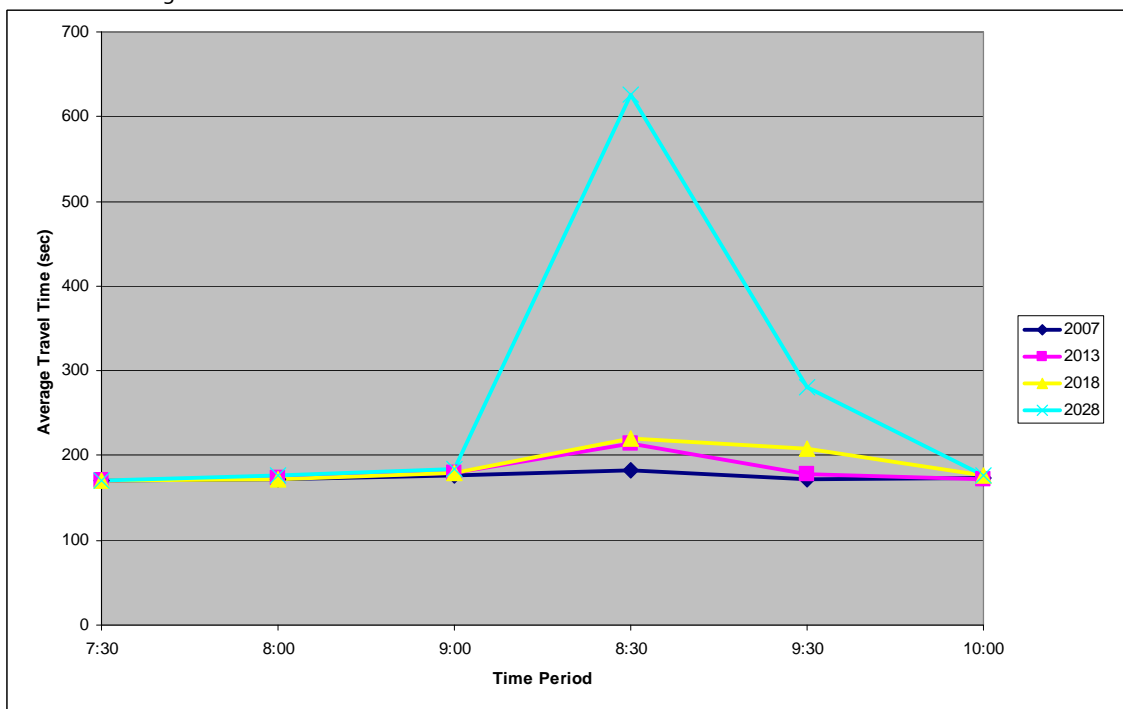
options testing

Figure 5.2: Bent Street Northbound (Gwydir Hwy to Villers Street) – PM Peak Average Travel Time Existing Road Network



The PM peak average travel times for the northbound direction are not likely to vary until 2028, which indicates that travel times could increase by more than 550 seconds.

Figure 5.3: Bent Street Southbound (Villers Street to Gwydir Hwy) – AM Peak Average Travel Time Existing Road Network



Similar to the northbound direction during the PM peak, the average travel times for the southbound direction are not likely to vary until the year 2028, indicating that the travel time is likely to increase by up to 450 seconds.

options testing

Figure 5.4: Bent Street Southbound (Villers Street to Gwydir Hwy) – PM Peak Average Travel Time Existing Road Network

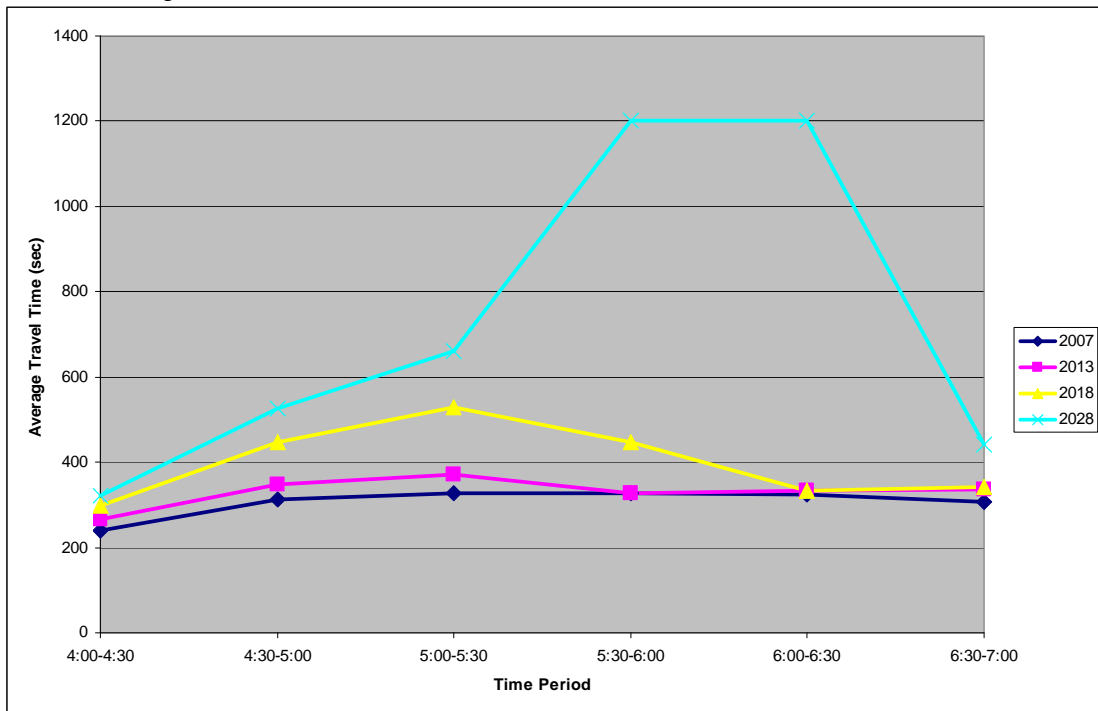


Figure 5.4 indicates that the southbound travel times during the PM peak are likely to increase in each design year and by 2028 travel times will be up to 20 minutes, six times greater than the off peak travel times recorded.

In addition to the existing conditions road network geometry, the travel time results for each of the options were recorded and are set out in Figures 5.5 – 5.8.

Figure 5.5: Bent Street Northbound (Gwydir Hwy to Villers Street) – AM Peak (8.30-9.30) Average Travel Time

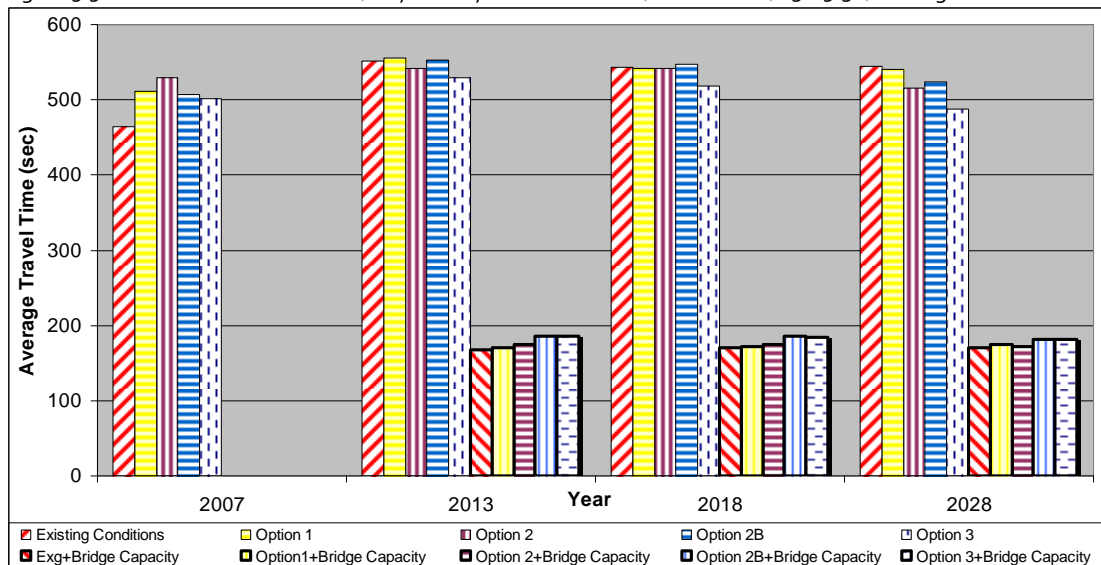


Figure 5.5 shows that the introduction of the additional bridge capacity will reduce northbound travel times by up to a third. Option 3 will provide the best average travel time beyond 2013 for the options without the bridge capacity.

options testing

Figure 5.6: Bent Street Northbound (Gwydir Hwy to Villers Street) – PM Peak (4.30-5.30) Average Travel Time

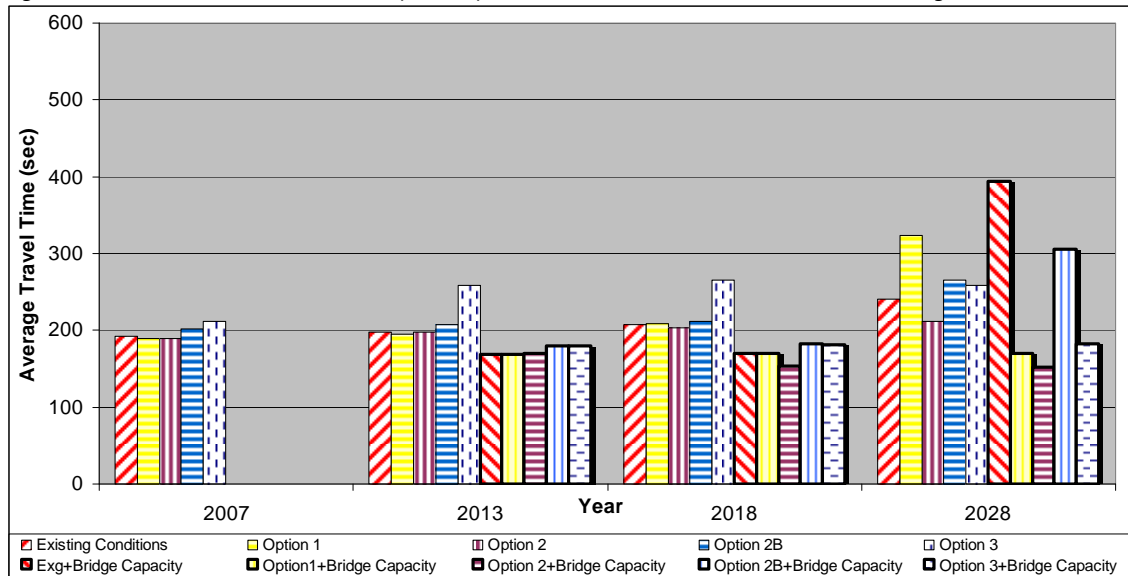


Figure 5.6 indicates that the introduction of additional capacity at the Grafton Bridge will provide marginal decreases in southbound travel times. The southbound movement can expect little variation in travel times prior to 2018, after which increases are anticipated.

Figure 5.7: Bent Street Southbound (Villers Street to Gwydir Hwy) – AM Peak (8.30-9.30) Average Travel Time

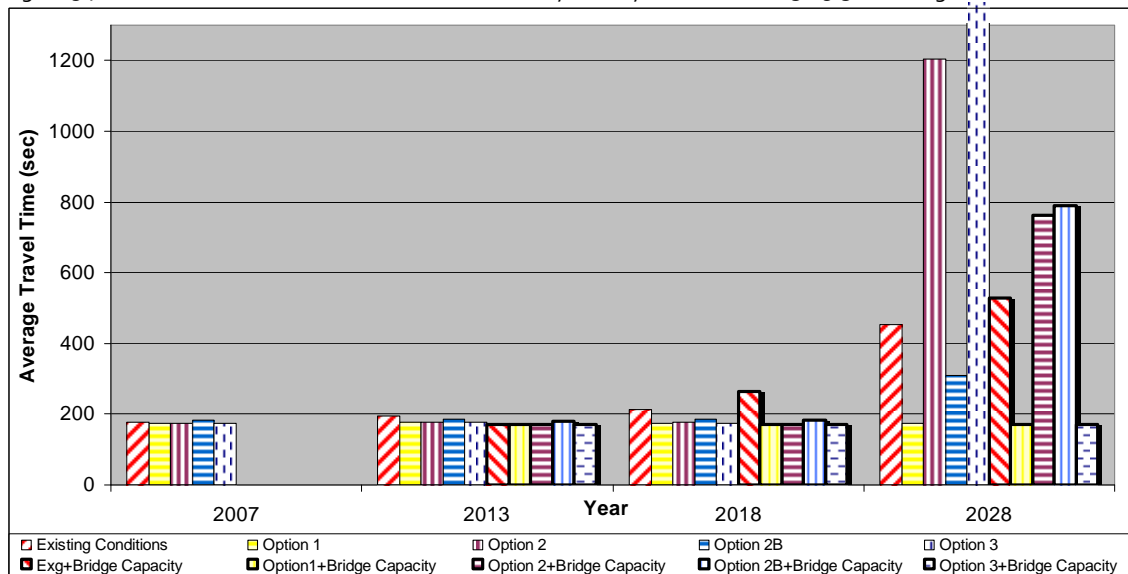


Figure 5.7 indicates that prior to 2018, each of the options will provide some improvement for the southbound movement, with and without the introduction of the additional bridge capacity. Each of the options are anticipated to experience congested conditions and increases in travel times by 2028.

Figure 5.8: Bent Street Southbound (Villers Street to Gwydir Hwy) – PM Peak (4.30-5.30) Average Travel Time

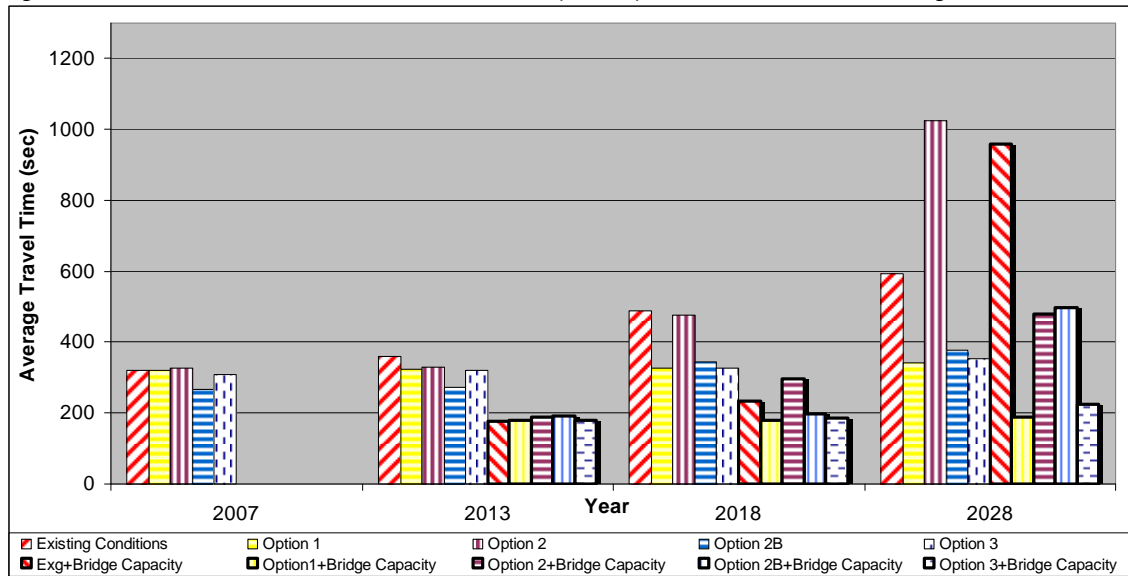


Figure 5.8 shows that prior to 2028, each of the options will provide lower travel times than the existing conditions. Option 3 presents on average, the shortest travel times for southbound Route 2 with and without the additional bridge capacity. The results for the year 2028 indicate that the network will reach congested conditions resulting in a large variation of travel time results.

The queue lengths for key approaches to intersections within the modelled area have also been extracted from the model and are shown in Table 5.4 – 5.6. Full results are located in Appendix G

Table 5.4: South Grafton Traffic Study - Queue Summary Gwydir Hwy / Bent Street AM Peak (PM Peak)

Options	95% Queue				
	Approach	2007	2013	2018	2028
Ex	Gwydir Hwy E App	16 (8)	32 (33)	33 (32)	32 (0)
	Bent Street N App	2 (6)	45 (44)	42 (46)	45 (16)
Ex+b*	Gwydir Hwy E App		31 (21)	27 (32)	31 (34)
	Bent Street N App		9 (6)	45 (44)	45 (44)
Option 1	Gwydir Hwy E App	3 (3)	4 (4)	4 (5)	6 (31)
	Bent Street N App	3 (4)	2 (5)	3 (9)	5 (43)
Option 1+b*	Gwydir Hwy E App		3 (3)	3 (7)	3 (24)
	Bent Street N App		4 (9)	3 (12)	3 (12)
Option 2	Gwydir Hwy E App	4 (4)	6 (5)	4 (31)	33 (3)
	Bent Street N App	4 (6)	5 (8)	4 (22)	46 (43)
Option 2+b*	Gwydir Hwy E App		4 (13)	4 (31)	1 (0)
	Bent Street N App		4 (15)	7 (45)	48 (45)
Option 2B	Gwydir Hwy E App	4 (4)	3 (7)	11 (14)	0 (2)
	Bent Street N App	3 (5)	3 (5)	5 (7)	11 (10)
Option 2B+b*	Gwydir Hwy E App		3 (4)	4 (13)	3 (9)
	Bent Street N App		3 (7)	5 (8)	11 (11)
Option 3	Gwydir Hwy E App	3 (4)	3 (14)	13 (15)	4 (15)
	Bent Street N App	4 (6)	5 (6)	3 (11)	3 (43)
Option 3+b*	Gwydir Hwy E App		6 (13)	3 (14)	3 (15)
	Bent Street N App		2 (11)	5 (47)	4 (45)

AM Peak: 8:30-9:30

PM peak: 16:30-17:30

* "b": Additional lane over Grafton Bridge to increase the capacity

Table 5.4 shows that the additional bridge capacity options will reduce queue lengths for the north approach to the Gwydir Highway / Bent Street intersection. In addition, the introduction of two through lanes in each direction on the Gwydir Highway will immediately reduce the levels of congestion between Bent Street and the Pacific Highway.

Table 5.5: South Grafton Traffic Study - Queue Summary Bent Street / Through Street AM Peak (PM Peak)

Options	95% Queue				
	Approach	2007	2013	2018	2028
Ex	Through St W App	54 (2)	57 (3)	56 (10)	56 (45)
	Bent Street S App	57 (5)	58 (4)	59 (5)	60 (58)
Ex+b*	Through St W App		7 (4)	8 (6)	13 (13)
	Bent Street S App		7 (4)	5 (4)	7 (60)
Option 1	Through St W App	46 (3)	56 (3)	56 (11)	55 (8)
	Bent Street S App	58 (4)	58 (6)	60 (5)	59 (25)
Option 1+b*	Through St W App		3 (3)	6 (4)	42 (6)
	Bent Street S App		10 (5)	8 (5)	7 (7)
Option 2	Through St W App	52 (3)	57 (5)	58 (9)	45 (44)
	Bent Street S App	58 (4)	61 (4)	60 (6)	21 (24)
Option 2+b*	Through St W App		3 (4)	6 (12)	44 (40)
	Bent Street S App		6 (4)	7 (7)	20 (13)
Option 2B	Through St W App	54 (2)	56 (4)	58 (9)	56 (45)
	Bent Street S App	47 (4)	51 (5)	48 (7)	32 (6)
Option 2B+b*	Through St W App		8 (2)	5 (12)	40 (44)
	Bent Street S App		6 (5)	9 (4)	7 (2)
Option 3	Through St W App	52 (2)	57 (4)	56 (8)	56 (41)
	Bent Street S App	61 (6)	58 (4)	56 (7)	58 (32)
Option 3+b*	Through St W App		9 (4)	12 (38)	25 (40)
	Bent Street S App		8 (4)	9 (6)	4 (29)

AM Peak: 8:30-9:30

PM peak: 16:30-17:30

* "b": Additional lane over Grafton Bridge to increase the capacity

Table 5.5 shows that the Bent Street / Through Street roundabout will experience significantly reduced queue lengths in each of the additional bridge capacity options. The queue lengths do not reduce for any of the options which is due to the rolling queue that results from the 'bottleneck' and the bridge.

Table 5.6: South Grafton Traffic Study - Queue Summary Pacific Highway / Gwydir Highway AM Peak (PM Peak)

Options	95% Queue				
	Approach	2007	2013	2018	2028
Ex	Gwydir Highway W App	8 (3)	35 (32)	34 (36)	34 (21)
	Pacific Highway N App RT	2 (0)	25 (22)	27 (24)	23 (6)
Ex+b*	Gwydir Highway W App		33 (3)	34 (34)	35 (32)
	Pacific Highway N App RT		10 (1)	6 (11)	16 (24)
1	Gwydir Highway W App	2 (2)	3 (3)	3 (4)	3 (29)
	Pacific Highway N App RT	2 (0)	1 (1)	1 (2)	2 (25)
1+b*	Gwydir Highway W App		3 (3)	2 (3)	16 (7)
	Pacific Highway N App RT		1 (1)	0 (2)	2 (4)
2	Gwydir Highway W App	3 (4)	4 (3)	14 (28)	26 (23)
	Pacific Highway N App RT	6 (3)	12 (7)	12 (20)	26 (21)
2+b*	Gwydir Highway W App		3 (25)	8 (31)	34 (34)
	Pacific Highway N App RT		9 (8)	11 (21)	25 (10)
2B	Gwydir Highway W App	3 (5)	3 (5)	4 (8)	31 (30)
	Pacific Highway N App RT	9 (5)	9 (7)	7 (8)	22 (21)
2B+b*	Gwydir Highway W App		5 (7)	4 (9)	27 (27)
	Pacific Highway N App RT		7 (6)	8 (10)	13 (22)
3	Gwydir Hwy W App	1 (2)	0 (2)	0 (3)	1 (3)
3+b*	Gwydir Hwy W App		1 (2)	5 (2)	2 (5)

AM Peak: 8:30-9:30

PM peak: 16:30-17:30

* "b": Additional lane over Grafton Bridge to increase the capacity

Table 5.6 shows that the introduction of two through lanes on Charles Street (Option 1) will provide reduced queue lengths for both the Pacific Highway right turn into the Gwydir Highway and the Gwydir Highway approach to the Pacific Highway. In addition, Option 3 (Bigabout Option) is expected to experience the shortest queue lengths on the west approach to the Pacific Highway in each of the options and design years.

5.3 Development Traffic Contribution

In addition to the model outputs set out in the previous sections, the contribution that each of the developments (refer to Section 4) can be deduced by comparing to the total traffic demand in each of the nominated design years. Table 5.7 shows the proportion of traffic that the planned developments are likely to have within South Grafton.

Table 5.7: South Grafton Traffic Study – Development Traffic Proportion of completed trips

Year	Area	PM Peak Hour Trips	PM Peak Travel Demand*	Proportion of total completed trips
2013	A – South Grafton Retail	50	5172	1.0%
	B – South Grafton Retail	18		0.4%
	C – South Grafton Industrial	75		0.2%
	D – Clarenza Development	235		1.5%
	E – Balwalla Heights	128		4.5%
	Total	506		9.8%
2018	A – South Grafton Retail	100	5796	1.7%
	B – South Grafton Retail	72		1.2%
	C – South Grafton Industrial	250		4.3%
	D – Clarenza Development	372		6.4%
	E – Balwalla Heights	255		4.4%
	Total	1049		18.1%
2028	A – South Grafton Retail	200	6751	3.0%
	B – South Grafton Retail	144		2.1%
	C – South Grafton Industrial	350		5.2%
	D – Clarenza Development	639		9.5%
	E – Balwalla Heights	510		7.6%
	Total	1843		27.3%

* Travel demand for the PM peak hour Network including development traffic

Table 5.7 indicates that by 2018, the anticipated developments are likely to generate up to 27.3% of the total traffic demand in the South Grafton area, of which 9.5% can be attributed to the Clarenza Development.

6. Conclusion

The microsimulation modelling indicates that under existing traffic conditions, travel times and queuing will progressively increase and the network will become more vulnerable to blockages or grid lock caused the additional traffic demand.

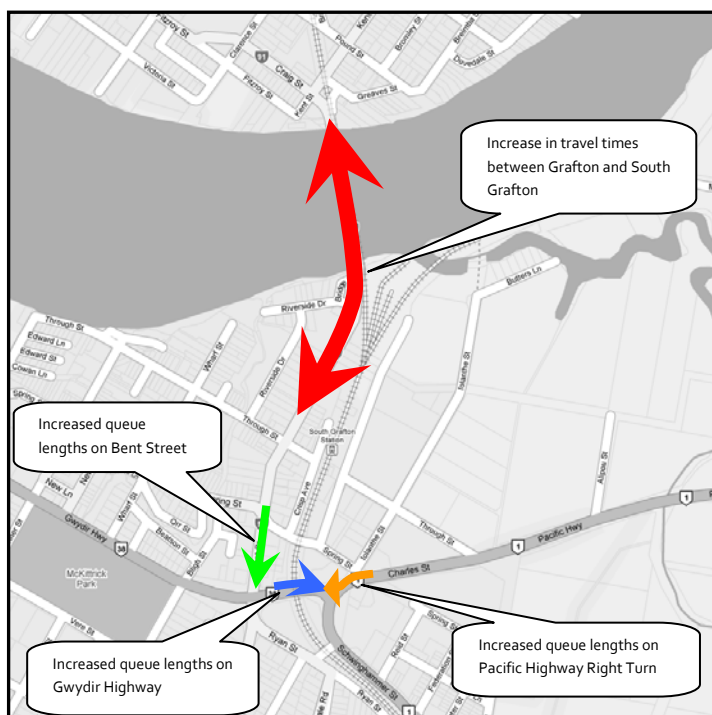
The Grafton Bridge 'bottle neck' results in congested conditions within South Grafton during the AM peak period which adds complexity to the assessment of the various options. For example, the northbound travel times in each option and design year up to 2028 are likely to vary by less than 25 seconds (five percent). However, the duration of the peak is likely to occur for a longer period, as shown graphically in Section 5.2.1.

Based on the assumptions of land use and general traffic growth set out in Section 4, the following outcomes can be expected in the network from 2013 and beyond:

- Increased travel times for vehicles both arriving to and coming from the Grafton township;
- Increased queue lengths on the north approach to the Bent Street / Gwydir Highway Intersection in both the AM and PM peak periods;
- Increased queue lengths on the Gwydir Highway approach to the Pacific Highway intersection in both the AM and PM peak periods; and
- Increase in queue lengths on the Pacific Highway right turn into Gwydir Highway during both the AM and PM peak periods.

The outcomes are shown graphically in Figure 6.1.

Figure 6.1: South Grafton Traffic Study - Anticipated Traffic Outcomes



conclusion

The options defined in Section 5 have been developed in consultation with the RTA and CVC. Each of the options were developed and aimed at managing the traffic issues in South Grafton. The Q-Paramics model was able to assess each option and determine its effectiveness. Based on the modelling results, the following comments are provided:

- The introduction of two traffic lanes in each direction on Charles Street (Option 1) will provide immediate benefit and will reduce queue lengths on the Gwydir Highway eastern approach to Bent Street. This will provide reduced queue lengths on the east approach to the Bent Street / Gwydir Highway prior to 2028;
- The introduction of a signalised intersection (Option 2) at the intersection of Pacific Highway / Iolanthe Street / Spring Street is not warranted on traffic grounds prior to 2018. The introduction of traffic signals may however provide added safety benefits;
- The proposed Spring Street / Bent Street roundabout (Option 2B) will add flexibility in facilitating the movement of traffic through south Grafton. By 2018, the introduction of the roundabout will reduce the southbound travel times by up to 25 percent;
- The network is anticipated to reach saturating levels of congestion by 2028 should the anticipated developments reach the forecast levels; and
- The introduction of an additional bridge in Grafton will improve the operating conditions of the network, reducing the northbound travel times by up to five minutes.

In summary, the network improvement options assessed (excluding increased Bridge capacity) will provide marginal benefits to the operating performance of the network, predominantly due to the constraints experienced at the Grafton Bridge. The additional bridge capacity will reduce AM peak period travel times by less than 50% for the northbound movement.

Based on the analysis and discussion presented in this report, the following conclusions are provided:

- i Option 1, which is the introduction of two through lanes on Charles Street between the Pacific Highway and Bent Street, is recommended to be implemented immediately to improve the operating conditions on the Gwydir Highway between the Pacific Highway and Bent Street;
- ii Based on traffic grounds, the signalised intersection at Pacific Highway / Iolanthe Street / Spring Street (Option 2) will not provide any benefit prior to 2018, however further investigation may be required to assess its safety benefits;
- iii The introduction of a roundabout controlled intersection (Option 2B) with the signalised Pacific Highway / Iolanthe Street / Spring Street intersection, will provide reduced travel times from 2018;
- iv Further investigation (i.e. a transport land use model) may be required to accurately forecast the 2028 traffic demands and movements within South Grafton and Grafton; and
- v The introduction of an additional river crossing of the Grafton River significantly improves the operating conditions of the network within South Grafton.

Although outside of the scope of this Study, the overall increased congestion and queuing in the network has potential to have to have adverse safety consequences especially as the network's congestion increasingly impacts at its interface with the Pacific Highway.

Appendix A



appendix a

AM and PM Turning Movement Counts

appendix

Note: The numbers in brackets indicate pm peak volumes and the numbers without brackets are am peak volumes.

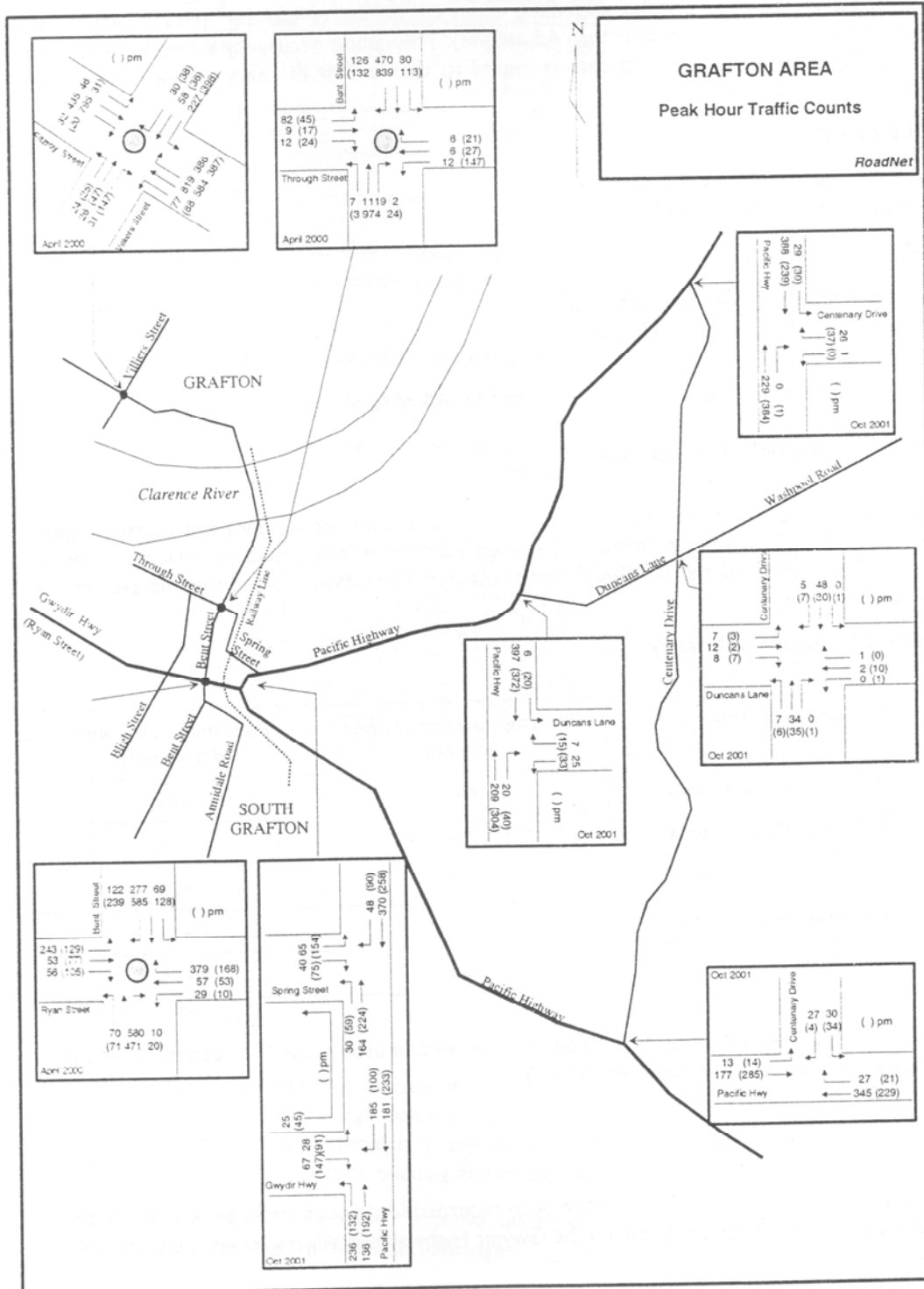


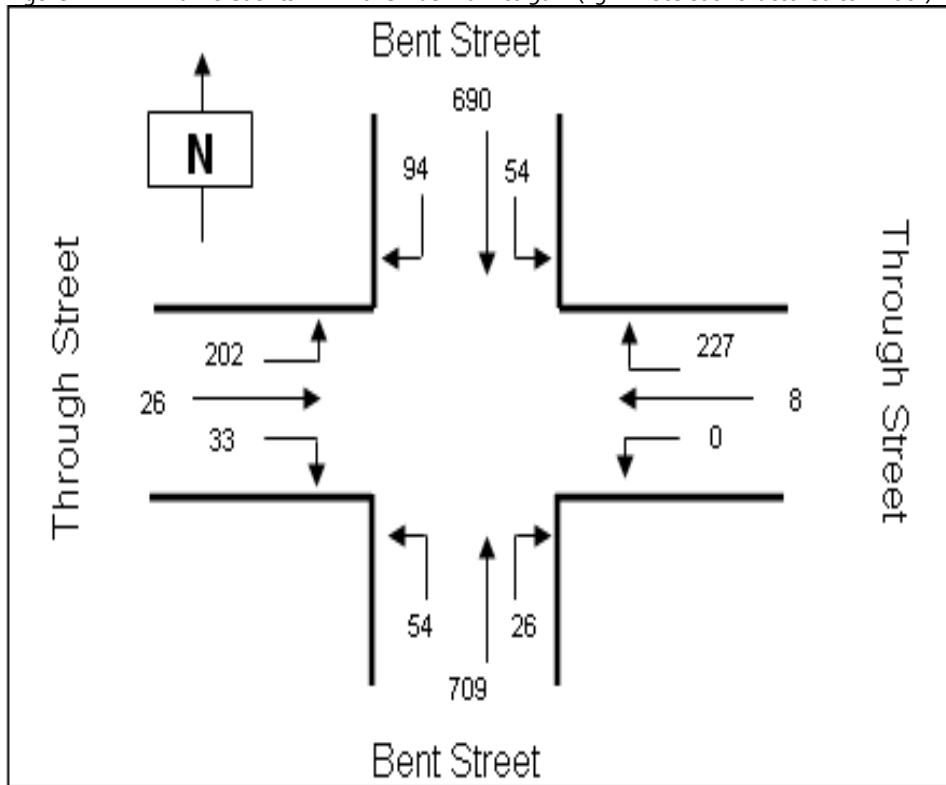
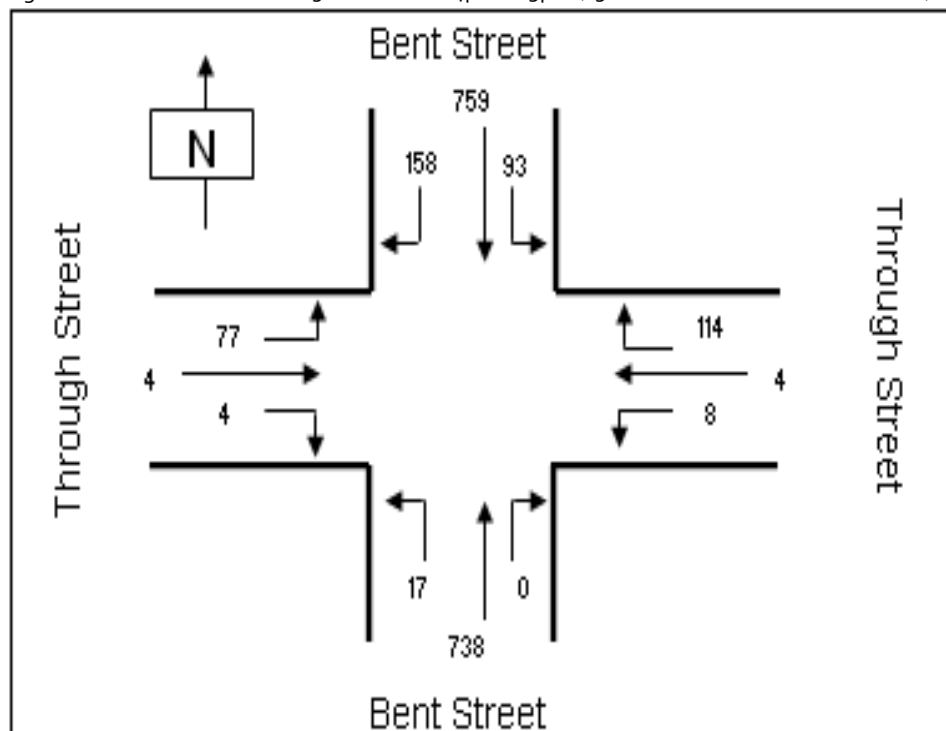
Figure F1 – AM Traffic Counts 16th November 8am to 9am (15 minute count factored to 1 hour)

 Figure F2 – PM Traffic Counts 15th November 4pm to 5pm (15 minute count factored to 1 hour)


Figure F3 – AM Traffic Counts 16th November 8am to 9am

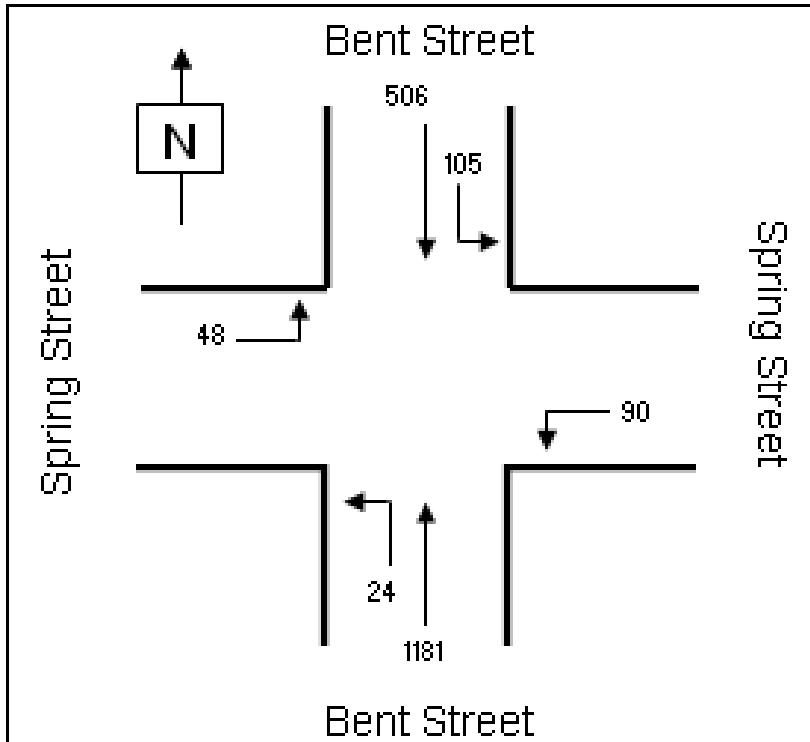


Figure F4 – PM Traffic Counts 15th November 4pm to 5pm

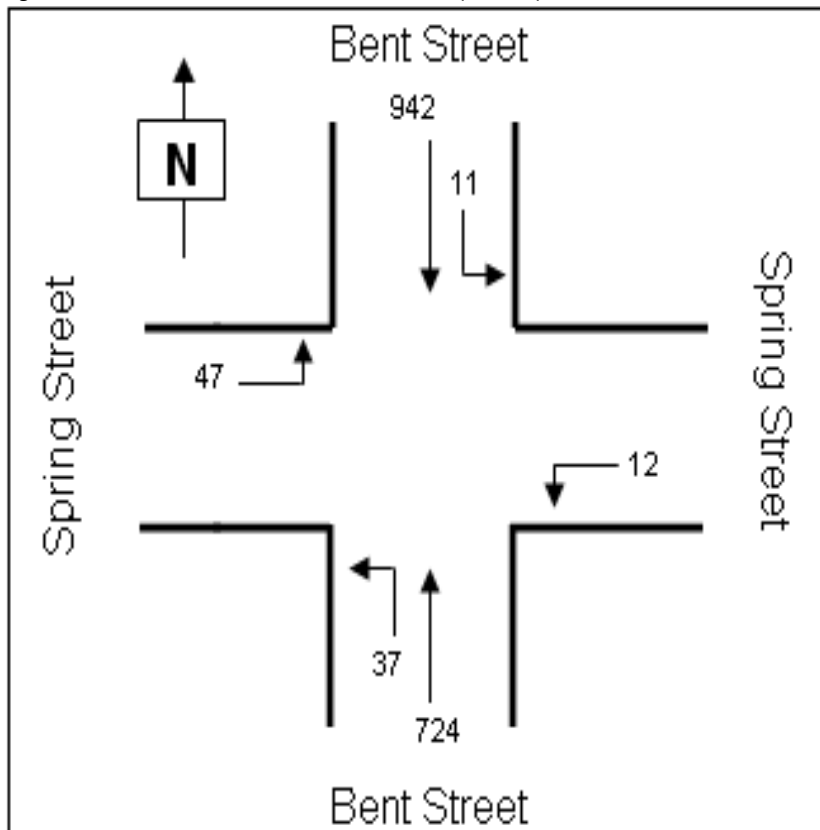


Figure F5 – AM Traffic Counts 16th November 8am to 9am

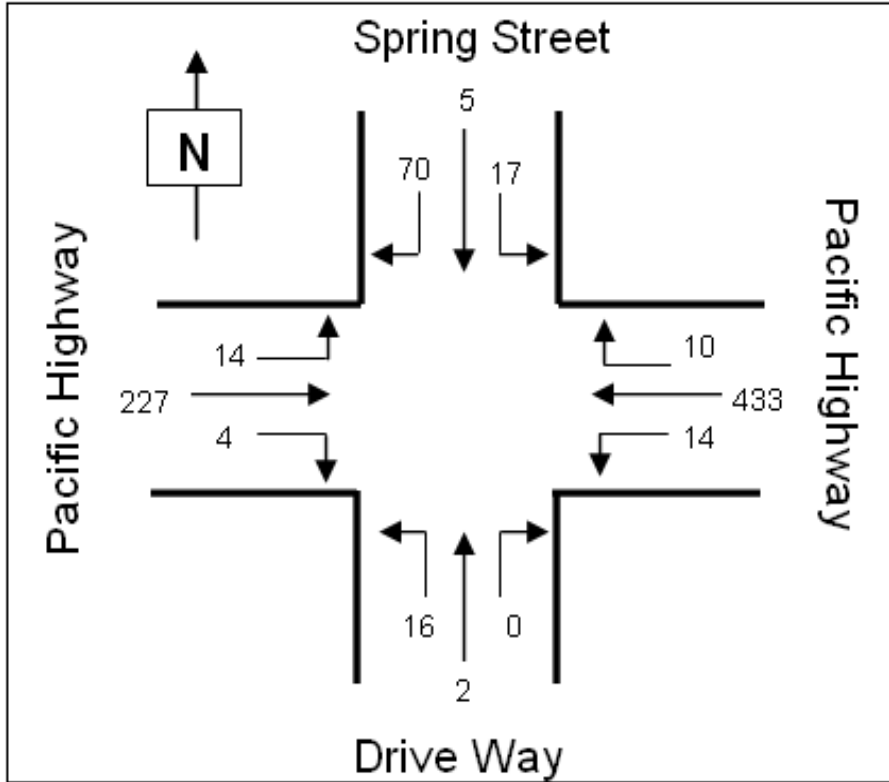


Figure F6 – PM Traffic Counts 15th November 4pm to 5pm

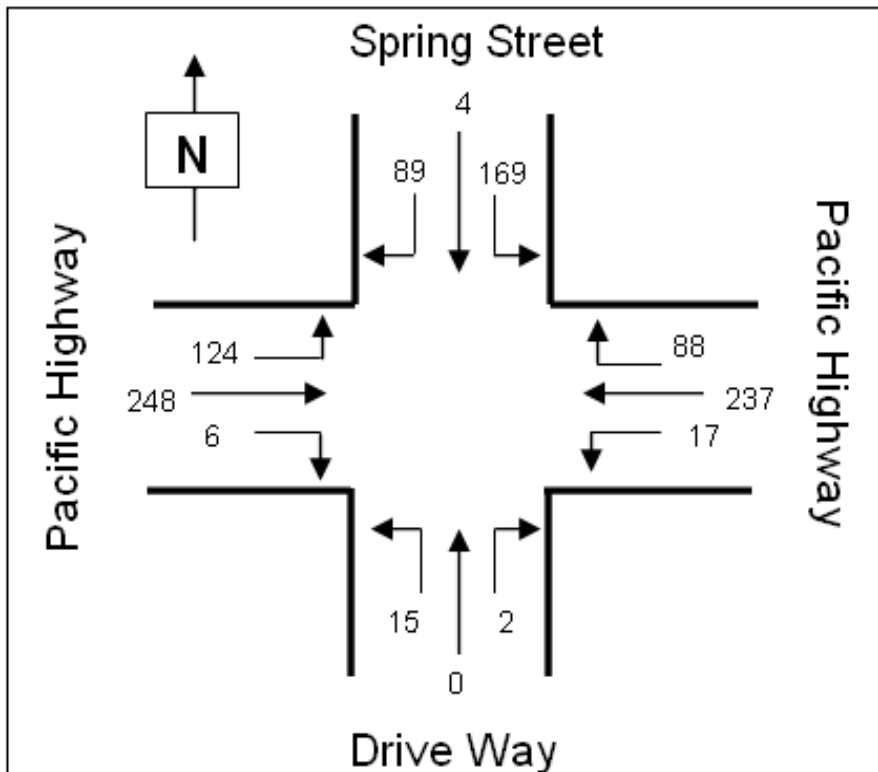


Figure F7 – AM Traffic Counts 16th November 8am to 9am

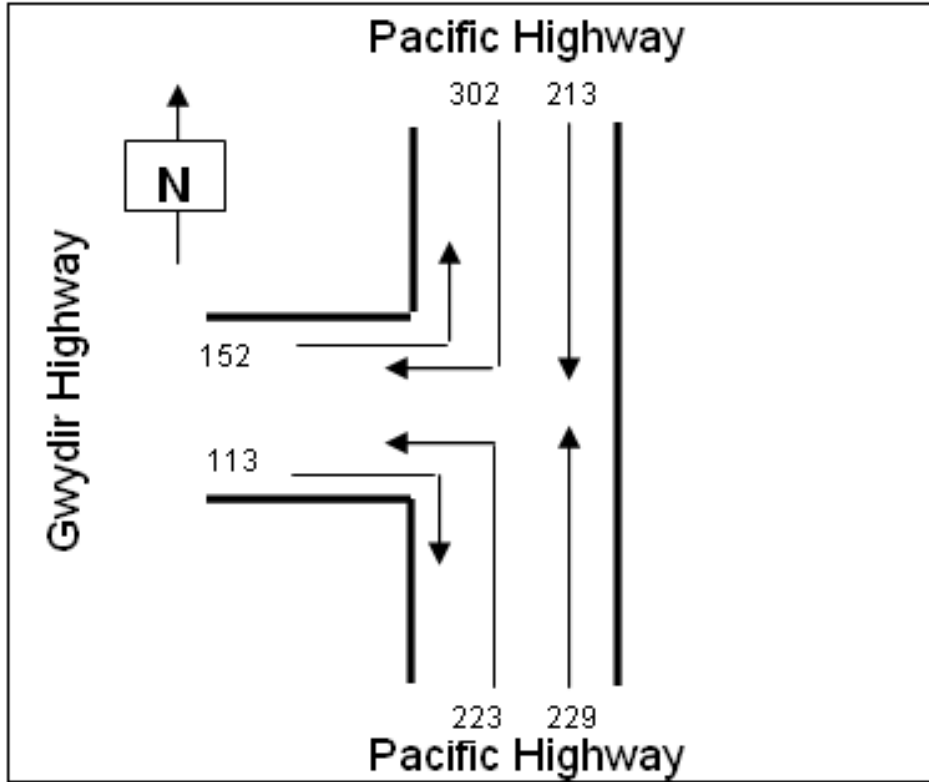


Figure F8 – PM Traffic Counts 15th November 4pm to 5pm

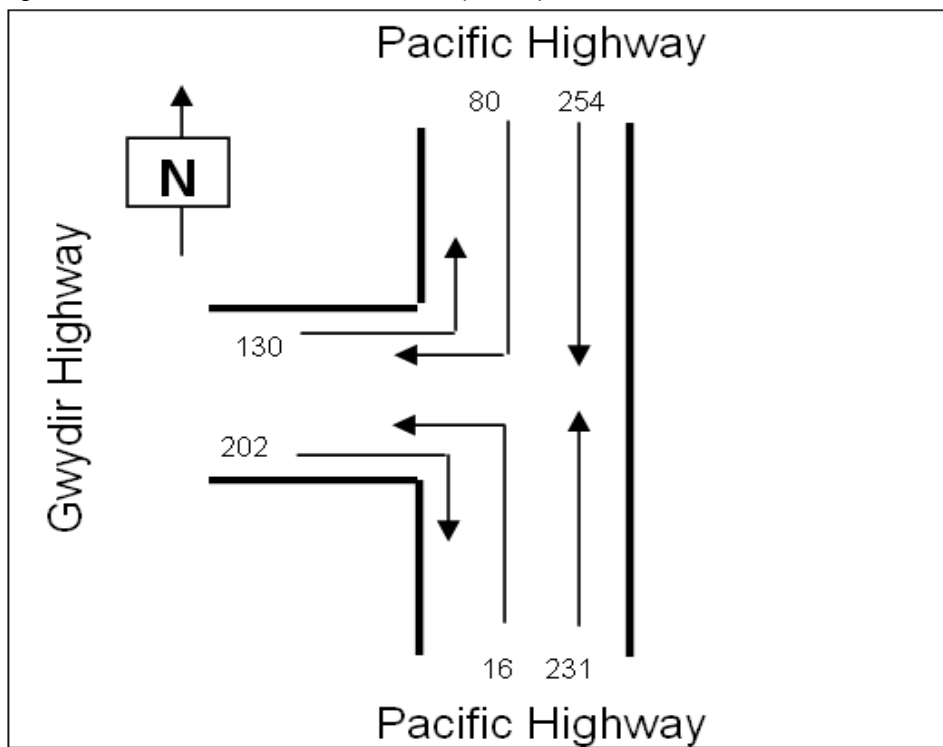


Figure F9 – AM Traffic Counts 16th November 8am to 9am

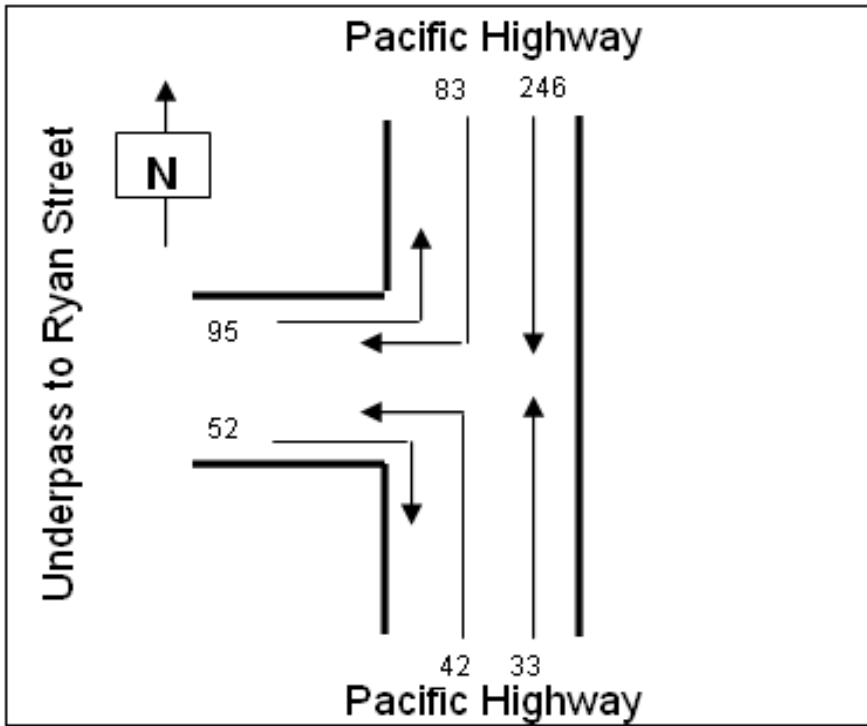


Figure F10 – PM Traffic Counts 15th November 4pm to 5pm

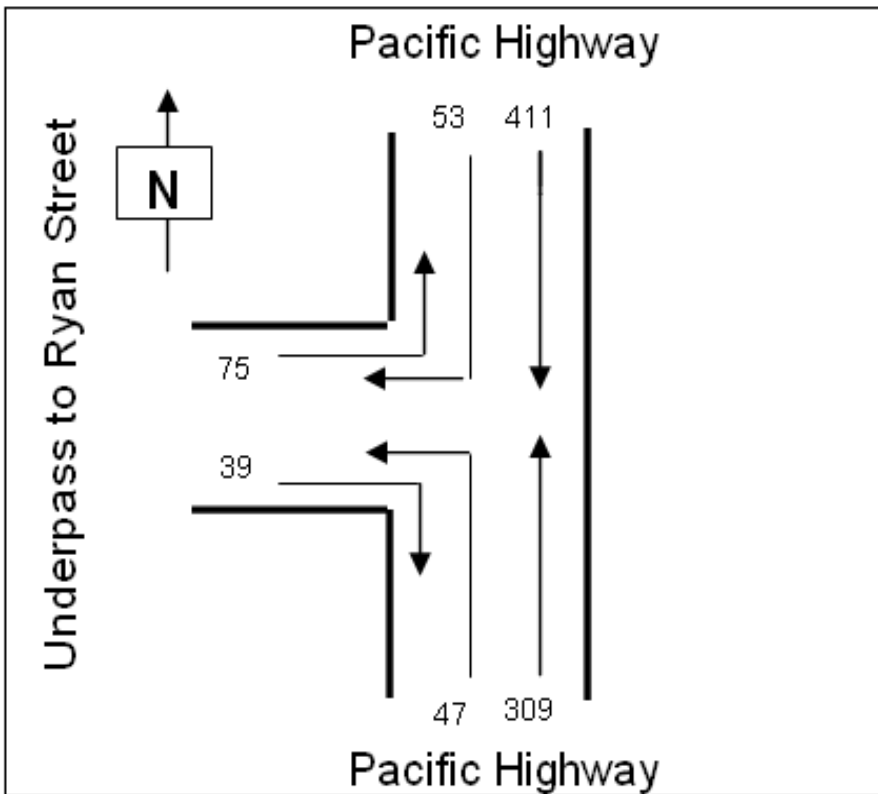


Figure F11 – AM Traffic Counts 16th November 8am to 9am

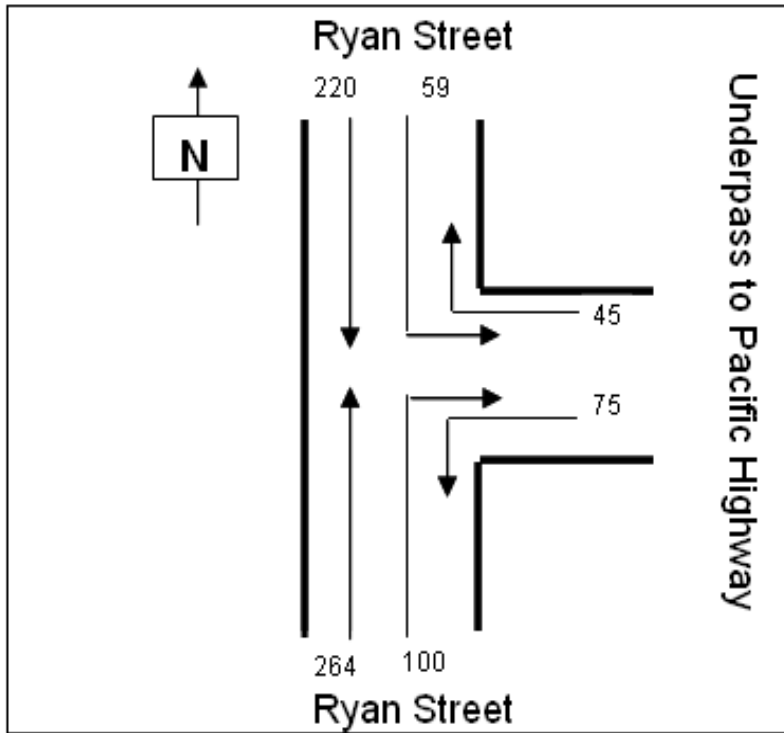


Figure F12 – PM Traffic Counts 15th November 4pm to 5pm

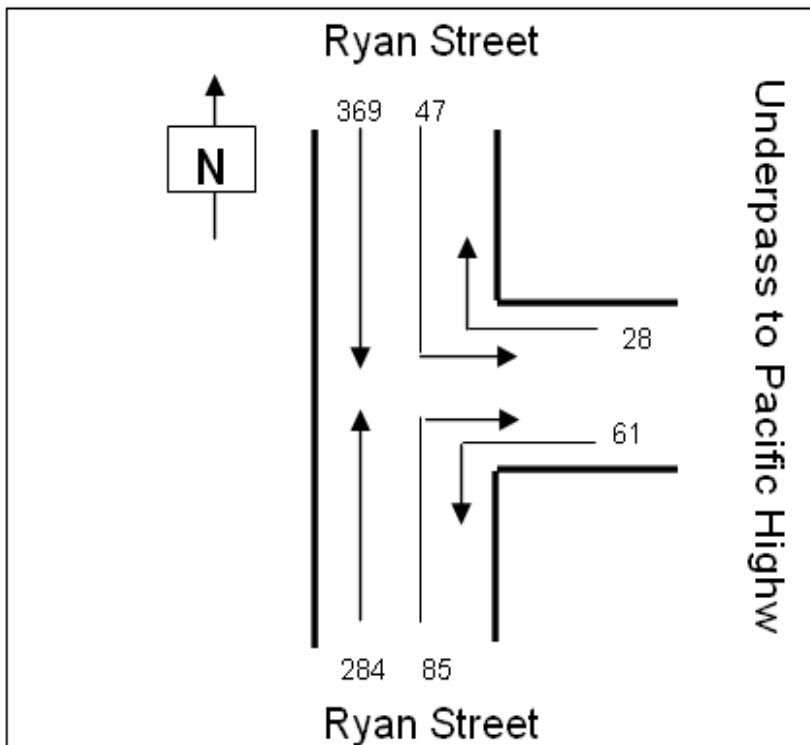


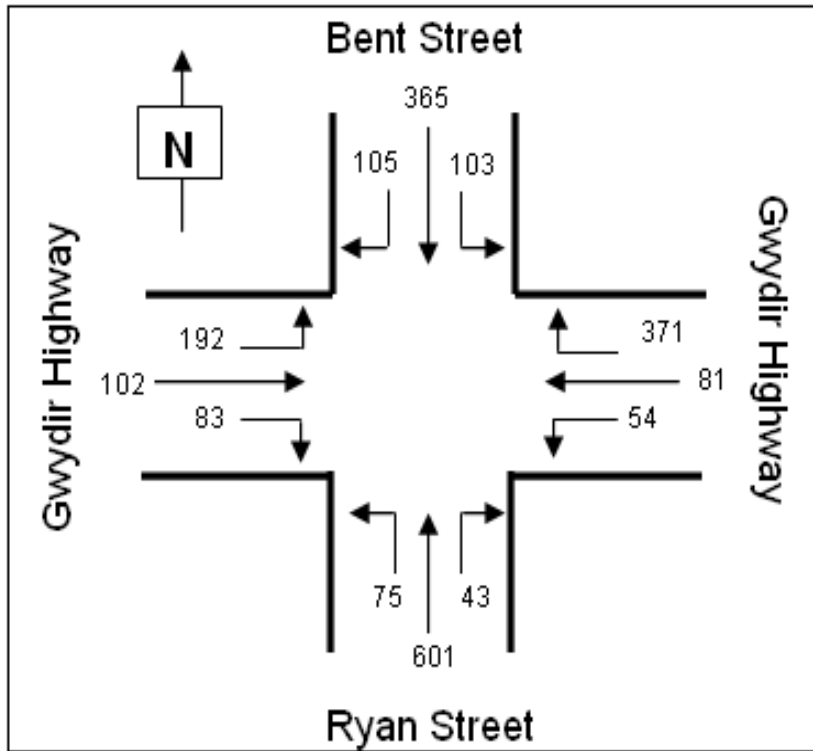
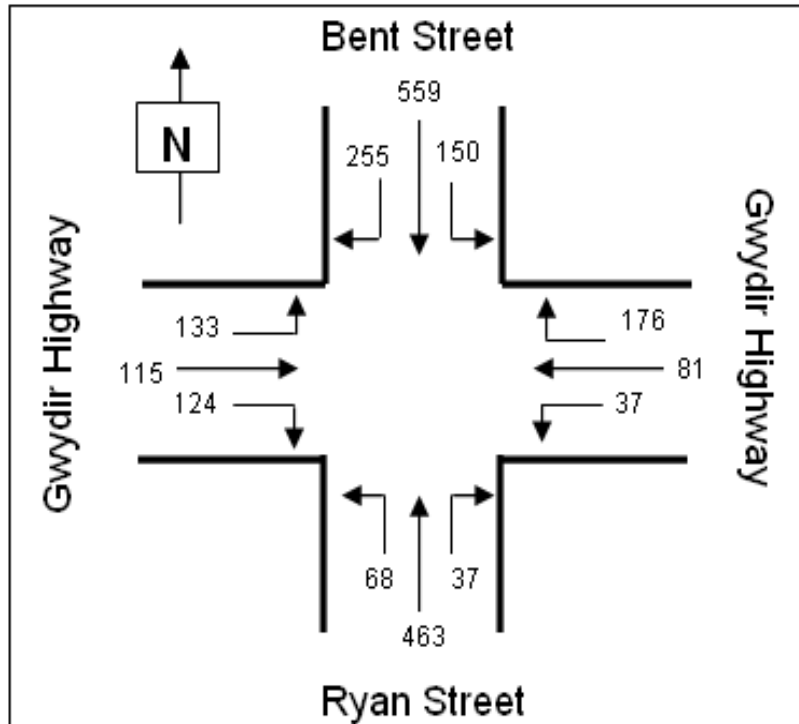
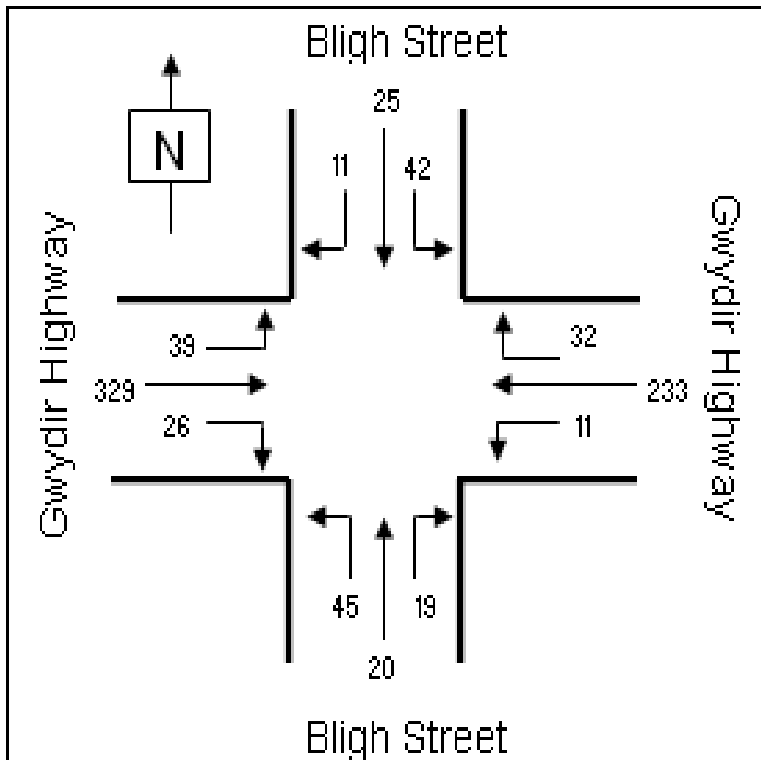
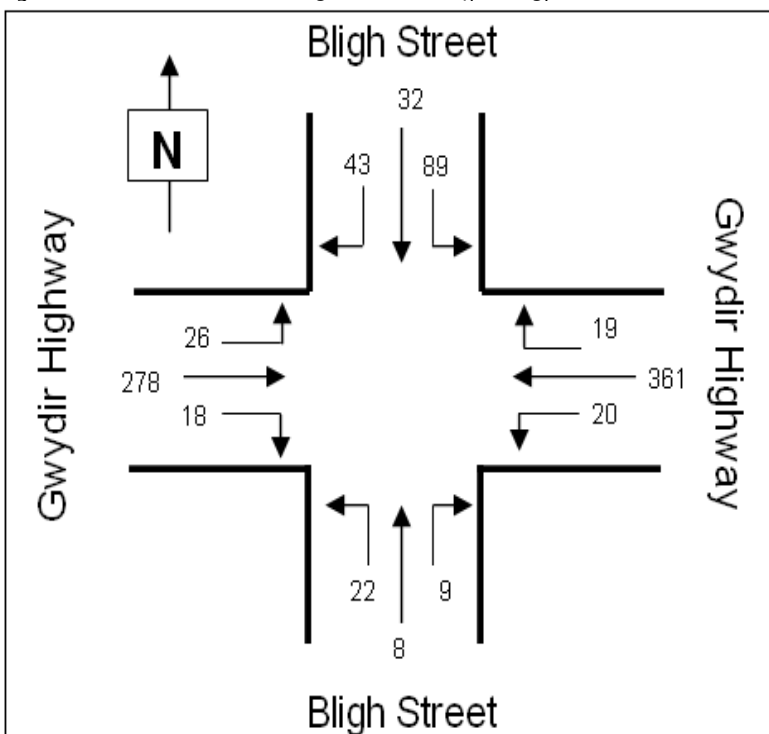
Figure F13 – AM Traffic Counts 16th November 8am to 9am

 Figure F14 – PM Traffic Counts 15th November 4pm to 5pm


Figure F15 – AM Traffic Counts 16th November 8am to 9am

 Figure F16 – PM Traffic Counts 15th November 4pm to 5pm


Appendix B

Existing Conditions Network Model – Calibration Summary



appendix b

AM Turn Flow Results

Location AM Intervals	Observed			Modelled			GEH			Actual Difference			Percentage Difference		
	7-8	8-9	9-10	7-8	8-9	9-10	7-8	8-9	9-10	7-8	8-9	9-10	7-8	8-9	9-10
Spring Street (W) to Bent Street (N)	21	48	55	12.4	25.8	22	2.10	3.65	5.32	-8.6	-22.2	-33	-41.0	-46.3	-60.0
Bent Street (S) to Spring Street (W)	12	24	31	65.2	51.4	55.6	8.56	4.46	3.74	53.2	27.4	24.6	443.3	114.2	79.4
Bent Street (S) to Bent Street (N)	629	1181	817	685	1219	963.4	2.18	1.10	4.91	56	38	146.4	8.9	3.2	17.9
Bent Street (N) to Spring Street (S)	329	506	500	422.8	647	570.6	4.84	5.87	3.05	93.8	141	70.6	28.5	27.9	14.1
Bent Street (N) to Bent Street (E)	88	105	80	76.4	117.2	91.2	1.28	1.16	1.21	-11.6	12.2	11.2	-13.2	11.6	14.0
Spring Street (E) to Bent Street (S)	37	90	81	43.2	79.4	47.4	0.98	1.15	4.19	6.2	-10.6	-33.6	16.8	-11.8	-41.5
Gwydir Hwy (W) to Bligh Street (N)	14	39	9	6	9.6	5.6	2.53	5.96	1.26	-8	-29.4	-3.4	-57.1	-75.4	-37.8
Gwydir Hwy (W) to Gwydir Hwy (E)	224	329	300	259	337.2	288.4	2.25	0.45	0.68	35	8.2	-11.6	15.6	2.5	-3.9
Gwydir Hwy (W) to Bligh Street (S)	13	26	35	15	23	15	0.53	0.61	4.00	2	-3	-20	15.4	-11.5	-57.1
Bligh Street (S) to Gwydir Hwy (W)	11	45	19	24.2	45	23.6	3.15	0.00	1.00	13.2	0	4.6	120.0	0.0	24.2
Bligh Street (S) to Bligh Street (N)	8	20	13	10.6	16.2	10.6	0.85	0.89	0.70	2.6	-3.8	-2.4	32.5	-19.0	-18.5
Bligh Street (S) to Gwydir Hwy (E)	4	19	8	10.8	21	11.4	2.50	0.45	1.09	6.8	2	3.4	170.0	10.5	42.5
Gwydir Hwy (E) to Bligh Street (S)	8	11	15	11.6	8.4	25.4	1.15	0.83	2.31	3.6	-2.6	10.4	45.0	-23.6	69.3
Gwydir Hwy (E) to Gwydir Hwy (W)	119	233	247	135.4	307.2	204.6	1.45	4.51	2.82	16.4	74.2	-42.4	13.8	31.8	-17.2
Gwydir Hwy (E) to Bligh Street (N)	10	32	22	7	13.4	3	1.03	3.90	5.37	-3	-18.6	-19	-30.0	-58.1	-86.4
Bligh Street (N) to Gwydir Street (E)	23	42	52	8.4	29.8	10.8	3.68	2.04	7.35	-14.6	-12.2	-41.2	-63.5	-29.0	-79.2
Bligh Street (N) to Bligh Street (S)	12	25	22	6.6	21	5.2	1.77	0.83	4.56	-5.4	-4	-16.8	-45.0	-16.0	-76.4
Bligh Street (N) to Gwydir Street (W)	13	11	13	25.8	0.8	23.8	2.91	4.20	2.52	12.8	-10.2	10.8	98.5	-92.7	83.1
Ryan Street (W) to Underpass (N)	29	59	42	15.8	30.6	17.6	2.79	4.24	4.47	-13.2	-28.4	-24.4	-45.5	-48.1	-58.1
Ryan Street (W) to Ryan Street (E)	178	220	232	164.2	201.4	177.8	1.06	1.28	3.79	-13.8	-18.6	-54.2	-7.8	-8.5	-23.4
Ryan Street (E) to Ryan Street (W)	221	264	281	204.6	260.2	221.4	1.12	0.23	3.76	-16.4	-3.8	-59.6	-7.4	-1.4	-21.2
Ryan Street (E) to Underpass (N)	65	100	80	97.2	170.2	117.8	3.58	6.04	3.80	32.2	70.2	37.8	49.5	70.2	47.3
Underpass (N) to Ryan Street (E)	46	75	49	41.6	85.6	50.4	0.66	1.18	0.20	-4.4	10.6	1.4	-9.6	14.1	2.9
Underpass (N) to Ryan Street (W)	16	45	17	32.4	38	27.8	3.33	1.09	2.28	16.4	-7	10.8	102.5	-15.6	63.5
Underpass (S) to Pacific Hwy (E)	24	52	46	14.4	57.6	30.8	2.19	0.76	2.45	-9.6	5.6	-15.2	-40.0	10.8	-33.0
Underpass (S) to Pacific Hwy (W)	55	95	50	110.8	161.8	114.6	6.13	5.90	7.12	55.8	66.8	64.6	101.5	70.3	129.2
Pacific Hwy (E) to Underpass (S)	31	42	33	40.4	59.4	37.6	1.57	2.44	0.77	9.4	17.4	4.6	30.3	41.4	13.9
Pacific Hwy (E) to Pacific Hwy (W)	299	332	318	272.6	375.8	303.8	1.56	2.33	0.81	-26.4	43.8	-14.2	-8.8	13.2	-4.5
Pacific Hwy (W) to Pacific Hwy (E)	185	246	312	177.4	265	310.2	0.56	1.19	0.10	-7.6	19	-1.8	-4.1	7.7	-0.6
Pacific Hwy (W) to Underpass (S)	42	83	47	41	73.6	48.2	0.16	1.06	0.17	-1	-9.4	1.2	-2.4	-11.3	2.6
Pacific Hwy (W) to Spring Street (N)	118	146	142	96.2	117.8	98.2	2.11	2.46	4.00	-21.8	-28.2	-43.8	-18.5	-19.3	-30.8
Pacific Hwy (W) to Pacific Hwy (E)	159	227	190	214.4	318.4	255	4.05	5.53	4.36	55.4	91.4	65	34.8	40.3	34.2
Pacific Hwy (E) to Pacific Hwy (W)	141	108	182	150	77.2	136	0.75	3.20	3.65	9	-30.8	-46	6.4	-28.5	-25.3
Spring Street (N) to Pacific Hwy (E)	96	171	102	71.2	105.2	68	2.71	5.60	3.69	-24.8	-65.8	-34	-25.8	-38.5	-33.3
Spring Street (N) to Pacific Hwy (W)	33	70	50	11	30.4	26.6	4.69	5.59	3.78	-22	-39.6	-23.4	-66.7	-56.6	-46.8
Gwydir Hwy (W) to Pacific Hwy (N)	97	152	145	119.2	185.8	113.4	2.14	2.60	2.78	22.2	33.8	-31.6	22.9	22.2	-21.8

appendix

Spring Street (N) to Pacific Hwy (W)	33	70	50	11	30.4	26.6	4.69	5.59	3.78	-22	-39.6	-23.4	-66.7	-56.6	-46.8
Gwydir Hwy (W) to Pacific Hwy (N)	97	152	145	119.2	185.8	113.4	2.14	2.60	2.78	22.2	33.8	-31.6	22.9	22.2	-21.8
Gwydir Hwy (W) to Pacific Hwy (S)	98	113	155	93.6	139.4	158.2	0.46	2.35	0.26	-4.4	26.4	3.2	-4.5	23.4	2.1
Pacific Hwy (S) to Gwydir Hwy (W)	173	223	187	200	299.6	188.6	1.98	4.74	0.12	27	76.6	1.6	15.6	34.3	0.9
Pacific Hwy (S) to Pacific Hwy (N)	189	229	212	192.2	250.4	239.2	0.23	1.38	1.81	3.2	21.4	27.2	1.7	9.3	12.8
Pacific Hwy (N) to Gwydir Hwy (W)	82	302	110	123.6	346.4	174	4.10	2.47	5.37	41.6	44.4	64	50.7	14.7	58.2
Pacific Hwy (N) to Pacific Hwy (S)	128	213	203	125.2	199.6	201.2	0.25	0.93	0.13	-2.8	-13.4	-1.8	-2.2	-6.3	-0.9
Through Street (W) to Bent Street (N)	115	202	161	123	128.2	121.4	0.73	5.74	3.33	8	-73.8	-39.6	7.0	-36.5	-24.6
Through Street (W) to Through Street (E)	15	26	22	12	7.8	17.4	0.82	4.43	1.04	-3	-18.2	-4.6	-20.0	-70.0	-20.9
Through Street (W) to Bent Street (S)	48	50	27	26	67	33.2	3.62	2.22	1.13	-22	17	6.2	-45.8	34.0	23.0
Bent Street (S) to Through Street (W)	21	40	29	16.8	47.6	23.8	0.97	1.15	1.01	-4.2	7.6	-5.2	-20.0	19.0	-17.9
Bent Street (S) to Through Street (NT)	584	1104	784	644.4	1088.4	965.6	2.44	0.47	6.14	60.4	-15.6	181.6	10.3	-1.4	23.2
Bent Street (S) to Through Street (E)	44	84	60	16.8	52.2	24.8	4.93	3.85	5.41	-27.2	-31.8	-35.2	-61.8	-37.9	-58.7
Through Street (E) to Bent Street (S)	0	0	0	1.4	11.8	19	1.67	4.86	6.16	1.4	11.8	19	-	-	-
Through Street (E) to Through Street (W)	4	8	4	2.4	4.8	2.4	0.89	1.26	0.89	-1.6	-3.2	-1.6	-40.0	-40.0	-40.0
Through Street (E) to Bent Street (N)	130	227	182	92.6	193	145.2	3.55	2.35	2.88	-37.4	-34	-36.8	-28.8	-15.0	-20.2
Bent Street (N) to Through Street (E)	31	54	43	25	67.6	28.2	1.13	1.74	2.48	-6	13.6	-14.8	-19.4	25.2	-34.4
Bent Street (N) to Bent Street (ST)	398	583	554	461.4	671.8	593.4	3.06	3.55	1.64	63.4	88.8	39.4	15.9	15.2	7.1
Bent Street (N) to Through Street (W)	53	94	75	52	91.8	58.6	0.14	0.23	2.01	-1	-2.2	-16.4	-1.9	-2.3	-21.9
Gwydir Hwy (W) to Bent Street (N)	112	192	160	127	204.8	175	1.37	0.91	1.16	15	12.8	15	13.4	6.7	9.4
Gwydir Hwy (W) to Gwydir Hwy (E)	75	102	94	63.4	80.4	58.2	1.39	2.26	4.10	-11.6	-21.6	-35.8	-15.5	-21.2	-38.1
Gwydir Hwy (W) to Bent Street (S)	60	83	106	84.2	92.6	92.4	2.85	1.02	1.37	24.2	9.6	-13.6	40.3	11.6	-12.8
Bent Street (S) to Gwydir Hwy (W)	35	75	62	45.8	89.2	44	1.70	1.57	2.47	10.8	14.2	-18	30.9	18.9	-29.0
Bent Street (S) to Bent Street (N)	358	601	527	385.4	564.6	486	1.42	1.51	1.82	27.4	-36.4	-41	7.7	-6.1	-7.8
Bent Street (S) to Gwydir Hwy (E)	25	43	27	32.8	52.2	33	1.45	1.33	1.10	7.8	9.2	6	31.2	21.4	22.2
Gwydir Hwy (E) to Bent Street (S)	18	54	22	21.6	42.4	22.8	0.81	1.67	0.17	3.6	-11.6	0.8	20.0	-21.5	3.6
Gwydir Hwy (E) to Gwydir Hwy (W)	52	81	50	52.6	96	83.8	0.08	1.59	4.13	0.6	15	33.8	1.2	18.5	67.6
Gwydir Hwy (E) to Bent Street (N)	181	371	156	241.8	491.2	277	4.18	5.79	8.22	60.8	120.2	121	33.6	32.4	77.6
Bent Street (N) to Gwydir Hwy (E)	88	103	135	121	199.8	174.8	3.23	7.87	3.20	33	96.8	39.8	37.5	94.0	29.5
Bent Street (N) to Bent Street (S)	237	365	317	227	284.4	252.2	0.66	4.47	3.84	-10	-80.6	-64.8	-4.2	-22.1	-20.4
Bent Street (N) to Gwydir Hwy (W)	51	105	128	56	144.8	105	0.68	3.56	2.13	5	39.8	-23	9.8	37.9	-18.0
Villers Street (N) to Bent Street (E)	159	259	179	162.4	239.8	191.6	0.27	1.22	0.93	3.4	-19.2	12.6	2.1	-7.4	7.0
Villers Street (N) to Villers Street (S)	36	58	40	26.6	48.8	34.4	1.68	1.26	0.92	-9.4	-9.2	-5.6	-26.1	-15.9	-14.0
Villers Street (N) to Bent Street (W)	18	30	21	10.6	19.8	19	1.96	2.04	0.45	-7.4	-10.2	-2	-41.1	-34.0	-9.5
Bent Street (W) to Villers Street (N)	30	48	33	28.2	50	33	0.33	0.29	0.00	-1.8	2	0	-6.0	4.2	0.0
Bent Street (W) to Bent Street (E-V)	305	496	343	354.6	505.4	420.4	2.73	0.42	3.96	49.6	9.4	77.4	16.3	1.9	22.6
Bent Street (W) to Villers Street (S)	20	32	22	20	33	25.6	0.00	0.18	0.74	0	1	3.6	0.0	3.1	16.4
Villers Street (S) to Bent Street (W)	15	24	17	14.6	23.6	18	0.10	0.08	0.24	-0.4	-0.4	1	-2.7	-1.7	5.9
Villers Street (S) to Villers Street (N)	17	28	19	18	27	20.6	0.24	0.19	0.36	1	-1	1.6	5.9	-3.6	8.4
Villers Street (S) to Bent Street (E)	22	35	24	19.2	29.8	22.6	0.62	0.91	0.29	-2.8	-5.2	-1.4	-12.7	-14.9	-5.8
Bent Street (E) to Villers Street (S)	51	83	57	45.8	90.4	86.2	0.75	0.79	3.45	-5.2	7.4	29.2	-10.2	8.9	51.2
Bent Street (E) to Bent Street (W-V)	542	881	609	537.2	886.2	837.8	0.21	0.17	8.51	-4.8	5.2	228.8	-0.9	0.6	37.6
Bent Street (E) to Villers Street (N)	255	415	287	217.6	367	373	2.43	2.43	4.73	-37.4	-48	86	-14.7	-11.6	30.0

PM Turn Flow Results

Location	Observed			Modelled			GEH			Actual Difference			Percentage Difference		
	4-5	5-6	6-7	4-5	5-6	6-7	4-5	5-6	6-7	4-5	5-6	6-7	4-5	5-6	6-7
PM Intervals															
Spring Street (W) to Bent Street (N)	47	31	24	13.2	11.2	3.6	6.16	4.31	5.49	-33.8	-19.8	-20.4	-71.9	-63.9	-85.0
Bent Street (S) to Spring Street (W)	37	39	19	56.2	53.4	32.2	2.81	2.12	2.61	19.2	14.4	13.2	51.9	36.9	69.5
Bent Street (S) to Bent Street (N)	724	686	588	858	872.2	674.4	4.76	6.67	3.44	134	186.2	86.4	18.5	27.1	14.7
Bent Street (N) to Spring Street (S)	942	991	538	949.2	975.4	783.2	0.23	0.50	9.54	7.2	-15.6	245.2	0.8	-1.6	45.6
Bent Street (N) to Bent Street (E)	115	103	49	104.6	95.2	108	0.99	0.78	6.66	-10.4	-7.8	59	-9.0	-7.6	120.4
Spring Street (E) to Bent Street (S)	120	102	60	121.4	94.2	52.2	0.13	0.79	1.04	1.4	-7.8	-7.8	1.2	-7.6	-13.0
Gwydir Hwy (W) to Bligh Street (N)	26	26	23	7.2	5.6	19.2	4.61	5.13	0.83	-18.8	-20.4	-3.8	-72.3	-78.5	-16.5
Gwydir Hwy (W) to Gwydir Hwy (E)	278	283	169	366.6	369.6	192	4.94	4.79	1.71	88.6	86.6	23	31.9	30.6	13.6
Gwydir Hwy (W) to Bligh Street (S)	18	29	8	12.8	29.8	13.8	1.33	0.15	1.76	-5.2	0.8	5.8	-28.9	2.8	72.5
Bligh Street (S) to Gwydir Hwy (W)	22	20	7	27.8	19.4	23.8	1.16	0.14	4.28	5.8	-0.6	16.8	26.4	-3.0	240.0
Bligh Street (S) to Bligh Street (N)	8	10	10	7.6	14.6	12	0.14	1.31	0.60	-0.4	4.6	2	-5.0	46.0	20.0
Bligh Street (S) to Gwydir Hwy (E)	9	11	2	12.2	17.6	9	0.98	1.75	2.98	3.2	6.6	7	35.6	60.0	350.0
Gwydir Hwy (E) to Bligh Street (S)	20	16	7	18.8	16	6.2	0.27	0.00	0.31	-1.2	0	-0.8	-6.0	0.0	-11.4
Gwydir Hwy (E) to Gwydir Hwy (W)	361	380	256	369.2	360.8	261.8	0.43	1.00	0.36	8.2	-19.2	5.8	2.3	-5.1	2.3
Gwydir Hwy (E) to Bligh Street (N)	19	9	6	19	13	2	0.00	1.21	2.00	0	4	-4	0.0	44.4	-66.7
Bligh Street (N) to Gwydir Street (E)	89	89	61	75.8	48.2	51.6	1.45	4.93	1.25	-13.2	-40.8	-9.4	-14.8	-45.8	-15.4
Bligh Street (N) to Bligh Street (S)	32	32	20	35.6	33.4	6.2	0.62	0.24	3.81	3.6	1.4	-13.8	11.3	4.4	-69.0
Bligh Street (N) to Gwydir Street (W)	43	30	32	51	34.4	24.2	1.17	0.78	1.47	8	4.4	-7.8	18.6	14.7	-24.4
Ryan Street (W) to Underpass (N)	47	44	18	49.6	22.6	9.8	0.37	3.71	2.20	2.6	-21.4	-8.2	5.5	-48.6	-45.6
Ryan Street (W) to Ryan Street (E)	369	352	184	398.6	337.2	200	1.51	0.80	1.15	29.6	-14.8	16	8.0	-4.2	8.7
Ryan Street (E) to Ryan Street (W)	284	243	159	238.2	232.8	145.2	2.83	0.66	1.12	-45.8	-10.2	-13.8	-16.1	-4.2	-8.7
Ryan Street (E) to Underpass (N)	85	60	37	105.8	79.2	61	2.13	2.30	3.43	20.8	19.2	24	24.5	32.0	64.9
Underpass (N) to Ryan Street (E)	61	59	27	50	64.2	30	1.48	0.66	0.56	-11	5.2	3	-18.0	8.8	11.1
Underpass (N) to Ryan Street (W)	28	24	14	52.6	22.4	8.8	3.88	0.33	1.54	24.6	-1.6	-5.2	87.9	-6.7	-37.1
Underpass (S) to Pacific Hwy (E)	39	35	27	31.4	20.4	28.6	1.28	2.77	0.30	-7.6	-14.6	1.6	-19.5	-41.7	5.9
Underpass (S) to Pacific Hwy (W)	75	47	21	116.4	80.8	65.8	4.23	4.23	6.80	41.4	33.8	44.8	55.2	71.9	213.3
Pacific Hwy (E) to Underpass (S)	47	40	19	57.4	47.2	17.4	1.44	1.09	0.38	10.4	7.2	-1.6	22.1	18.0	-8.4
Pacific Hwy (E) to Pacific Hwy (W)	309	246	188	301.4	259.2	140.4	0.44	0.83	3.71	-7.6	13.2	-47.6	-2.5	5.4	-25.3
Pacific Hwy (W) to Pacific Hwy (E)	411	410	229	349	385.8	294.2	3.18	1.21	4.03	-62	-24.2	65.2	-15.1	-5.9	28.5
Pacific Hwy (W) to Underpass (S)	53	54	24	70.4	66	34.8	2.22	1.55	1.99	17.4	12	10.8	32.8	22.2	45.0
Pacific Hwy (W) to Spring Street (N)	124	100	59	109.4	100.6	56.8	1.35	0.06	0.29	-14.6	0.6	-2.2	-11.8	0.6	-3.7
Pacific Hwy (W) to Pacific Hwy (E)	248	210	163	323.6	263	187.8	4.47	3.45	1.87	75.6	53	24.8	30.5	25.2	15.2
Pacific Hwy (E) to Pacific Hwy (W)	88	90	71	77.8	73.2	73.2	1.12	1.86	0.26	-10.2	-16.8	2.2	-11.6	-18.7	3.1
Spring Street (N) to Pacific Hwy (E)	169	172	77	96.4	97.8	66.8	6.30	6.39	1.20	-72.6	-74.2	-10.2	-43.0	-43.1	-13.2
Spring Street (N) to Pacific Hwy (W)	89	90	32	120.6	55.6	24.8	3.09	4.03	1.35	31.6	-34.4	-7.2	35.5	-38.2	-22.5
Gwydir Hwy (W) to Pacific Hwy (N)	130	146	105	158.4	163.4	123.8	2.37	1.40	1.76	28.4	17.4	18.8	21.8	11.9	17.9
Gwydir Hwy (W) to Pacific Hwy (S)	202	231	95	185.2	239	151.8	1.21	0.52	5.11	-16.8	8	56.8	-8.3	3.5	59.8
Pacific Hwy (S) to Gwydir Hwy (W)	164	140	94	161.2	148	106.8	0.22	0.67	1.28	-2.8	8	12.8	-1.7	5.7	13.6
Pacific Hwy (S) to Pacific Hwy (N)	231	173	128	275	200.8	120.4	2.77	2.03	0.68	44	27.8	-7.6	19.0	16.1	-5.9
Pacific Hwy (N) to Gwydir Hwy (W)	80	99	54	119.2	143.8	57	3.93	4.07	0.40	39.2	44.8	3	49.0	45.3	5.6
Pacific Hwy (N) to Pacific Hwy (S)	254	225	149	236	212.4	176	1.15	0.85	2.12	-18	-12.6	27	-7.1	-5.6	18.1

appendix

Through Street (W) to Bent Street (N)	77	119	105	78.2	123.2	155	0.14	0.38	4.39	1.2	4.2	50	1.6	3.5	47.6
Through Street (W) to Through Street (E)	4	6	4	14	12.2	15	3.33	2.06	3.57	10	6.2	11	250.0	103.3	275.0
Through Street (W) to Bent Street (S)	11	11	6	21.4	20.6	20.8	2.58	2.42	4.04	10.4	9.6	14.8	94.5	87.3	246.7
Bent Street (S) to Through Street (W)	8	7	6	9.4	31	39.6	0.47	5.51	7.04	1.4	24	33.6	17.5	342.9	560.0
Bent Street (S) to Bent Street (N)	463	403	325	453.2	411.4	359.8	0.46	0.42	1.88	-9.8	8.4	34.8	-2.1	2.1	10.7
Bent Street (S) to Through Street (E)	0	0	0	7.2	4.4	2.6	3.79	2.97	2.28	7.2	4.4	2.6	-	-	-
Through Street (E) to Bent Street (S)	11	11	6	2	5	14.6	3.53	2.12	2.68	-9	-6	8.6	-81.82	-54.55	143.33
Through Street (E) to Through Street (W)	4	6	4	1.8	4.4	3.2	1.29	0.70	0.42	-2.2	-1.6	-0.8	-55.0	-26.7	-20.0
Through Street (E) to Bent Street (N)	114	177	154	125.6	168.6	211.4	1.06	0.64	4.25	11.6	-8.4	57.4	10.2	-4.7	37.3
Bent Street (N) to Through Street (E)	93	145	127	70	107.6	128.4	2.55	3.33	0.12	-23	-37.4	1.4	-24.7	-25.8	1.1
Bent Street (N) to Bent Street (S)	559	575	313	466.2	459	368.4	4.10	5.10	3.00	-92.8	-116	55.4	-16.6	-20.2	17.7
Bent Street (N) to Through Street (W)	158	245	215	136.6	210	275.8	1.76	2.32	3.88	-21.4	-35	60.8	-13.5	-14.3	28.3
Gwydir Hwy (W) to Bent Street (N)	133	157	96	177.2	166.6	108.6	3.55	0.75	1.25	44.2	9.6	12.6	33.2	6.1	13.1
Gwydir Hwy (W) to Gwydir Hwy (E)	115	129	59	104.2	115.4	64.6	1.03	1.23	0.71	-10.8	-13.6	5.6	-9.4	-10.5	9.5
Gwydir Hwy (W) to Bent Street (S)	124	153	74	171.8	154.2	95.2	3.93	0.10	2.30	47.8	1.2	21.2	38.5	0.8	28.6
Bent Street (S) to Gwydir Hwy (W)	68	62	47	97.2	67.6	43.8	3.21	0.70	0.47	29.2	5.6	-3.2	42.9	9.0	-6.8
Bent Street (S) to Gwydir Hwy (E)	37	37	24	30.4	57.2	32.2	1.14	2.94	1.55	-6.6	20.2	8.2	-17.8	54.6	34.2
Gwydir Hwy (E) to Bent Street (S)	37	34	8	23	29	2.8	2.56	0.89	2.24	-14	-5	-5.2	-37.8	-14.7	-65.0
Gwydir Hwy (E) to Gwydir Hwy (W)	81	73	51	77.8	71.6	22.2	0.36	0.16	4.76	-3.2	-1.4	-28.8	-4.0	-1.9	-56.5
Gwydir Hwy (E) to Bent Street (N)	176	182	95	169	195.4	144.6	0.53	0.98	4.53	-7	13.4	49.6	-4.0	7.4	52.2
Bent Street (N) to Gwydir Hwy (E)	150	197	88	210.2	232.2	193	4.49	2.40	8.86	60.2	35.2	105	40.1	17.9	119.3
Bent Street (N) to Gwydir Hwy (W)	255	274	174	233.8	250.4	203.2	1.36	1.46	2.13	-21.2	-23.6	29.2	-8.3	-8.6	16.8
Villers Street (N) to Bent Street (E)	398	374	251	307.6	224.2	313.4	4.81	8.66	3.71	-90.4	-149.8	62.4	-22.7	-40.1	24.9
Villers Street (N) to Villers Street (S)	36	34	23	26.4	20.4	28.4	1.72	2.61	1.07	-9.6	-13.6	5.4	-26.7	-40.0	23.5
Villers Street (N) to Bent Street (W)	38	36	24	26.2	18	29	2.08	3.46	0.97	-11.8	-18	5	-31.1	-50.0	20.8
Bent Street (W) to Villers Street (N)	31	29	20	34	32.4	22.6	0.53	0.61	0.56	3	3.4	2.6	9.7	11.7	13.0
Bent Street (W) to Bent Street (E-V)	795	747	501	805.4	788.6	582.4	0.37	1.50	3.50	10.4	41.6	81.4	1.3	5.6	16.2
Bent Street (W) to Villers Street (S)	20	19	13	30.6	31.6	25	2.11	2.51	2.75	10.6	12.6	12	53.0	66.3	92.3
Villers Street (S) to Bent Street (W)	25	24	16	24.8	21	13.6	0.04	0.63	0.62	-0.2	-3	-2.4	-0.8	-12.5	-15.0
Villers Street (S) to Villers Street (N)	47	44	30	42.8	43	29.6	0.63	0.15	0.07	-4.2	-1	-0.4	-8.9	-2.3	-1.3
Villers Street (S) to Bent Street (E)	147	138	93	141.2	158.6	98.6	0.48	1.69	0.57	-5.8	20.6	5.6	-3.9	14.9	6.0
Bent Street (E) to Villers Street (S)	88	83	55	76.6	90.4	79.2	1.26	0.79	2.95	-11.4	7.4	24.2	-13.0	8.9	44.0
Bent Street (E) to Bent Street (W-V)	584	549	368	559.2	606.6	550.6	1.04	2.40	8.52	-24.8	57.6	182.6	-4.2	10.5	49.6
Bent Street (E) to Villers Street (N)	387	364	244	362.2	401	327.8	1.28	1.89	4.96	-24.8	37	83.8	-6.4	10.2	34.3

Appendix C

Existing Conditions Network Model – Network Evaluation Output



appendix c

appendix

Existing Conditions

7:30 - 9:30

Existing	Measured Totals											Estimated Totals						Resultant Derived Averages (per vehicle)								
	Count				Freelflow	Trip Time	Distance			Time	Distance				Total	Cost(\$)	Trip Time	Distance	Speed	Delay						
	All	Cars	Light	Heavy	(min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy		
Complete	10834.2	9350.6	822.2	661.4	26540.8	44745.4	18421	46956.6	3793.6	2799.4	0	0	0	0	0	20508.76	1.86625	4.08125	1.70225	28.3865	1.62925	2.8015	2.62525	2.3355		
Incomplete	622.6	531.8	47.2	43.6	792.398	2594.414	570.806	3125.8	237.2	221.2	5378.716	1450.844	6096.558	260.924	228.698	2220.438	3.05975	7.30875	2.33675	24.21925	4.85675	5.24075	4.4835	4.55125		
Total	11456.8	9882.4	869.4	705	27331.6	47339	18992	50082.4	4030.8	3020.6	50123.2	19872.2	53053.44	4054.418	3028.078	22729.22	0	0	0	0	0	0	0	0	0	
2013 AM	Complete	11372.4	9805.6	884.2	682.6	27672.6	62761.2	19262.2	64555	5368	3747.4	0	0	0	0	27038.26	2.315	5.36825	1.6935	24.4585	2.935	3.6245	3.3905	3.159		
Incomplete	835.2	722.4	61.8	51	973.374	6399.526	706.372	5698.2	483.6	346.8	12257.52	1921	11296.45	525.054	353.928	4479.02	4.5045	12.09675	2.31525	18.6345	9.6645	7.90175	8.05025	6.85625		
Total	12207.6	10528	946	733.6	28645.8	69161.8	19968	70253.2	5851.6	4094.2	75018.4	21182.4	75851.46	5893.166	4101.35	31517.68	0	0	0	0	0	0	0	0	0	
2018 AM	Complete	11903	10318	878.4	706.6	28220.6	67397	19721.8	68765.4	5289.8	3848	0	0	0	0	28582.68	2.33575	5.50225	1.656	23.62375	3.133	3.77275	3.52475	3.136		
Incomplete	880.4	771.2	58.2	51	1069.772	6547.07	765.406	5821.4	449.4	333.8	12567.6	2011.834	11647.47	475.572	336.398	4581.204	4.45925	12.04725	2.29475	18.0645	9.67825	7.446	8.1205	7.036		
Total	12783.4	11089.2	936.6	757.6	29291.2	73943.4	20487.8	74586.8	5739.2	4181.8	79964	21733.4	80412.84	5765.498	4184.46	33163.64	0	0	0	0	0	0	0	0	0	
2028 AM	Complete	12893.6	11215.2	934.4	744	29801	79628	20923.2	80594.2	6191.4	4478.6	0	0	0	0	33112.52	2.50575	6.00875	1.624	21.853	3.696	4.18225	3.9915	3.5725		
Incomplete	961	845.4	58.2	51	1251.786	7334.386	884.85	6963	465.6	398.2	13914.17	2181.932	13382.87	486.526	407.58	5095.808	4.5795	12.32775	2.27275	17.10525	10.0145	7.7665	7.9245	7.00225		
Total	13854.6	12060.6	992.6	801.4	31053.6	86960.8	21808.2	87557.2	6657	4876.8	93541.4	23104.8	93976.82	6677.768	4885.834	38207.98	0	0	0	0	0	0	0	0	0	

8:30 - 9:30

Existing	Measured Totals											Estimated Totals						Resultant Derived Averages (per vehicle)								
	Count				Freelflow	Trip Time	Distance			Time	Distance				Total	Cost(\$)	Trip Time	Distance	Speed	Delay						
	All	Cars	Light	Heavy	(min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy		
Complete	5653.4	4886.2	419.6	347.6	14211.6	30212.2	9841.2	37290.2	2986.8	2227.2	0	0	0	0	0	13809.8	2.4725	5.4165	1.746	20.2225	2.895	4.4245	4.1725	3.6855		
Incomplete	405.4	346.4	31.2	27.8	489.62	2099.434	355.606	2540	202.6	172.4	4359.62	951.156	5191.7	222.936	180.012	1762.3	4.192	10.296	2.363	15.2565	7.7755	7.9315	7.035	6.9595		
Total	6058.8	5232.6	450.8	375.4	14700.8	32311.2	10197	39830.2	3189.4	2399.6	34571.4	10792.8	42482	3209.66	2407.18	15571.8	0	0	0	0	0	0	0	0	0	
2013 AM	Complete	5867.8	5076.4	447.6	343.8	14741.6	46466.6	10240.8	51920.4	4241.6	2981.2	0	0	0	0	19454.8	3.3055	7.876	1.748	13.766	5.359	5.816	5.4195	5.0565		
Incomplete	961	490.6	42.8	32.2	628.88	5472.32	457.298	4583	396.8	265.6	10525.6	1293.54	9520.8	434.156	271.468	3732.2	6.6875	18.878	2.292	7.6	16.361	11.963	12.508	10.283		
Total	6433.4	5567	490.4	376	15370.8	51939.2	10698.2	56503.4	4638.4	3246.8	56991.4	11534.4	61441.2	4675.86	3252.7	23187.2	0	0	0	0	0	0	0	0	0	
2018 AM	Complete	6183.6	5397.2	429.8	356.6	15055.8	50130	10503.6	54338	4061	2920	0	0	0	0	20509.8	3.318	8.097	1.701	12.865	5.659	5.9345	5.5875	4.82		
Incomplete	571.8	509.2	33.4	29.2	686.6	5391.2	490.62	4493	324.8	235.6	10430.2	1306.44	9433.6	346.728	239.958	3672.62	6.5045	18.498	2.2895	7.6205	16.061	10.671	12.3435	10.134		
Total	6755.4	5906.4	463.2	385.8	15742.8	55521.2	10994.8	58831	4385.8	3155.6	60559.4	11810.2	63771.6	4407.78	3160.06	24182.6	0	0	0	0	0	0	0	0	0	
2028 AM	Complete	6670.6	5834.4	464.2	372	15949	59742.6	11172	62232.6	4682.8	3414.8	0	0	0	0	23891.6	3.585	8.9365	1.676	11.4375	6.5455	6.3915	6.129	5.454		
Incomplete	614.8	546.8	35.2	32.8	780.8	5861	551.83	5239.6	355.8	264.2	11344.4	1394.96	10576	372.14	274.596	4012.86	6.612	18.715	2.279	7.421	16.3225	11.0605	11.8695	9.756		
Total	7285.4	6381.2	499.4	404.8	16730	65603	11723.6	67472.2	5038.6	3679	71086.8	12566.6	72808.6	5054.84	3689.12	27904	0	0	0	0	0	0	0	0	0	

7:00 - 7:15

Existing	Measured Totals											Estimated Totals						Resultant Derived Averages (per vehicle)								
	Count				Freelflow	Trip Time	Distance			Time	Distance				Total	Cost(\$)	Trip Time	Distance	Speed	Delay						
	All	Cars	Light	Heavy	(min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy		
Complete	390.8	337.2	27.8	25.8	868.2	885.16	607.62	221.2	14.8	15.6	0	0	0	0	389.26	0.998	2.266	1.554	41.194	0.044	0.422	0.34	0.394			
Incomplete	19.2	15.8	1	2.4	31.946	34.404	22.09	7.2	0.8	2	65.294	43.142	10.47	0.8	2	28.176	1.464	3.394	2.242	39.62	1.17	0.394	0.478	0.536		
Total	410	353	28.8	28.2	900.12	919.58	629.88	228.4	15.6	17.6	950.38	650.74	231.68	15.6	17.6	417.46	0	0	0	0	0	0	0	0	0	
2013 AM	Complete	403.8	348.6	34	21.2	869.46	881.74	611.3	213	16	11	0	0	0	0	387.38	0.958	2.184	1.512	41.612	0.032	0.404	0.31	0.342		
Incomplete	18.8	16.8	1.2	0.8	31.592	33.688	21.294	13.4	0.4	1.2	60.41	39.8	16.14	0.406	0.82	25.988	1.37	3.194	2.106	39.556	1.042	0.624	0.176	0.65		
Total	422.6	365.4	35.2	22	901.08	915.38	632.58	226.4	16.4	12.2	942.08	651.1	229.14	16.406	11.82	413.36	0	0	0	0	0	0	0	0	0	
2018 AM	Complete	429.6	370.2	34.4	25	926.8	947.66	654.34	250.4	20.2	17.8	0	0	0	0	420.04	0.976	2.204	1.524	41.444	0.048	0.446	0.38	0.454		
Incomplete	18.4	15.6	1.2	1.6	32.102	34.376	22.344	12.2	1.6	1.2	61.898	41.014	16.334	1.7	1.2	27.128	1.476	3.354	2.226	39.796	1.2	0.696	0.226	0.586		
Total	448	385.8	35.6	26.6	958.76	982.1	676.7	262.6	21.8	19	1009.66	695.36	266.74	21.9	19	447.18	0	0	0	0	0	0	0	0	0	
2028 AM	Complete	498	434.8	37.8	25.4	1017.14	1043.32	724.1	303.2	27.6	23.6	0	0	0	0	467.96	0.94	2.094	1.45	41.644	0.054	0.474	0.496	0.64		
Incomplete	22.6	19	1.8	1.8	32.048	35.318	22.216	11.6	0.8	0.8	74.506	48.804	18.36	0.844	0.802	31.892	1.418	3.312	2.17	39.322	1.272	0.632	0.286	0.136		
Total	520.6	453.8	39.																							

appendix

7:15 - 7:30

Existing	Measured Totals										Estimated Totals					Resultant Derived Averages (per vehicle)										
					Freeflow	Trips Time	Distance				Time	Distance				Total	Cost(\$)	Cost(\$)	Trips Time	Distance	Speed	Delay				
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy		
Complete	1002.6	860.2	77	65.4	2347.2	2410.2	1633.4	681.8	55.4	48.4	0	0	0	0	1065.96	1.064	2.404	1.63	40.66	0.066	0.484	0.436	0.456			
Incomplete	21.4	18	1.2	2.2	35.308	39.15	24.31	16.2	0	1.8	75.586	49.178	24.032	0.076	1.232	32.578	1.522	3.528	2.296	39.094	1.186	0.828	0	0.716		
Total	1024	878.2	78.2	67.6	2382.6	2449.6	1657.6	698	55.4	50.2	2486	1682.4	705.86	55.476	49.632	1098.6	0	0	0	0	0	0	0	0		
2013 AM																										
Complete	1067.4	921.2	82.2	64	2416.6	2486.8	1692.8	797	60.4	58.6	0	0	0	0	1111.4	1.04	2.328	1.584	40.844	0.066	0.546	0.468	0.578			
Incomplete	25.8	19.8	2	4	47.726	52.488	32.898	17.2	1.2	3.2	91.566	59.516	25.284	1.294	2.474	39.872	1.536	3.518	2.284	38.956	1.252	0.672	0.318	0.83		
Total	1093.2	941	84.2	68	2464.4	2539.2	1725.4	814.2	61.6	61.8	2578.2	1752.4	822.28	61.694	61.074	1151.4	0	0	0	0	0	0	0	0		
2018 AM																										
Complete	1088.8	934	84.6	70.2	2467.2	2540.2	1731.8	760.6	67.2	60.4	0	0	0	0	1134.2	1.042	2.334	1.592	40.908	0.066	0.514	0.5	0.54			
Incomplete	28.4	23.4	2.2	2.8	44.128	48.968	30.648	18	3.6	3	97.38	63.156	26.644	3.748	2.854	43.04	1.506	3.418	2.224	39.038	1.152	0.696	0.862	0.824		
Total	1117.2	957.4	86.8	73	2511.4	2588.8	1762.4	778.6	70.8	63.4	2637.6	1794.6	787.24	70.948	63.254	1177.4	0	0	0	0	0	0	0	0		
2028 AM																										
Complete	1235.6	1068.2	94	73.4	2663.8	2764.8	1884.8	970.4	84.4	75.4	0	0	0	0	1250.4	1.01	2.238	1.526	40.912	0.082	0.594	0.586	0.668			
Incomplete	30.6	25	2.2	3.4	54.466	59.978	37.666	20.4	1	1.6	110.812	71.958	32.46	1.092	1.476	47.674	1.558	3.618	2.35	38.986	1.462	0.674	0.344	0.374		
Total	1266.2	1093.2	96.2	76.8	2718.4	2824.6	1922.8	990.8	85.4	77	2875.4	1956.8	1002.8	85.492	76.876	1298	0	0	0	0	0	0	0	0		

7:30 - 7:45

Existing	Measured Totals										Estimated Totals					Resultant Derived Averages (per vehicle)										
					Freeflow	Trips Time	Distance				Time	Distance				Total	Cost(\$)	Cost(\$)	Trips Time	Distance	Speed	Delay				
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy		
Complete	655.2	568	48	39.2	1565.2	1624	1084.6	585.6	45.8	32	0	0	0	0	724.36	1.106	2.478	1.656	40.094	0.088	0.622	0.572	0.494			
Incomplete	26	22.2	2.2	1.6	40.018	44.03	27.33	16.6	1.4	0.6	92.696	59.834	28.636	1.498	0.67	39.824	1.532	3.566	2.302	38.738	1.176	0.722	0.54	0.172		
Total	681.2	590.2	50.2	40.8	1604.8	1668	1112	602.2	47.2	32.6	1716.6	1144.4	614.24	47.298	32.67	764.22	0	0	0	0	0	0	0	0		
2013 AM																										
Complete	722	619	53.6	49.4	1686.4	1761.4	1177.2	653.4	54	44.4	0	0	0	0	791.66	1.098	2.438	1.632	40.094	0.102	0.646	0.618	0.55			
Incomplete	28.4	23	2.2	3.2	49.582	54.126	34.256	15.6	1.4	2.4	104.042	67.246	27.47	1.406	2.53	45.016	1.584	3.662	2.366	38.762	1.33	0.582	0.632	0.602		
Total	750.4	642	55.8	52.6	1735.8	1816	1211.2	669	55.4	46.8	1865.6	1244	680.86	55.406	46.93	836.68	0	0	0	0	0	0	0	0		
2018 AM																										
Complete	767.8	662.4	58.2	47.2	1752.4	1837.6	1225.6	706.6	65.8	44.6	0	0	0	0	828.68	1.078	2.392	1.596	40.034	0.112	0.666	0.698	0.586			
Incomplete	30	25.6	2.2	2.2	49.822	55.188	34.302	22.8	0.8	2.4	109.142	69.788	36.868	0.886	2.52	47.358	1.584	3.646	2.332	38.394	1.364	0.772	0.324	1.3		
Total	797.8	688	60.4	49.4	1802.4	1892.4	1260	729.4	66.6	47	1946.6	1295.6	743.44	66.678	47.12	876.04	0	0	0	0	0	0	0	0		
2028 AM																										
Complete	872.4	749.6	65.2	57.6	1969	2087	1381.8	880	72.4	53.2	0	0	0	0	943.92	1.082	2.394	1.584	39.732	0.134	0.74	0.696	0.584			
Incomplete	28.4	24.6	2.6	1.2	47.69	52.64	33.046	23.4	1.4	0.4	99.314	63.818	34.532	1.548	0.434	42.726	1.504	3.498	2.246	38.554	1.24	0.77	0.388	0.168		
Total	900.8	774.2	67.8	58.8	2017	2139.2	1414.6	903.4	73.8	53.6	2186	1445.4	914.62	73.948	53.634	986.58	0	0	0	0	0	0	0	0		

7:45 - 8:00

Existing	Measured Totals										Estimated Totals					Resultant Derived Averages (per vehicle)										
					Freeflow	Trips Time	Distance				Time	Distance				Total	Cost(\$)	Cost(\$)	Trips Time	Distance	Speed	Delay				
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy		
Complete	1578	1358.8	121.2	98	3682	3925	2563.2	1685.4	153.4	111.4	0	0	0	0	1777.2	1.13	2.486	1.626	39.19	0.154	0.764	0.78	0.7			
Incomplete	41.6	36.8	3.4	1.4	65.584	79.206	47.606	47	3.4	2.8	157.04	97.974	71.582	3.524	2.818	68.994	1.662	3.784	2.36	37.454	1.448	1.11	1.036	1.544		
Total	1619.6	1395.6	124.6	99.4	3750.4	4004	2611	1732.4	156.8	114.2	4081.8	2661.4	1757	156.92	114.226	1846.4	0	0	0	0	0	0	0	0		
2013 AM																										
Complete	1726.8	1480.4	132.6	113.8	3920.8	4214.4	2741.2	1968.8	166.8	142.4	0	0	0	0	1924.6	1.112	2.442	1.586	39.026	0.17	0.838	0.788	0.784			
Incomplete	39	34.4	3	1.6	56.964	67.34	40.252	45.4	4.2	2.8	145.46	90.554	69.136	4.356	2.942	64.444	1.652	3.73	2.322	37.342	1.462	1.29	0.752	1.18		
Total	1765.8	1514.8	135.6	115.4	3977.6	4281.8	2781.4	2014.2	171	145.2	4359.8	2831.6	171.16	145.34	1989.2	0	0	0	0	0	0	0	0	0		
2018 AM																										
Complete	1824	1575.2	137.6	111.2	4052.4	4411	2847.2	2206	194.6	147.4	0	0	0	0	2023.4	1.11	2.418	1.56	38.736	0.194	0.898	0.894	0.848			
Incomplete	44	36.2	3.8	4	69.298	89.482	48.45	76.2	6.4	6.2	173.46	101.146	104.778	7.362	6.358	78.226	1.74	3.872	2.282	35.538	1.65	1.77	1.364	1.278		
Total	1868	1611.4	141.4	115.2	4121.8	4500.4	2895.6	2282.2	201	153.6	4584.4	2948.2	2310.8	201.96	153.74	2101.4	0	0	0	0	0	0	0	0		
2028 AM																										
Complete	2022.4	1742	148.6	131.8	4396.8	4939.4	3099.6	2777.4	217.6	172.2	0	0	0	0	2266.4	1.118	2.444	1.53	37.654	0.268	1.042	0.954	0.854			
Incomplete	51	42.6	4.2	4.2	78.4	111.306	54.574	101.8	9.6	8.2	212.3	116.534	143.74	9.034	7.942	95.042	1.852	4.14	2.28	33.114	1.964	2.214	2.054	1.898		
Total	2073.4	1784.6	152.8	136	4475.6	5050.4	3154.6	2879.2	227.2	180.4	5151.8	3216.4	2921	226.64	180.16	2361.6	0	0	0	0	0	0	0	0		

appendix

8:45 - 9:00

	Measured Totals													Estimated Totals					Resultant Derived Averages (per vehicle)									
	All				Cars			Light			Heavy			Time	Distance	Cars	Light	Heavy	Total		Trip Time	Distance	Speed	Delay		Cars	Light	Heavy
	Freeflow	Trip Time	Distance	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy					
Existing	Complete	2024.4	1748.6	153.4	122.4	4936.4	9467.6	3418.6	11781.8	960.2	760.8	0	0	0	0	4444.2	2,196	4,678	1,688	22,002	2,238	3,99	3,686					
	Incomplete	131.4	115.4	9	7	138.56	701.3	101.998	868.2	64	42	1365.56	294.3	1662.4	68.55	44,006	548.5	4,162	10,336	2,244	13,266	7,898	9,58	9,09	8,104			
	Total	2155.8	1864	162.4	129.4	5075	10169	3520.4	12650	1024.2	802.8	10833.2	3712.8	13444.2	1028.66	804.8	4992.6	0	0	0	0	0	0	0				
2013 AM	Complete	1948	1668.8	158.4	120.8	4813.2	13594	3338.4	16032.6	1477.2	964.2	0	0	0	0	5922	3,044	6,99	1,712	14,76	4,52	5,622	5,456	4,694				
	Incomplete	163.8	142.6	12.2	9	200.38	1566.6	141.672	1238	98.4	68.6	2725.6	367.74	2435.2	106.962	71,376	971.54	5,946	16.66	8,084	14,19	10,662	9,914	8,772				
	Total	2111.8	1811.4	170.6	129.8	5013.6	15160.4	3480.2	17270.6	1575.6	1032.8	16319.2	3706.2	18467.8	1584.2	1035.54	6893.6	0	0	0	0	0	0	0	0			
2018 AM	Complete	2080.6	1807	151.8	121.8	5045.2	15827.6	3514.4	17850.6	1387.6	998.4	0	0	0	0	6623	3,192	7,634	1,69	13,416	5,208	5,872	5,41	4,892				
	Incomplete	160	140.4	10	9.6	202.32	1510.4	143.122	1200.2	85.4	79	2759.6	361.32	2413.8	92,538	80,218	976.72	6,114	17,232	2,256	7,896	14,808	9,93	10,752	9,69			
	Total	2240.6	1947.4	161.8	131.4	5247.8	17337.8	3657.6	19050.8	1473	1077.4	18587	3876	20264.4	1480.2	1078.62	7599.8	0	0	0	0	0	0	0	0			
2028 AM	Complete	2189.2	1902.2	155.8	131.2	5153.4	19499.6	3616.6	20445.4	1565.6	1253.6	0	0	0	0	7860.4	3,598	8,926	1,652	11,236	6,574	6,528	6,094	5,822				
	Incomplete	176.6	156	11	9.6	241.26	1758	167.08	1537.8	107.4	77.6	3220.8	399.1	2887.2	113.4	81,222	1135.78	6,406	18,144	2,266	7,544	15,79	10,364	10,504	8,54			
	Total	2365.8	2058.2	166.8	140.8	5394.8	21257.6	3783.4	21983.2	1673	1331.2	22720	4015.6	23332.6	1679	1334.6	8995.8	0	0	0	0	0	0	0	0			

9:00 - 9:15

	Measured Totals													Estimated Totals					Resultant Derived Averages (per vehicle)									
	All				Cars			Light			Heavy			Time	Distance	Cars	Light	Heavy	Total		Trip Time	Distance	Speed	Delay		Cars	Light	Heavy
	Freeflow	Trip Time	Distance	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy					
Existing	Complete	882.2	763.8	63.6	54.8	2298	5825.4	1591	7323.8	577	395	0	0	0	2584.8	2,93	6,602	1,804	16,762	3,998	5,318	5,068	4,02					
	Incomplete	95.4	81.8	8	5.6	114.486	637.9	84,704	703.8	65.8	50.4	1378.26	235.08	1508.46	73,332	52,338	531.8	5,314	13,662	2,474	11,97	11,062	9,124	9,172	9,418			
	Total	977.6	845.6	71.6	60.4	2412.4	6463.2	1676	8027.6	642.8	445.4	7203.8	186.08	8832.4	650.34	447.32	3116.4	0	0	0	0	0	0	0	0	0		
2013 AM	Complete	1002.2	879.8	72.8	49.6	2592.6	9491.4	1805.4	10006.8	794.4	514.2	0	0	0	3813.2	3,806	9,446	1.8	11,47	6,862	6,318	6,07	5,772					
	Incomplete	128.8	113	8.4	7.4	134.84	1471.4	99,802	1221.2	85.8	68.6	2919.4	297.7	2573.4	95,368	65,86	1006.28	7,822	22,688	2,314	6,128	20,104	13,994	13,704	12,072			
	Total	1131	992.8	81.2	57	2727.6	10963	1905.4	11228	880.2	582.8	12410.8	2103.4	12580.2	889.76	580.06	4819.4	0	0	0	0	0	0	0	0			
2018 AM	Complete	1051.8	927	66.2	58.6	2583.6	9675.2	1809.4	9939.2	676.6	489.4	0	0	0	3816.2	3,618	9,164	1,722	11,41	6,708	6,226	5,894	4,828					
	Incomplete	129.8	118.2	7.2	4.4	137.46	1377.4	99.6	1142.6	92.8	41.8	2831.8	300.76	2512.4	96,846	39,052	971.88	7,484	21,792	2,316	6,402	19,336	12,712	17,306	13,926			
	Total	1181.6	1045.2	73.4	63	2721	11052.8	1908.8	11081.8	769.4	531.2	12506.8	2109.6	12451.6	773.46	528.46	4788	0	0	0	0	0	0	0	0			
2028 AM	Complete	1170.6	1028.2	80.4	62	2902.2	11647.2	2026.2	11613.4	896.6	599.6	0	0	0	4559.2	3,882	9,912	1,732	10,624	7,436	6,496	6,494	5,426					
	Incomplete	131	119.8	6.4	4.8	144.96	1355	105,556	1202.4	66.2	45.4	2795.6	299.4	2585.6	69,232	48,834	964.22	7,36	21,346	2,284	6,43	18,866	12,574	12,778	12,028			
	Total	1301.6	1148	86.8	66.8	3047	13001.8	2131.8	12815.8	962.8	645	14442.8	2325.4	14199	965.72	648.46	5523.4	0	0	0	0	0	0	0	0			

9:15 - 9:30

	Measured Totals													Estimated Totals					Resultant Derived Averages (per vehicle)									
	All				Cars			Light			Heavy			Time	Distance	Cars	Light	Heavy	Total		Trip Time	Distance	Speed	Delay		Cars	Light	Heavy
	Freeflow	Trip Time	Distance	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy					
Existing	Complete	1746.4	1511	127.4	108	4522.6	10591.4	3133	12809.2	1020.4	721.6	0	0	0	4719	2,7	6,054	1,794	18,356	3,466	4,712	4,544	3,744					
	Incomplete	72	58.6	6.4	7	113,404	373,694	79,468	439.2	39.6	38.6	721.24	173,436	898.8	43,104	38,712	302.9	3,748	8,852	2,392	18,576	6,264	6,076	4,75	4,526			
	Total	1818.4	1569.6	133.8	115	4635.8	10964.8	3212.4	13248.4	1060	760.2	11312.4	3306.8	13708	1063.5	760.32	5021.8	0	0	0	0	0	0	0	0			
2013 AM	Complete	1936.6	1687.4	144	105.2	4900.6	17451.6	3413	18566.6	1391.6	993.2	0	0	0	7044.6	3,64	9,012	1,764	11,756	6,482	6,246	5,5	5,398					
	Incomplete	130.8	113.8	9	8	138.86	1420	102,088	1137.4	110.6	77.6	2931.2	308.72	2533.2	122,526	82,514	1022.18	7,814	22,402	2,364	6,372	19,872	12,78	16,272	11,83			
	Total	2067.4	1801.2	153	113.2	5039.6	18871.6	3514.8	19704	1502.2	1070.8	20382.6	3721.6	21099.8	1514.2	1075.76	8066.8	0	0	0	0	0	0	0	0			
2018 AM	Complete	2049	1799.8	135	114.2	4993.6	17642.2	3490.8	18285.8	1293	932	0	0	0	7044.6	3,438	8,602	1,704	11,984	6,164	5,964	5,62	4,77					
	Incomplete	123.6	110.2	6.4	7	141.56	1218.8	103,098	1019.2	62.8	51.4	2499.6	290.9	2244.2	68,43	54,122	868.76	7,016	20,186	2,356	7,022	17,748	10,97	11,646	8,36			
	Total	2172.6	1910	141.4	121.2	5135.2	18861	3594.2	19305	1355.8	983.4	20141.4	3781.8	21099.8	1361.4	986.2	7913.6	0	0	0	0	0	0	0	0			
2028 AM	Complete	2276.6	2008.4	152.4	115.8	5471.6	20296	3829.4	20898.2	1464.2	986	0	0	0	8012.6	3,512	8,898	1,682	11,458	6,498	6,172	5,736	4,976					
	Incomplete	132	118.8	7.6	5.6	143.14	1153.8	104,634	1160.8	89.2	52	2625	309.52	2629.2	94,45	51,182	934.4	7,072	19,87	2,348	7,094	17,468	12,346	15,272	11,642			
	Total	2408.6	2127.2	160	121.4	5614.6	21449.6	3934	22059	1553.4	1038	22921.2	4139	23527.4	<													

appendix

9:30 - 9:45

	Measured Totals											Estimated Totals					Resultant Derived Averages (per vehicle)								
					Freeflow	Trip Time	Distance				Time	Distance				Total			Trip Time	Distance	Speed	Delay			
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy	
Existing	841.4	722.2	61	58.2	2191.2	3678.2	1515.2	3823.8	299.6	271.2	0	0	0	0	0	1696	2,002	4.344	1.8	26.824	1.74	2.9	2.644	2.53	
Complete	45.4	37.8	3.4	4.2	82.482	130.826	57.826	172.2	14.4	14.8	296.34	112.514	335.264	16.176	16.312	132.02	2.69	6.056	2.48	26.596	3.452	3.142	2.928	2.346	
Incomplete	886.8	760	64.4	62.4	2273.6	3808.8	1572.8	3996	314	286	3974.2	1628	4159.4	315.784	287.52	1828	0	0	0	0	0	0	0	0	0
Total																									
2013 AM	903.6	777.4	67.8	58.4	2275.2	7317.6	1580	7760.4	728	540.4	0	0	0	0	0	3070.6	3.408	8.12	1.752	13.056	5.602	5.708	6.062	5.246	
Complete	108.8	96.4	5.8	6.6	117.032	1195.84	88.074	820.6	55.4	63.8	2443	252.66	1814	55.55	66.432	819.34	7.502	22.38	2.32	6.234	19.862	10.43	10.23	12.564	
Incomplete	1012.4	873.8	73.6	65	2392.2	8513.2	1668.2	8581	783.4	604.2	9760	1832.6	9574.4	783.56	606.84	3890	0	0	0	0	0	0	0	0	0
Total																									
2018 AM	986	852	74	60	2407.8	7420.2	1682.6	7888.8	598.8	435	0	0	0	0	0	3057.2	3.1	7.522	1.706	13.76	5.082	5.418	4.864	4.24	
Complete	106.2	91.2	6.4	8.6	121.72	1027.06	90.462	761.2	50.2	92.2	2265.2	249.06	1706.66	53.752	91.206	776.5	7.242	21.114	2.346	6.756	18.67	9.648	9.646	11.45	
Incomplete	1092.2	943.2	80.4	68.6	2529.4	8446.8	1773	8650	649	527.2	9685.6	1931.8	9595.4	652.54	526.2	3833.6	0	0	0	0	0	0	0	0	
Total																									
2028 AM	1058	920.2	78.2	59.6	2510.2	7766.8	1759.4	8764.4	697.8	367.2	0	0	0	0	0	3217.4	3.044	7.352	1.664	13.728	4.982	5.72	5.368	3.674	
Complete	113.8	97.6	5.4	10.8	126.18	1049.34	92.918	891	61	117.6	2139.4	264.56	1969.6	62.518	112.514	776.04	6.798	18.748	2.332	7.476	16.374	11.134	13.884	13.088	
Incomplete	1171.8	1017.8	83.6	70.4	2636.4	8816.6	1852.6	9655.4	758.8	484.8	9906	2024	10734	760.32	479.7	3993.4	0	0	0	0	0	0	0	0	
Total																									

9:45 - 10:00

	Measured Totals											Estimated Totals					Resultant Derived Averages (per vehicle)								
					Freeflow	Trip Time	Distance				Time	Distance				Total			Trip Time	Distance	Speed	Delay			
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy	
Existing	1631	1403.2	119.8	108	4211.4	6147.8	2913.8	5539.2	442	387.2	0	0	0	0	0	2833	1,722	3.738	1.786	29.95	1.158	2.152	2.024	1.946	
Complete	34.4	30.2	2.6	1.6	66.186	72.95	45.33	40.8	4.6	1.2	152.588	80.414	112.106	4.738	1.54	66.084	1.9	4.378	2.336	32.422	1.798	1.008	1.724	0.638	
Incomplete	1665.4	1433.4	122.4	109.6	4277.4	6220.4	2959	5580	446.6	388.4	6300.2	2994.2	5651.2	446.74	388.72	2899.2	0	0	0	0	0	0	0	0	
Total																									
2013 AM	1822.8	1569.2	138	115.6	4532.4	13646.6	3161	14540.2	1301.4	994.8	0	0	0	0	0	5763.6	3.16	7.486	1.736	13.972	5.002	5.346	5.398	4.956	
Complete	89.6	75	6.8	7.8	107.886	886.38	80.622	564.8	68	78.2	1948.2	216.22	1266.8	71.872	83.97	663.92	7.362	21.596	2.418	6.844	19.11	8.316	11.036	10.782	
Incomplete	1912.4	1644.2	144.8	123.4	4640.4	14533.2	3241.8	15105	1369.4	1073	15595	3377.2	15807	1373.28	1078.7	6427.8	0	0	0	0	0	0	0	0	
Total																									
2018 AM	1970	1697.8	147	125.2	4781.8	13898.8	3351.4	14488.2	1194.6	907.4	0	0	0	0	0	5809.2	2,944	7.046	1.7	14.706	4.616	5.014	4.798	4.282	
Complete	87.2	71.6	8.8	6.8	104.926	688.74	78.442	530.2	73.4	61.2	1695	208.26	1207.52	79.716	67.186	591.44	6.632	19.022	2.388	7.99	16.592	8.088	8.646	8.678	
Incomplete	2057.2	1769.4	155.8	132	4886.8	14587.4	3430	15018.4	1268	968.6	15594	3559.4	15695.8	1274.42	974.74	6400.4	0	0	0	0	0	0	0	0	
Total																									
2028 AM	2072.2	1792.4	152.2	127.6	4856	14864.4	3414.8	16004.6	1325.2	980	0	0	0	0	0	6220.2	3,008	7.182	1.648	14	4.838	5.414	5.306	4.638	
Complete	101	94	4	3	111.32	919.76	84.522	809.6	26.4	28.4	2019.2	242.66	1837	29.492	30.548	693.84	6.814	19.842	2.402	7.45	17.502	10.266	7.326	10.32	
Incomplete	2173.2	1886.4	156.2	130.6	4967.6	15784.4	3499.2	16814.2	1351.6	1008.4	16883.8	3657.6	17841.6	1354.6	1010.58	6914	0	0	0	0	0	0	0	0	
Total																									

appendix

16:00 - 18:00

	Measured Totals												Estimated Totals						Resultant Derived Averages (per vehicle)								
	Count				Freeflow	Triptime	Distance				Time	Distance				Total											
	All	Cars	Light	Heavy	(min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	Trip Time	Distance	Speed	Delay	h)					
	(min)	(min)	(min)	(min)	(min)	(min)	(km)	(min)	(min)	(min)	(min)	(km)	(min)	(min)	(min)	(min)	(min)	(min)	(min)	(min)	(min)	(min)	(min)				
Existing	Complete	12539.2	10863.8	953.2	722.2	30051	52289.2	20639	45042.2	3671.2	2533.2	0	0	0	0	22656.8	1.795	4.1405	1.64225	25.5035	1.74875	2.46425	2.304	2.07875			
	Incomplete	648.6	558.2	45.2	45.2	659.12	2462.99	449.63	2123.2	156.2	150.2	6091.14	1538.254	5130.4	176.868	161.402	2309.712	3.31925	8.5795	2.367	19.34975	6.18725	5.378	5.224	4.79675		
	Total	13187.8	11422	998.4	767.4	30710	54751.4	21088.8	47165.4	3827.4	2683.4	58381	22177.4	50172.6	3848.02	2694.6	24966.8	0	0	0	0	0	0	0	0		
2013 AM	Complete	13412.2	11661.2	986.8	764.2	31212.6	67725.8	21528.6	58573.4	4552.2	2764.2	0	0	0	0	27859.2	2.05225	4.9855	1.59975	20.82275	2.66575	3.03775	2.80425	2.186			
	Incomplete	854.6	755	57.8	41.8	810.424	4216.12	555.404	3141.8	206.2	124	10392.04	2033.68	8280.96	238.222	129.348	3697.06	4.1615	11.58675	2.37775	14.2995	9.26775	6.468	5.56825	3.945		
	Total	14266.8	12416.2	1044.6	806	32023.4	71942	22083.8	61715.2	4758.4	2888.2	78118.2	23562.4	66854.6	4790.44	2893.48	31557	0	0	0	0	0	0	0	0		
2018 AM	Complete	14519.4	12729.4	1044.4	745.6	33099.2	82177.6	22866.8	75086.6	5055	3185	0	0	0	0	33093.8	2.25525	5.59825	1.57275	18.767	3.32325	3.62575	2.999	2.618			
	Incomplete	1047.6	940.8	61.4	45.4	1145.982	6221.88	776.382	4752.4	286	189	13945.04	2447.48	11845.78	310.212	191.132	4944.14	4.51525	12.61425	2.3335	13.05725	10.33775	6.68525	5.90325	5.51575		
	Total	15567	13670.2	1105.8	791	34245	88399.8	23643.8	79839	5341	3374	96123	25314.2	86932.6	5365.34	3376.16	38037.8	0	0	0	0	0	0	0	0		
2028 AM	Complete	7236.6	6297	528.6	411	14782.22	41435.7	10341.61	37043.8	2629.6	1848	0	0	0	0	16456.8	1.4005	3.5125	0.98	14.2595	2.089	2.542	1.956	1.7185			
	Incomplete	1788.2	1573	115.2	100	1991.98	64216.8	1359.962	8929.4	620.8	457.6	15045.98	1812.4	9673.2	273.618	182.604	4910.98	2.88475	8.57675	1.21225	7.13375	7.1525	7.00125	5.7465			
	Total	9024.8	7870	643.8	511	16774.52	105652.8	11701.84	45973.2	3250.4	2305.6	56481.72	12153.57	46717.08	2903.124	2030.562	21367.92	0	0	0	0	0	0	0	0		

16:30 - 17:30

	Measured Totals												Estimated Totals						Resultant Derived Averages (per vehicle)								
	Count				Freeflow	Triptime	Distance				Time	Distance				Total											
	All	Cars	Light	Heavy	(min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	Trip Time	Distance	Speed	Delay	h)					
	(min)	(min)	(min)	(min)	(min)	(min)	(km)	(min)	(min)	(min)	(min)	(km)	(min)	(min)	(min)	(min)	(min)	(min)	(min)	(min)	(min)	(min)	(min)	(min)			
Existing	Complete	6474	5582.6	500.2	391.2	15814.2	26895.6	10843.8	24668.2	2044.8	1524.4	0	0	0	0	11926.4	1.8335	4.1215	1.8755	24.931	1.6765	2.6145	2.458	2.3085			
	Incomplete	333	286.4	23.6	23	345.772	1213.74	236.11	1120.4	85.4	83.2	2864.8	792.9	2597.64	95.014	90.714	1123.38	3.267	8.228	2.3795	18.293	5.783	5.4645	5.4265	5.0035		
	Total	6807	5869	523.8	414.2	16160.2	28109	11079.8	25788.6	2130.2	1607.6	2970.4	11636.6	27265.6	2139.8	1615.12	13050.2	0	0	0	0	0	0	0	0		
2013 AM	Complete	6954.4	6036.2	500.4	417.8	16426.4	37661.8	11316.8	33624	2639.6	1791.4	0	0	0	0	15523.2	2.2175	5.367	1.625	18.478	3.007	3.3945	3.21	2.643			
	Incomplete	469.8	415.4	32.6	21.8	435.578	2480.12	296.96	1762.2	106.6	65.2	5974.84	1111.26	4790.48	127.984	69.782	2109.54	4.4275	12.475	2.3675	11.812	10.1155	6.689	5.2205	4.4015		
	Total	7424.2	6451.6	533	439.6	16861.8	40142.6	11615.8	35386.2	2746.2	1856.6	43637.4	12428.2	38414.6	2767.66	1861.16	17632.6	0	0	0	0	0	0	0	0		
2018 AM	Complete	7461.6	6519	541.4	401.2	17214.2	45063.6	11878.2	42191	3011	2003	0	0	0	0	18208	2.428	6.005	1.5935	16.1925	3.697	4.0195	3.462	3.0585			
	Incomplete	587.8	529.8	31.8	26.2	647.138	3713.38	437.132	2802	152.2	112.8	8055.08	1361.94	6918.18	169.194	116.92	2848.14	4.795	13.513	2.3215	10.6225	11.2035	7.0435	5.689	5.728		
	Total	8049.4	7048.8	573.2	427.4	17861.2	48777	12315.8	44993	3163.2	2115.8	53118.8	13240.2	49109.2	3180.36	2119.94	21056	0	0	0	0	0	0	0	0		
2028 AM	Complete	2941.8	2576	205.8	160	6206.024	19050.3	4342.412	17113.6	1175	766	0	0	0	0	7432.204	1.554	3.9275	1.126	14.962	2.271	2.8645	1.9655	1.627			
	Incomplete	971	856.2	60.2	54.6	1035.36	28914.18	703.074	4797.8	316.4	242.6	9502.8	966.6	5332.2	112.614	74.846	2978.76	3.233	10.1655	1.0985	4.869	8.509	7.7255	7.23	5.7815		
	Total	3912.8	3432.2	266	214.6	7241.48	47964.8	5045.76	21911.4	1491.4	1008.6	28553.12	5308.972	22445.88	1287.564	840.842	10410.92	0	0	0	0	0	0	0	0		

16:00 - 16:15

	Measured Totals												Estimated Totals						Resultant Derived Averages (per vehicle)								
	Count				Freeflow	Triptime	Distance				Time	Distance				Total											
	All	Cars	Light	Heavy	(min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	Trip Time	Distance	Speed	Delay	h)					
	(min)	(min)	(min)	(min)	(min)	(min)	(km)	(min)	(min)	(min)	(min)	(km)	(min)	(min)	(min)	(min)	(min)	(min)	(min)	(min)	(min)	(min)	(min)	(min)			
Existing	Complete	963.8	841.4	68	54.4	2030.2	2411.2	1410	1704.4	137.6	99.4	0	0	0	0	1117.2	1.16	2.504	1.464	35.124	0.394	1.386	1.384	1.252			
	Incomplete	55.4	48	3.2	4.2	75.922	113.606	51.454	114.8	9.6	8.6	247.06	127.97	187.96	10.166	8.834	109.848	1.976	4.436	2.308	31.268	2.326	2.552	4.294	2.256		
	Total	1019.2	889.4	71.2	58.6	2106	2524.4	1461.6	1819.2	147.2	108	2658	1538	1892.6	147.76	108.22	1227	0	0	0	0	0	0	0	0		
2013 AM	Complete	1047.8	901.6	83.8	62.4	2122.2	2661.8	1477.8	1993.8	176.2	125.4	0	0	0	0	1233.4	1.178	2.54	1.412	33.334	0.514	1.566	1.49	1.42			
	Incomplete	70.8	61.2	4	5.6	90.294	155.38	61.774	178.4	11.4	13	345.76	165.08	294.66	10.494	13.866	151.98	2.146	4.872	2.324	28.642	2.848	3.38	3.246	2.698		
	Total	1118.6	962.8	87.8	68	2212.6	2817.2	1539.8	2172.2	187.6	138.4	3007.6	1643.2	2288.6	186.7	139.24	1385.8	0	0	0	0	0	0	0	0		
2018 AM	Complete	1138	982	92.6	63.4	2234	2874	1562	2385.4	192.4	143.6	0	0	0	0	1342.2	1.182	2.526	1.374	32.64	0.562	1.766	1.518	1.654			
	Incomplete	78.6	66.4	6.4	5.8	91.158	178.42	62.844	224.2	18.2	17.4	382.9	172.22	354.68	18.57	18.012	170.3	2.166	4.874	2.2	27.068	2.908	4.242	3.9	4.126		
	Total	1216.6	1048.4	99	69.2	2325.4	3052.4	1624.8	2609.6	210.6	161	3256.8	1734.2	2740.2	210.96	161.62	1512.4	0	0	0	0	0	0	0	0		
2028 AM	Complete	1201.4	1039.2	92.2	70	2290	3216	1602.6	2986.2	235.2	192.6	0	0	0	0	1503.8	1.25	2.676	1.334	29.91	0.77	2.154	1.898	2.052			
	Incomplete	108.4	93.2	8.2	7	118.7	308.14	82.188	371.8	26.6	24	620.38	232.68	601.2	28.56	24.488	264.28	2.436	5.72	2.148	22.568	3.814	5.296	4.178	4.458		
	Total	1309.8	1132.4	100.4	77	2408.6	3524.4	1684.8	3358	261.8	216.6	3836.6	1835.2	3587.4	263.76	217.1	1768.4	0	0	0	0	0	0	0	0		

16:15 - 16:30

	Measured Totals												Estimated Totals					Resultant Derived Averages (per vehicle)								
					Freeflow	Trip Time	Distance				Time	Distance				Total			Trip Time	Distance	Speed	Delay (h)				
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy		
Existing	Complete	2096.4	1820.6	155.4	120.4	4657	5928	3216.4	4680.4	400	289.6	0	0	0	2750.2	1.312	2.826	1.534	32.622	0.606	1.672	1.68	1.566			
	Incomplete	55.6	43.8	5.4	6.4	68.118	116.244	46.668	133	14.6	19.8	279	129.984	237.64	15.378	18.104	126.164	2.234	4.962	2.348	28.552	2.742	3.49	3.618	3.394	
	Total	2152	1864.4	160.8	126.8	4725.2	6044	3263.2	4813.4	414.6	309.4	6207.4	3346.8	4918	415.38	307.7	2876.4	0	0	0	0	0	0	0	0	
2013 AM	Complete	2219	1906.4	173.6	139	4775.2	7427.2	3312.2	6483.8	565.8	403.6	0	0	0	0	3342.8	1.504	3.35	1.492	26.8	1.196	2.278	2.182	1.946		
	Incomplete	92.6	78.4	6.6	7.6	122.006	364.26	82.226	403	39.8	31.8	689.64	218.64	667.58	41.85	31.574	288.22	3.078	7.376	2.366	19.332	5.224	6.928	4.57		
	Total	2311.6	1984.8	180.2	146.6	4897.4	7791.2	3394.4	6886.8	605.6	435.4	8116.4	3530.8	7151.4	607.66	435.16	3631.4	0	0	0	0	0	0	0	0	
2018 AM	Complete	2392.6	2070.8	185	136.8	4956.2	8247.8	3452.8	7528.2	641.6	472.6	0	0	0	0	3691.8	1.544	3.446	1.444	25.164	1.376	2.52	2.408	2.394		
	Incomplete	108	91.4	9.4	7.2	147.898	476.84	99.68	537.4	52.8	35.2	866.66	257.72	875.32	54.914	33.498	358.72	3.31	8.006	2.384	17.91	5.932	6.368	6.286	4.966	
	Total	2500.6	2162.2	194.4	144	5104.2	8725	3552.4	8065.6	694.4	507.8	9114.8	3710.6	8403.6	696.5	506.1	4050.4	0	0	0	0	0	0	0	0	
2028 AM	Complete	2415.8	2085.6	186.4	143.8	4867	9375.6	3402.2	8949.2	733	565	0	0	0	0	4106.2	1.696	3.87	1.41	21.892	1.858	3.034	2.788	2.766		
	Incomplete	164.6	142.8	12.4	9.4	220.48	1080.28	147.02	958.6	75	58.8	1724.4	367.4	1529.2	73.964	59.182	653.34	3.934	10.336	2.24	13.172	8.32	7.498	7.064	7.036	
	Total	2580.4	2228.4	198.8	153.2	5087.6	10455.6	3549.2	9907.8	808	623.8	11100	3769.4	10478.4	807	624.18	4759.4	0	0	0	0	0	0	0	0	

16:30 - 16:45

	Measured Totals												Estimated Totals					Resultant Derived Averages (per vehicle)								
					Freeflow	Trip Time	Distance				Time	Distance				Total			Trip Time	Distance	Speed	Delay (h)				
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy		
Existing	Complete	1075.4	916.8	90	68.6	2563.8	3702.4	1761.4	3513.2	335.6	243.2	0	0	0	0	1740.2	1.616	3.444	1.638	28.68	1.058	2.34	2.284	2.118		
	Incomplete	61.2	52	4.8	4.4	76.278	157.44	52.168	173.4	13.6	17.8	370.72	144.86	367.64	15.928	19.092	161.24	2.62	6	2.364	23.896	3.616	4.044	3.444	4.862	
	Total	1136.6	968.8	94.8	73	2640	3859.8	1813.6	3692.6	349.2	261	4073.2	1906.4	3880.8	351.5	262.3	1901.6	0	0	0	0	0	0	0	0	
2013 AM	Complete	1153.4	997.6	78.4	77.4	2691.4	5233.6	1852.4	5056.6	377	335.4	0	0	0	0	2284	1.976	4.528	1.604	21.316	2.196	3.148	2.984	2.698		
	Incomplete	97	85.8	5.8	5.4	101.77	403.26	69.542	370.8	24.4	16.8	910.04	225.36	851.96	27.882	19.84	348.2	3.59	9.364	2.328	15.06	7.03	6.072	5.478	4.216	
	Total	1250.4	1083.4	84.2	82.8	2793.2	5636.8	1921.6	5427.4	401.4	352.2	6143.8	2077.4	5908.6	404.9	355.24	2632	0	0	0	0	0	0	0	0	
2018 AM	Complete	1267.6	1090.6	96.6	80.4	2882.6	6504.4	1989	6355.6	546.2	407.6	0	0	0	0	2783.6	2.194	5.126	1.568	18.452	2.854	3.704	3.586	3.218		
	Incomplete	121	103.2	8.8	9	149.3	618.38	100.75	566.4	59.8	40.6	1312.08	283.18	1208.18	63.31	44.282	502.32	4.136	10.768	2.34	13.098	8.496	6.534	8.064	5.678	
	Total	1388.6	1193.8	105.4	89.4	3032.2	7122.6	2089.8	6922	606	448.2	7816.2	2272	7563.8	609.52	451.86	3286	0	0	0	0	0	0	0	0	
2028 AM	Complete	672	584.2	48.8	39	1461.48	3893.24	1020.07	3786.6	286.8	192.4	0	0	0	0	1594.46	1.982	4.812	1.61	21.582	2.46	2.982	2.644	2.184		
	Incomplete	222.8	193.8	14.4	14.6	245.6	3100.6	164.54	1153	76.8	65.4	2002	273.096	1415.936	38.854	34.266	673.7	3.264	9.576	1.348	8.656	7.224	8.102	6.87	6.296	
	Total	894.8	778	63.2	53.6	1707.18	6994	1184.64	4939.6	363.6	257.8	5895.44	1292.96	5202.6	325.634	226.66	2268.36	0	0	0	0	0	0	0	0	

16:45 - 17:00

	Measured Totals												Estimated Totals					Resultant Derived Averages (per vehicle)								
					Freeflow	Trip Time	Distance				Time	Distance				Total			Trip Time	Distance	Speed	Delay (h)				
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy		
Existing	Complete	2160.4	1853	171	136.4	5146.4	7757.8	3536.4	7417.8	639.2	494.2	0	0	0	0	3590.8	1.664	3.594	1.636	27.426	1.21	2.448	2.284	2.198		
	Incomplete	72.8	64.2	4.8	3.8	89.66	248.34	60.32	258	22.4	14.8	527.04	173.7	513.66	24.348	15.97	217.14	2.994	7.276	2.386	19.87	4.894	4.892	5.984	3.842	
	Total	2233.2	1917.2	175.8	140.2	5236.4	8006.2	3596.6	7675.8	661.6	509	8284.8	3709.8	7931.2	663.54	510.16	3808.2	0	0	0	0	0	0	0	0	
2013 AM	Complete	2340	2019	167.6	153.4	5448.2	11481.2	3750.4	10540.4	865	660	0	0	0	0	4880.8	2.084	4.9	1.604	19.676	2.574	3.254	3.218	2.682		
	Incomplete	111.4	96.4	7.4	7.6	81.794	491.58	56.572	324.2	19.6	24.8	1280.4	266.42	1036.72	25.508	27.532	463.78	4.168	11.51	2.394	12.502	9.182	6.626	5.75	5.906	
	Total	2451.4	2115.4	175	161	5530	11973	3807.2	10864.6	884.6	684.8	12761.8	4017	11577.2	890.62	687.54	5344.8	0	0	0	0	0	0	0	0	
2018 AM	Complete	2529.2	2185.4	191.2	152.6	5711.6	13668.2	3939.8	12985.4	1085.2	809.4	0	0	0	0	5734.4	2.266	5.398	1.558	17.39	3.144	3.81	3.644	3.366		
	Incomplete	135.8	123.4	6.6	5.8	129.2	775.22	88.028	557.4	21.4	22.6	1733.2	315.44	1499.4	26.1	24.716	616.12	4.556	12.832	2.326	10.972	10.572	6.974	6.474	7.056	
	Total	2665	2308.8	197.8	158.4	5840.8	14443.4	4028	13542.8	1106.6	832	15401.4	4255.4	14484.8	1111.4	834.18	6350.6	0	0	0	0	0	0	0	0	
2028 AM	Complete	1228	1074.8	85.2	68	2712.3	7879.38	1878.43	7514.6	510.4	351.6	0	0	0	0	3140.9	2.022	4.984	1.62	21.298	2.61	2.986	2.536	2.182		
	Incomplete	219.6	193.8	13.4	12.4	216.02	5395.98	145.694	950.8	67.2	56	2814.8	260.784	1239.664	28.142	23.7	853.66	4.114	13.228	1.37	6.084	7.414	6.71	6.276		
	Total	1447.6	1268.6	98.6	80.4	2928.26	13275.4	2024.28	8465.4	577.6	407.6	10694	2139.3	8754.28	538.53	375.282	3994.52	0	0	0	0	0	0	0	0	

appendix

17:00 - 17:15

	Measured Totals											Estimated Totals					Resultant Derived Averages (per vehicle)									
					Freeflow	Trip Time	Distance			Time			Distance		Total			Trip Time			Distance		Speed		Delay	
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy		
Existing	Complete	1077.6	935	80.4	62.2	2710.8	4955.8	1853.8	4474.2	374.8	264.4	0	0	0	0	2151.6	1998	4.598	1.72	22.466	2.082	2.782	2.698	2.45		
	Incomplete	97	84.2	5.4	7.4	92.878	360.58	63.742	326.2	23.4	23.6	877.56	229.4	802.2	24.412	25.414	339.24	3.488	9.012	2.364	15.74	6.496	5.888	7.072	4.9	
	Total	1174.6	1019.2	85.8	69.6	2803.6	5316.2	1917.6	4800.4	398.2	288	5833.2	2083.2	5276.4	399.22	289.8	2490.8	0	0	0	0	0	0	0	0	0
2013 AM	Complete	1139.2	988.6	84.6	66	2703.2	6739	1866.2	5669.4	455.2	298	0	0	0	0	2704.4	2,374	5.92	1.636	16.654	3.546	3.502	3.29	2.73		
	Incomplete	137.4	123.4	9.4	4.6	138.266	847.76	95.32	572.2	36.6	16.2	1938.2	319.9	1503.8	41.268	13.628	667.84	4.884	14.182	2.334	9.9	11.81	6.762	5.706	4.19	
	Total	1276.6	1112	94	70.6	2841.4	7587	1961.6	6241.6	491.8	314.2	8677.4	2186.2	7173.2	496.46	311.6	3372.4	0	0	0	0	0	0	0	0	0
2018 AM	Complete	1216	1073.6	86.8	55.6	2867	8039.4	1977	7203.6	453.2	259.4	0	0	0	0	3135.8	2,578	6.612	1.626	14.774	4.256	4.122	3.226	2.794		
	Incomplete	167.2	151.8	8	7.4	186.32	1109.62	125.7	838.2	27.6	34.6	2368.4	377.72	2001.4	31.866	32.836	824.78	4.948	14.242	2.26	9.634	11.884	7.33	4.164	5.586	
	Total	1383.2	1225.4	94.8	63	3053.2	9149	2103	8041.8	480.8	294	10408	3254.8	9205	485.04	292.22	3960.6	0	0	0	0	0	0	0	0	0
2028 AM	Complete	409.4	360.6	28.2	20.6	804.522	2681.74	570.156	2014	136.2	71	0	0	0	0	990.022	1,072	2.872	0.638	8.624	1.92	2.624	1.3	0.98		
	Incomplete	261.6	231.6	16.4	13.6	280.86	8441.2	192.8	1240.2	84.8	58	1774.4	208.44	1156.2	24.714	7.914	572	2,262	7.01	0.828	2.832	6.06	7.302	7.256	4.89	
	Total	671	592.2	44.6	34.2	1085.42	11122.8	763.02	3254.2	221	129	4455.94	778.556	3170.2	160.92	78.92	1561.822	0	0	0	0	0	0	0	0	0

17:15 - 17:30

	Measured Totals											Estimated Totals					Resultant Derived Averages (per vehicle)									
					Freeflow	Trip Time	Distance			Time			Distance		Total			Trip Time			Distance		Speed		Delay	
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy		
Existing	Complete	2160.6	1877.8	158.8	124	5393.2	10479.6	3692.2	8263	695.2	522.6	0	0	0	0	4443.8	2,056	4.85	1.708	21.152	2.356	2.888	2.586	2.468		
	Incomplete	102	86	8.6	7.4	86.956	447.38	59.88	356.8	26	27	1089.48	244.94	914.14	30.326	30.238	405.76	3.966	10.624	2.404	13.664	8.126	7.034	5.206	6.41	
	Total	2262.6	1963.8	167.4	131.4	5480.2	10926.8	3752	8619.8	721.2	549.6	11569.2	3937.2	10177.2	725.54	552.86	4849.6	0	0	0	0	0	0	0	0	0
2013 AM	Complete	2321.8	2031	169.8	121	5583.6	14208	3847.8	12357.6	942.4	498	0	0	0	0	5654	2,436	6.12	1.656	16.266	3.712	3.674	3.348	2.462		
	Incomplete	124	109.8	10	4.2	113.748	737.52	77.526	495	26	7.4	1846.2	299.58	1398	33.326	8.782	629.72	5.068	14.844	2.414	9.786	12.44	7.296	3.948	3.294	
	Total	2445.8	2140.8	179.8	125.2	5697.2	14945.8	3925.4	12852.6	968.4	505.4	16054.4	4147.6	13755.6	975.68	506.78	6283.4	0	0	0	0	0	0	0	0	0
2018 AM	Complete	2448.8	2169.4	166.8	112.6	5753	16851.6	3972.4	15646.4	926.4	526.6	0	0	0	0	6554.2	2,674	6.884	1.622	14.154	4.534	4.442	3.392	2.856		
	Incomplete	163.8	151.4	8.4	4	182.318	1210.16	122.654	840	43.4	15	2641.4	385.6	2209.2	47.918	15.086	904.92	5.54	16.21	2.36	8.786	13.862	7.336	5.854	4.592	
	Total	2612.6	2320.8	175.2	116.6	5935	18062	4095	16486.4	969.8	541.6	19493.2	4358	17855.6	974.4	541.68	7458.8	0	0	0	0	0	0	0	0	0
2028 AM	Complete	632.4	556.4	43.6	32.4	1227.722	4595.94	873.756	3798.4	241.6	151	0	0	0	0	1706.822	1,14	3.042	0.636	8.344	2.094	2.866	1.382	1.162		
	Incomplete	267	237	16	14	292.88	11976.4	200.04	1453.8	87.6	63.2	2911.6	224.28	1520.4	20.904	8.966	879.4	3,292	10.848	0.848	1.904	9.898	8.084	8.084	5.664	
	Total	899.4	793.4	59.6	46.4	1520.62	16572.6	1073.82	5252.2	329.2	214.2	7507.74	1098.156	5318.8	262.48	159.98	2586.222	0	0	0	0	0	0	0	0	0

17:30 - 17:45

	Measured Totals											Estimated Totals					Resultant Derived Averages (per vehicle)									
					Freeflow	Trip Time	Distance			Time			Distance		Total			Trip Time			Distance		Speed		Delay	
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy		
Existing	Complete	1006.4	878	75.6	52.8	2523.6	5617.8	1728.6	4640.8	367	210.8	0	0	0	0	2273.6	2,258	5.584	1.716	18.492	3.076	3.078	2.82	2.29		
	Incomplete	100.6	88	7.4	5.2	77.112	518.88	52.54	357.6	27.6	16.4	1362.4	238.44	1036.2	34.194	18.586	476.12	4.726	13.518	2.368	10.556	11.008	7.832	6.78	7.162	
	Total	1107	966	83	58	2600.4	6136.8	1781.2	4998.4	394.6	227.2	6980.6	1967	5677	401.18	229.4	2749.8	0	0	0	0	0	0	0	0	0
2013 AM	Complete	1072.2	949	76	47.2	2640.4	6741	1814	5534.6	368.4	143	0	0	0	0	2604.2	2,43	6.282	1.69	16.162	3.82	3.446	2.844	1.76		
	Incomplete	108.8	98	7.8	3	79.488	562.82	54.536	391.8	25	6.2	1644.4	265.16	1252.2	29.168	5.434	559.86	5.146	15.112	2.434	9.694	12.65	7.98	6.664	4.108	
	Total	1181	1047	83.8	50.2	2719.8	7303.8	1868.4	5926.4	393.4	149.2	8385.6	2078.8	6786.8	397.58	148.44	3164	0	0	0	0	0	0	0	0	0
2018 AM	Complete	1173	1054.4	74.2	44.4	2900.2	8826.8	1989.6	7956.4	402.6	183.6	0	0	0	0	3340.6	2,838	7.502	1.698	13.62	5.028	4.426	3.098	2.388		
	Incomplete	143.6	134.6	5.2	3.8	142.984	1028.08	96.606	662.8	21.8	16.6	2473	339.8	1987.6	22.74	15.972	831.94	5.786	17.208	2.36	8.23	14.734	7.436	6.516	6.952	
	Total	1316.6	1189	79.4	48.2	3043	9855	2086.2	8619.2	424.4	200.2	11299.8	2329.2	9944	425.34	199.58	4172.6	0	0	0	0	0	0	0	0	0
2028 AM	Complete	233.2	206.4	13.8	13	505.6	3525.8	351.4	2967	175.4	126.8	0	0	0	0	1237.2	1,062	3.024	0.302	1.196	2.59	1.908	1.686	1.294		
	Incomplete	267	235.8	17	14.2	301.56	15196.4	208.8	1340	103	60.8	1363	109.04	978.6	32.1	7.834	436.6	1,804	5.632	0.45	0.96	5.198	7.3	8.338	5.246	
	Total	500.2	442.2	30.8	27.2	807.22	18722.2	560.24	4307	278.4	187.6	4888.6	460.4	3945.6	207.4	134.64	1673.8	0	0	0	0	0	0	0	0	0

appendix

17:45 - 18:00

	Measured Totals										Estimated Totals					Resultant Derived Averages (per vehicle)								
	All	Cars	Light	Heavy	Freeflow Time (min)	Trip Time (min)	Distance (km)	Cars	Light	Heavy	Time (min)	Distance (km)	Cars	Light	Heavy	Total Cost(\$)	Cost(\$)	Trip Time (min)	Distance (km)	Speed (km/h)	Delay (min)	Cars	Light	Heavy
Existing	1998.6	1741.2	154	103.4	5026	11436.6	3440.2	9348.4	721.8	409	0	0	0	0	4589.4	2.296	5.724	1.722	18.066	3.208	3.12	2.716	2.288	
Complete	104	92	5.6	6.4	92.196	500.52	62.858	397.4	19	22.2	1337.88	248.96	1070.96	22.116	25.164	474.2	4.55	12.808	2.394	11.25	10.29	7.292	5.394	5.548
Incomplete	1998.6	1741.2	154	103.4	5026	11436.6	3440.2	9348.4	721.8	409	0	0	0	0	4589.4	2.296	5.724	1.722	18.066	3.208	3.12	2.716	2.288	
Total	2102.6	1833.2	159.6	109.8	5118.2	11937.2	3503	9745.8	740.8	431.2	12774.6	3689	10419.4	743.9	434.16	5063.4	0	0	0	0	0	0	0	0
2013 AM	2118.8	1868	153	97.8	5248.4	13234	3607.8	10937.2	802.2	300.8	0	0	0	0	5155.6	2.436	6.244	1.704	16.374	3.768	3.434	3.078	1.79	
Complete	112.6	102	6.8	3.8	83.058	653.54	57.908	406.4	23.4	7.8	1737.4	273.54	1276.04	28.726	8.692	587.46	5.212	15.434	2.428	9.48	12.958	7.902	6.824	2.578
Incomplete	2118.8	1868	153	97.8	5248.4	13234	3607.8	10937.2	802.2	300.8	0	0	0	0	5155.6	2.436	6.244	1.704	16.374	3.768	3.434	3.078	1.79	
Total	2231.4	1970	159.8	101.6	5331.8	13887.2	3665.4	11343.6	825.6	308.6	14971.2	3881.4	12213.2	830.84	309.48	5743.2	0	0	0	0	0	0	0	0
2018 AM	2354.2	2103.2	151.2	99.8	5794.6	17165.4	3984.2	15025.6	807.4	382.2	0	0	0	0	6511.2	2.766	7.292	1.692	13.942	4.832	4.216	3.12	2.274	
Complete	129.6	118.6	8.6	2.4	116.804	825.16	80.12	526	41	7	2167.4	315.8	1710	44.794	6.73	735.04	5.68	16.774	2.438	8.76	14.314	7.262	7.768	5.17
Incomplete	2354.2	2103.2	151.2	99.8	5794.6	17165.4	3984.2	15025.6	807.4	382.2	0	0	0	0	6511.2	2.766	7.292	1.692	13.942	4.832	4.216	3.12	2.274	
Total	2483.8	2221.8	159.8	102.2	5911.2	17990.4	4064.6	15551.6	848.4	389.2	19332.8	4300	16735.6	852.18	388.92	7246.4	0	0	0	0	0	0	0	0
2028 AM	444.4	389.8	30.4	24.2	913.6	6268	643	5027.8	311	197.6	0	0	0	0	2177.4	0.98	2.82	0.29	1.23	2.41	1.782	1.414	1.128	
Complete	277.2	245	17.4	14.8	315.88	18717.8	218.88	1461.2	99.8	71.4	1835.4	136.68	1232	26.38	16.254	578	1.972	6.264	0.466	0.894	5.852	7.414	7.51	6.106
Incomplete	444.4	389.8	30.4	24.2	913.6	6268	643	5027.8	311	197.6	0	0	0	0	2177.4	0.98	2.82	0.29	1.23	2.41	1.782	1.414	1.128	
Total	721.6	634.8	47.8	39	1229.62	24985.8	861.84	6489	410.8	269	8103.4	779.6	6259.8	337.4	213.8	2755.4	0	0	0	0	0	0	0	0

18:00 - 18:15

	Measured Totals										Estimated Totals					Resultant Derived Averages (per vehicle)								
	All	Cars	Light	Heavy	Freeflow Time (min)	Trip Time (min)	Distance (km)	Cars	Light	Heavy	Time (min)	Distance (km)	Cars	Light	Heavy	Total Cost(\$)	Cost(\$)	Trip Time (min)	Distance (km)	Speed (km/h)	Delay (min)	Cars	Light	Heavy
Existing	938.8	826.2	61.8	50.8	2547.2	5944.2	1724.6	4811.8	317.4	200.8	0	0	0	0	2323.2	2.476	6.228	1.838	17.742	3.514	3.168	2.728	2.11	
Complete	78.2	67	5.4	5.8	85.448	363.7	57.958	293	21.2	29.2	924.66	185.48	704.6	24.628	30.2	335.76	4.224	11.604	2.374	12.504	8.892	5.878	5.06	5.606
Incomplete	938.8	826.2	61.8	50.8	2547.2	5944.2	1724.6	4811.8	317.4	200.8	0	0	0	0	2323.2	2.476	6.228	1.838	17.742	3.514	3.168	2.728	2.11	
Total	1017	893.2	67.2	56.6	2632.4	6207.6	1782.4	5104.8	338.6	230	6769	1909.8	5516.6	342.04	230.98	2659	0	0	0	0	0	0	0	0
2013 AM	976.6	857.6	72.6	46.4	2574.8	6276	1749	4898.8	386.6	145	0	0	0	0	2438	2.498	6.426	1.792	16.728	3.79	3.188	2.934	1.714	
Complete	106	82	11.6	12.4	89.184	566.28	61.084	343.8	47.6	31	1482.6	245	917.68	54.44	34.908	510.92	4.806	13.922	2.312	10.01	11.286	7.306	6.7	4.35
Incomplete	976.6	857.6	72.6	46.4	2574.8	6276	1749	4898.8	386.6	145	0	0	0	0	2438	2.498	6.426	1.792	16.728	3.79	3.188	2.934	1.714	
Total	1082.6	939.6	84.2	58.8	2663.8	6842.6	1810	5242.6	434.2	176	7758.8	1994	5816.4	441.02	179.92	2949.4	0	0	0	0	0	0	0	0
2018 AM	1117.2	994.4	81	41.8	2898.4	7492.6	1981.8	6215.4	435.4	112.8	0	0	0	0	2879.6	2.576	6.706	1.774	15.872	4.11	3.52	2.962	1.49	
Complete	111	93	12	6	94.146	625.2	64.658	400.4	35.8	11.8	1612.6	261.4	1103	41.752	11.872	547.16	4.928	14.514	2.352	9.774	11.924	7.434	5.426	2.532
Incomplete	1117.2	994.4	81	41.8	2898.4	7492.6	1981.8	6215.4	435.4	112.8	0	0	0	0	2879.6	2.576	6.706	1.774	15.872	4.11	3.52	2.962	1.49	
Total	1228.2	1087.4	93	47.8	2992.2	8117.6	2046.6	6615.8	471.2	124.6	9105.2	2243.4	7318.4	477.16	124.666	3426.8	0	0	0	0	0	0	0	0
2028 AM	220.8	197.8	13.2	9.8	521	3536.6	357.8	2551.8	147.2	105.2	0	0	0	0	1199.8	1.086	3.204	0.324	1.214	2.732	1.592	1.376	1.324	
Complete	270.2	238.6	17	14.6	306.06	21731.4	212.16	1432.4	93.2	76.6	1455.2	116.18	949.2	20.1	21.6	461.4	1.788	5.64	0.45	0.958	5.168	7.616	7.278	7.26
Incomplete	220.8	197.8	13.2	9.8	521	3536.6	357.8	2551.8	147.2	105.2	0	0	0	0	1199.8	1.086	3.204	0.324	1.214	2.732	1.592	1.376	1.324	
Total	491	436.4	30.2	24.4	827.22	25268	570.04	3984.2	240.4	181.8	4991.8	474	3501	167.3	126.8	1661.2	0	0	0	0	0	0	0	0

18:15 - 18:30

	Measured Totals										Estimated Totals					Resultant Derived Averages (per vehicle)								
	All	Cars	Light	Heavy	Freeflow Time (min)	Trip Time (min)	Distance (km)	Cars	Light	Heavy	Time (min)	Distance (km)	Cars	Light	Heavy	Total Cost(\$)	Cost(\$)	Trip Time (min)	Distance (km)	Speed (km/h)	Delay (min)	Cars	Light	Heavy
Existing	1779.4	1551.8	127.4	100.2	4802.2	10516.4	3248	8553.4	646.6	442	0	0	0	0	4257.6	2.392	5.91	1.826	18.598	3.214	3.018	2.756	2.396	
Complete	48.4	40.4	4	4	75.562	191.74	50.03	172.2	18.4	12.6	446.08	118.04	340.14	19.324	13.278	170.32	3.512	9.158	2.444	16.72	6.46	4.5	3.136	3.472
Incomplete	1779.4	1551.8	127.4	100.2	4802.2	10516.4	3248	8553.4	646.6	442	0	0	0	0	4257.6	2.392	5.91	1.826	18.598	3.214	3.018	2.756	2.396	
Total	1827.8	1592.2	131.4	104.2	4877.6	10708	3297.8	8725.6	664	454.6	10962.4	3366	8893.6	665	455.26	4427.8	0	0	0	0	0	0	0	0
2013 AM	1868.8	1619.4	148.4	101	4866.4	11755.6	3305.6	8867.4	824.2	522.2	0	0	0	0	4672.8	2.5	6.29	1.77	16.89	3.686	3.094	3.106	2.788	
Complete	77.2	60.2	5	12	72.494	418.66	49.04	262.6	22.6	53.2	1111.34	188.6	694.06	27.624	56.95	392.72	5.052	14.3	2.454	10.338	11.696	6.738	6.458	7.704
Incomplete	1868.8	1619.4	148.4	101	4866.4	11755.6	3305.6	8867.4	824.2	522.2	0	0	0	0	4672.8	2.5	6.29	1.77	16.89	3.686	3.094	3.106	2.788	
Total	1946	1679.6	153.4	113	4939.2	12174.4	3354.6	9130	846.8	575.4	12867.4	3494	9561.4	851.84	579.14	5065.2	0	0	0	0	0	0	0	0
2018 AM	2111.8	1839.6	175.4	96.8	5455.8	13630.8	3723.8	10908.8	997.4	359.2	0	0	0	0	5350.8	2.534	6.456	1.764	16.396	3.874	3.362	3.212	2.024	
Complete	88.4	59.2	13.6	15.6	73.436	465.64	50.34	249.8	59.2	47.8	1292.6	213.58	687.04	67.058	52.816	451.48	5.104	14.6	2.416	9.972	12.016	7.456	6.454	4.544
Incomplete	2111.8	1839.6	175.4	96.8	5455.8	13630.8	3723.8	10908.8	997.4	359.2	0	0	0	0	5350.8	2.534	6.456	1.764	16.396	3.874	3.362	3.212	2.024	
Total	2200.2	1898.8	189	112.4	5529.2	14096.4	3774.2	11158.6	1056.6	407	14923.6	3937.6	11595.8	1064.54	412	5802.4	0	0	0	0	0	0	0	0
2028 AM	488.6	440	28.8	19.8	1157.6	7429.2	798	5809.4	330.2	202.2	0	0	0	0	2558.4	1.048	3.04	0.326	1.29	2.568	1.616	1.404	1.25	
Complete	260.8	229.2	16.4	15.2	285.86	24774.8	197.72	1235	88.8	74.6	1094.2	90.54	699.4	17.298	22.16	349.6	1.656	5.186	0.43	0.994	4.712	7.366	7.906	6.644
Incomplete	488.6	440	28.8	19.8	1157.6	7429.2	798	5809.4	330.2	202.2	0	0	0	0	2558.4	1.048	3.04	0.326	1.29	2.568	1.616	1.404	1.25	
Total	749.4	669.2																						

appendix

18:30 - 18:45

	Measured Totals											Estimated Totals					Resultant Derived Averages (per vehicle)								
					Freeflow	Trip Time	Distance				Time	Distance				Total			Trip Time	Distance	Speed	Delay			
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy	
Existing	Complete	795.4	657.6	74.8	63	2150.8	3782	1450	2963.6	425.8	308.4	0	0	0	0	1696.2	2,134	4,746	1,822	23.16	2.04	2.462	3.106	2.538	
	Incomplete	41.6	31.8	2.6	7.2	87.332	141.74	57.26	113.2	16	33	255.6	98.266	166.29	14.582	33.728	113.738	2,674	6,012	2.38	24.938	3.308	2.732	5.22	3.492
	Total	837	689.4	77.4	70.2	2238.2	3924	1507.4	3076.8	441.8	341.4	4037.6	1548.2	3129.6	440.38	342.12	1810.2	0	0	0	0	0	0	0	0
2013 AM	Complete	847.8	706.2	66.8	74.8	2209	4918.4	1500.4	3337.6	303.4	535.4	0	0	0	0	2066.8	2.44	5,802	1.77	18.324	3.196	2.66	2.558	3.62	
	Incomplete	51.2	43.8	3.6	3.8	62.192	216.5	41.948	197	13	18	519.58	116.62	372.56	13.156	24.336	192.72	3,728	10.04	2,278	14.014	7.436	5.518	3.218	5.066
	Total	899	750	70.4	78.6	2271	5134.8	1542.2	3534.6	316.4	553.4	5438	1617	3710.2	316.54	559.762	2259.2	0	0	0	0	0	0	0	0
2018 AM	Complete	886.6	720.4	89	77.2	2274	5232.2	1544.4	3445.8	552.8	535	0	0	0	0	2224.6	2.51	5,896	1,742	17.738	3.33	2.74	3.404	3.876	
	Incomplete	71.2	53	7.4	10.8	81.392	369.88	54.596	254.4	30.4	38.6	880.62	167.02	490.8	37.022	50.554	317.46	4.38	12.15	2,332	11.602	9.588	6.27	5.86	5.214
	Total	957.8	773.4	96.4	88	2355.4	5602.2	1599	3700.2	583.2	573.6	6112.8	1711.2	3936.6	589.82	585.56	2541.8	0	0	0	0	0	0	0	0
2028 AM	Complete	269.4	243.2	16.2	10	658.6	3054.6	450	2855.8	132.8	84.2	0	0	0	0	1111	0.824	2,268	0.334	1,768	1.778	1.406	0.982	1.008	
	Incomplete	254.4	224	16	14.4	273.1	27923.6	189.402	1166.2	87.2	60.6	682.8	81.58	582.8	15.086	7.826	232.4	1,298	3,814	0.456	1,434	3.326	7.468	9	5.608
	Total	523.8	467.2	32.2	24.4	931.82	30978	639.44	4022	220	144.8	3737.2	531.6	3438.6	147.88	92.02	1343.4	0	0	0	0	0	0	0	0

18:45 - 19:00

	Measured Totals											Estimated Totals					Resultant Derived Averages (per vehicle)								
					Freeflow	Trip Time	Distance				Time	Distance				Total			Trip Time	Distance	Speed	Delay			
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy	
Existing	Complete	1511	1261	129.2	120.8	4123.4	6366.2	2774.2	4539	599.6	577.4	0	0	0	0	2899.4	1,912	4,194	1,836	26.464	1.468	1.942	2.524	2.594	
	Incomplete	30	26.2	1.2	2.6	48.654	56.125	33.98	36.4	1.2	1.8	125.72	68.142	79.616	1,258	2,174	53.758	1,788	4.19	2,276	32.63	1.464	1.186	1.004	0.632
	Total	1541	1287.2	130.4	123.4	4172.2	6422.4	2808	4575.4	600.8	579.2	6492	2842.4	4618.6	600.86	579.58	2953.6	0	0	0	0	0	0	0	0
2013 AM	Complete	1674.8	1391.6	144.4	138.8	4443.6	9069	3006	6355.4	685.8	881.6	0	0	0	0	3874.4	2,312	5,412	1,796	19.962	2.76	2.546	2.642	3.452	
	Incomplete	46	35.4	4.8	5.8	66.776	136.486	44.682	110.2	20.8	24.6	354.64	110.404	212.84	22.404	27.03	143.63	3.06	7,578	2,396	19.428	4.924	3.218	3.882	4.304
	Total	1720.8	1427	149.2	144.6	4510	9205.8	3050.6	6465.6	706.6	906.2	9423.6	3116.4	6568.4	708.2	908.58	4017.8	0	0	0	0	0	0	0	0
2018 AM	Complete	1783.4	1449	177	157.4	4632.8	10098.6	3140	6687.2	981.2	1064.2	0	0	0	0	4324.4	2,428	5,67	1,76	18.662	3.07	2,618	3.11	3.792	
	Incomplete	59	46.2	5	7.8	90.736	270.72	60.498	214.8	23.4	39.2	583.4	137.16	372.66	24.556	46.65	224.64	3,714	9,594	2,316	15.318	6.998	4.584	3.982	5.294
	Total	1842.4	1495.2	182	165.2	4723.8	10369.4	3200.4	6902	1004.6	1103.4	10681.8	3277	7060	1005.62	1110.74	4549.4	0	0	0	0	0	0	0	0
2028 AM	Complete	490	431.8	32.8	25.4	1200.8	5084.4	813.8	4794	273	193	0	0	0	0	1900.2	0.776	2,076	0.332	1.92	1.586	1.336	1.002	0.916	
	Incomplete	255.2	225	15.8	14.4	273.56	31226.2	190.16	1162.8	85.6	67.6	706	86.22	590.2	13.392	15.718	242.2	1,324	3,858	0.472	1,466	3.368	7.33	9.078	7.396
	Total	745.2	656.8	48.6	39.8	1474.42	36310.6	1004.04	5956.8	358.6	260.6	5790.4	900	5384.2	286.4	208.8	2142.4	0	0	0	0	0	0	0	0

appendix

Existing Conditions with Additional Bridge Capacity

7:30 - 9:30

	Measured Totals									Estimated Totals						Resultant Derived Averages (per vehicle)									
	Count				Freeflow	Time	Distance				Time	Distance				Total	Cost(\$)	Trip Time	Distance	Speed	Delay				
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy	
Existing	Complete	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Incomplete	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2013 AM	Complete	12012.2	10351.2	910.4	750.6	29819	34094	20692.8	19456.4	1699	1373.6	0	0	0	0	15609.36	1.283	2.80575	1.7205	37.3555	0.326	1.033	1.039	1.02225	
	Incomplete	596.4	500.6	48.2	47.6	992.464	1131.74	680.746	663.2	64.6	65.6	2315.52	1419.63	1102.262	67.146	63.472	1026.284	1.69725	3.837	2.3845	37.4575	1.3575	1.089	0.98275	1.07725
	Total	12608.6	10851.8	958.6	798.2	30813	35225.2	21372.8	20119.6	1763.6	1439.2	36410	22112	20558.54	1766.088	1437.102	16635.74	0	0	0	0	0	0	0	0
2018 AM	Complete	12709.6	10942.6	986.4	780.6	30657.2	40273.4	21375	26076.8	2333	1683.2	0	0	0	17999.1	1.39375	3.11775	1.67875	33.71025	0.7095	1.3495	1.338	1.23425		
	Incomplete	693.2	583.4	56.6	53.2	1207.55	1632.936	821.788	1023	101.2	86.2	3132.9	1639.24	1697.618	104.02	84.876	1336.746	1.84825	4.294	2.375	34.32725	1.888	1.2585	1.3315	1.262
	Total	13402.8	11526	1043	833.8	31864	41905.8	22197	27099.8	2434.2	1769.4	43406.4	23014.2	27774.7	2437.002	1768.1	19336.6	0	0	0	0	0	0	0	
2028 AM	Complete	13883.6	11976.2	1081.6	825.8	32380.8	58678.8	22725	43647.2	3793.8	2702.6	0	0	0	24744.26	1.75	4.143	1.63625	27.95675	1.81125	2.1095	2.03425	1.8995		
	Incomplete	871.8	732.4	73	66.4	1612.164	3475.716	1068.69	2393.2	252.8	200	6106.64	2027.66	3940.752	257.722	199.642	2390.166	2.41525	6.01275	2.34475	27.33475	3.68075	1.99875	2.26625	2.0245
	Total	14755.4	12708.6	1154.6	892.2	33993	62154.8	23793.2	46040.4	4046.6	2902.6	64784.8	24753.2	47587.56	4051.436	2902.304	27135.3	0	0	0	0	0	0	0	

8:30 - 9:30

	Measured Totals									Estimated Totals						Resultant Derived Averages (per vehicle)									
	Count				Freeflow	Time	Distance				Time	Distance				Total	Cost(\$)	Trip Time	Distance	Speed	Delay				
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy	
Existing	Complete	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Incomplete	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2013 AM	Complete	6230	5371.2	465.8	393	15793.6	19213.6	10955.4	12083.6	1012.2	841.2	0	0	0	8736	1.3985	3.0765	1.764	34.8625	0.5335	1.2475	1.235	1.214		
	Incomplete	296	248.6	23.8	23.6	491.704	566.1	337.65	345.2	31.8	32.8	1192.28	706.84	615.258	33.6	30.098	524.406	1.7445	3.973	2.397	36.3545	1.43	1.136	0.9945	1.0475
	Total	6526	5619.8	489.6	416.6	16285.8	19779.4	11292.8	12428.8	1044	874	20406	11662.2	12698.4	1045.758	871.33	9260.8	0	0	0	0	0	0	0	
2018 AM	Complete	6676.6	5762.6	510.6	403.4	16515.8	24622	11513.2	17486.8	1506.8	1102.4	0	0	0	10774.6	1.6155	3.693	1.729	28.6185	1.212	1.76	1.696	1.5855		
	Incomplete	367.4	308.6	31.2	27.6	671.912	1008.592	454.854	651.8	61.4	49	1889.12	869.98	1109.378	64.622	48.712	782.474	2.008	4.7985	2.371	30.879	2.32	1.385	1.3525	1.3605
	Total	7044	6071.2	541.8	431	17187.2	25630.6	11968.4	18138.6	1568.2	1151.4	26511.4	12383.6	18596.2	1571.42	1151.14	11557.4	0	0	0	0	0	0	0	
2028 AM	Complete	7371.6	6357.6	575.8	438.2	17574.6	41327.6	12344	33069.2	2841.2	2026	0	0	0	16779.4	2.305	5.688	1.6775	18.531	3.2995	3.134	2.9905	2.77		
	Incomplete	509.4	430.6	41.2	37.6	983.33	2495.834	644.062	1836.2	192.8	148.2	4441.98	1190.18	3110.48	195.788	147.888	1688.44	3.0235	7.8305	2.365	19.914	5.4415	2.684	3.063	2.7145
	Total	7881	6788.2	617	475.8	18557.8	43823.8	12987.8	34905.4	3034	2174.2	45769.4	13534.4	36179.4	3036.88	2173.96	18468.4	0	0	0	0	0	0	0	

7:00 - 7:15

	Measured Totals									Estimated Totals						Resultant Derived Averages (per vehicle)									
	Count				Freeflow	Time	Distance				Time	Distance				Total	Cost(\$)	Trip Time	Distance	Speed	Delay				
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy	
Existing	Complete																								
	Incomplete																								
	Total																								
2013 AM	Complete	424.6	367.4	31.2	26	926.84	912.4	648.9	170.6	18.4	15.2	0	0	0	403.5	0.95	2.146	1.528	42.68	-0.034	0.304	0.38	0.376		
	Incomplete	32.4	26.2	3.4	2.8	58.854	59.672	40.474	11	2	0.4	114.4	78.42	16.258	2.118	0.768	49.082	1.518	3.53	2.424	41.136	1.348	0.338	0.464	0.092
	Total	457	393.6	34.6	28.8	985.7	972.14	689.36	181.6	20.4	15.6	1026.84	727.3	186.84	20.518	15.968	452.58	0	0	0	0	0	0	0	
2018 AM	Complete	437	376.6	34	26.4	934.18	919.34	656.4	210	18.6	14.8	0	0	0	409.44	0.938	2.104	1.504	42.838	-0.034	0.372	0.364	0.38		
	Incomplete	32.4	27.4	2.6	2.4	54.066	54.954	36.81	12	1.6	0.2	108.43	74.362	18.186	1.646	0.226	46.428	1.43	3.342	2.29	41.094	1.2	0.392	0.312	0.084
	Total	469.4	404	36.6	28.8	988.2	974.36	693.18	222	20.2	15	1027.8	730.74	228.2	20.246	15.026	455.9	0	0	0	0	0	0	0	
2028 AM	Complete	501.8	431	40.6	30.2	1028.4	1020.2	728.76	261.6	23.8	15.2	0	0	0	456.6	0.91	2.034	1.454	42.876	-0.018	0.416	0.392	0.358		
	Incomplete	36.8	30.2	3.6	3	63.64	64.444	43.26	14	2.6	0.8	122.1	83.852	22.66	2.72	0.806	52.874	1.444	3.33	2.286	41.208	1.28	0.4	0.816	0.25
	Total	538.6	461.2	44.2	33.2	1092.2	1084.4	772	275.6	26.4	16	1142	812.6	284.26	26.52	16.006	509.5	0	0	0	0	0	0	0	

appendix

7:15 - 7:30

Existing	All	Measured Totals					Estimated Totals									Resultant Derived Averages (per vehicle)									
		Cars	Light	Heavy	Freeflow	Trip Time	Distance	Cars	Light	Heavy	Time	Distance	Cars	Light	Heavy	Total	Cost(\$)	Trip Time	Distance	Speed	Delay	Cars	Light	Heavy	
					(min)	(min)	(km)				(min)	(km)				Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)				
Complete																									
Incomplete																									
Total																									
2013 AM																									
Complete	1066.8	922.6	80.2	64	2420	2391.8	1690.2	581.8	53.6	43.4	0	0	0	0	0	1066.4	1	2.242	1.584	42.404	-0.028	0.398	0.422	0.426	
Incomplete	49.6	40.2	4	5.4	82.658	86.034	56.26	27.6	2.4	4.4	167.78	113.442	39.636	2.498	2.866	73.108	1.47	3.378	2.286	40.628	1.108	0.612	0.672	0.68	
Total	1116.4	962.8	84.2	69.4	2502.6	2478.2	1746.6	609.4	56	47.8	2559.6	1803.8	621.42	56.098	46.266	1139.8	0	0	0	0	0	0	0	0	0
2018 AM																									
Complete	1096.6	947.4	85.6	63.6	2445.4	2423.4	1716.6	668.2	68.2	36.8	0	0	0	0	0	1087.4	0.992	2.21	1.566	42.502	-0.02	0.45	0.51	0.374	
Incomplete	51.8	41.6	4.8	5.4	91.236	94.758	61.376	32	3.4	5.2	185.3	124.66	47.186	3.512	3.104	80.976	1.564	3.578	2.41	40.382	1.348	0.652	0.536	0.768	
Total	1148.4	989	90.4	69	2536.8	2518.4	1778	700.2	71.6	42	2608.6	1841.4	715.38	71.712	39.904	1168.4	0	0	0	0	0	0	0	0	0
2028 AM																									
Complete	1269.6	1092.2	104.2	73.2	2744.2	2740.2	1932.4	875.8	86.2	56	0	0	0	0	0	1242.6	0.98	2.16	1.524	42.32	-0.004	0.528	0.54	0.506	
Incomplete	48.6	39.6	3.8	5.2	80.096	83.384	54.7	20.6	3.8	4.2	169.36	114.58	37.652	3.902	2.818	73.98	1.524	3.486	2.356	40.55	1.324	0.462	0.874	0.81	
Total	1318.2	1131.8	108	78.4	2824.2	2823.8	1987.4	896.4	90	60.2	2909.8	2047	913.44	90.096	58.818	1316.8	0	0	0	0	0	0	0	0	0

7:30 - 7:45

Existing	All	Measured Totals					Estimated Totals									Resultant Derived Averages (per vehicle)									
		Cars	Light	Heavy	Freeflow	Trip Time	Distance	Cars	Light	Heavy	Time	Distance	Cars	Light	Heavy	Total	Cost(\$)	Trip Time	Distance	Speed	Delay	Cars	Light	Heavy	
					(min)	(min)	(km)				(min)	(km)				Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)				
Complete																									
Incomplete																									
Total																									
2013 AM																									
Complete	719.8	622.8	51.6	45.4	1681.6	1679	1171.2	555.4	43.6	45	0	0	0	0	0	761.16	1.058	2.332	1.626	41.86	-0.004	0.55	0.522	0.608	
Incomplete	49.2	42.2	4.6	2.4	85.96	88.24	58.298	30.8	4.8	1.2	169.98	114.95	46.716	5.01	1.348	74.538	1.518	3.456	2.334	40.548	1.118	0.626	0.616	0.49	
Total	769	665	56.2	47.8	1767.8	1767	1229.4	586.2	48.4	46.2	1849	1286.2	602.14	48.61	46.348	835.74	0	0	0	0	0	0	0	0	0
2018 AM																									
Complete	784.2	679.2	55.8	49.2	1774.8	1781.6	1240.6	605.2	54.4	43.6	0	0	0	0	0	808.7	1.03	2.274	1.582	41.786	0.008	0.566	0.628	0.568	
Incomplete	57	49.2	3.2	4.6	98.518	101.884	67.392	34.2	3.6	4.8	204.1	138.04	55.1	3.702	4.508	89.932	1.576	3.578	2.418	40.588	1.312	0.584	1.106	0.692	
Total	841.2	728.4	59	53.8	1873.6	1883.4	1307.6	639.4	58	48.4	1985.6	1378.4	660.3	58.102	48.108	898.6	0	0	0	0	0	0	0	0	0
2028 AM																									
Complete	869.8	750	66.2	53.6	1937.4	1964.6	1359.4	753.4	67.6	48.6	0	0	0	0	0	897.26	1.034	2.26	1.564	41.518	0.032	0.642	0.652	0.59	
Incomplete	54.4	44.8	4.8	4.8	98.234	101.842	66.06	34	4.2	4.2	191.06	127.38	53.552	4.256	3.844	83.926	1.542	3.514	2.342	39.982	1.288	0.598	0.778	0.682	
Total	924.2	794.8	71	58.4	2035.4	2066.6	1425.4	787.4	71.8	52.8	2155.2	1486.8	806.96	71.856	52.444	981.3	0	0	0	0	0	0	0	0	0

7:45 - 8:00

Existing	All	Measured Totals					Estimated Totals									Resultant Derived Averages (per vehicle)									
		Cars	Light	Heavy	Freeflow	Trip Time	Distance	Cars	Light	Heavy	Time	Distance	Cars	Light	Heavy	Total	Cost(\$)	Trip Time	Distance	Speed	Delay	Cars	Light	Heavy	
					(min)	(min)	(km)				(min)	(km)				Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)				
Complete																									
Incomplete																									
Total																									
2013 AM																									
Complete	1744.4	1502.4	132.6	109.4	3999.6	4092.8	2791.2	1737.8	151.8	132.4	0	0	0	0	0	1884.6	1.08	2.348	1.602	40.932	0.05	0.722	0.714	0.758	
Incomplete	74	59	6.6	8.4	120.98	133.22	82.944	66.4	6.6	11	272.3	177.24	100.208	7.07	11.22	122.5	1.656	3.686	2.398	39.034	1.392	1.024	0.924	1.188	
Total	1818.4	1561.4	139.2	117.8	4120.8	4226	2874	1804.2	158.4	143.4	4365.2	2968.4	1838	158.86	143.62	2007	0	0	0	0	0	0	0	0	0
2018 AM																									
Complete	1855.2	1599	138.4	117.8	4141.8	4262.4	2898	1815.8	169.8	135	0	0	0	0	0	1963	1.058	2.298	1.56	40.804	0.064	0.728	0.784	0.738	
Incomplete	75.2	63.2	6.6	5.4	126.44	139.64	85.972	79.8	10	6.6	285.2	184.62	118.76	10.01	6.828	127.76	1.702	3.794	2.458	38.852	1.566	1.114	1.252	0.926	
Total	1930.4	1662.2	145	123.2	4268	4402.2	2984	1895.6	179.8	141.6	4547.8	3082.8	1934.6	179.8	141.82	2090.8	0	0	0	0	0	0	0	0	0
2028 AM																									
Complete	2039.8	1749.6	159.6	130.6	4442.4	4660.2	3122.4	2221.2	205.2	155	0	0	0	0	0	2157.6	1.056	2.284	1.53	40.202	0.108	0.83	0.842	0.776	
Incomplete	73.6	62.8	6.4	4.4	119.18	132.94	82.002	74.4	9.8	5.8	271.22	175.2	113.7	10.03	5.91	121.36	1.652	3.688	2.382	38.766	1.512	1.06	1.344	1.248	
Total	2113.4	1812.4	166	135	4561.6	4793	3204.4	2295.6	215	160.8	4931.4	3297.8	2334.8	215.24	160.9	2279	0	0	0	0	0	0	0	0	0

appendix

8:00 - 8:15

	Measured Totals											Estimated Totals					Resultant Derived Averages (per vehicle)								
					Freeflow	Trip Time	Distance				Time	Distance				Total			Trip Time	Distance	Speed	Delay			
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy	
Existing	Complete																								
	Incomplete																								
	Total																								
2013 AM	Complete	1069.6	921.8	82	65.8	2691.2	2873.8	1862.8	1515.6	145.2	102.2	0	0	0	1332	1,246	2,686	1.74	38,906	0.17	0.942	1.018	0.896		
	Incomplete	80	69.2	5.6	5.2	140.94	153.38	96.368	81.2	5.2	6.8	298.32	191.46	130.58	5.482	7.084	132.38	1,654	3,734	2,394	38.514	1.216	0.966	0.654	1.156
	Total	1149.6	991	87.6	71	2832.4	3027	1959	1596.8	150.4	109	3172.2	2054	1646.4	150.68	109.284	1464.2	0	0	0	0	0	0	0	0
2018 AM	Complete	1093.8	935.8	91	67	2639	2958.2	1839.4	1793.4	182.6	120	0	0	0	1380.6	1,262	2,706	1,682	37,436	0.294	1.144	1.206	1.058		
	Incomplete	83.6	70.6	7	6	137.48	155.16	94.77	92.4	9.8	9.2	313.96	198	151.56	9.936	9.064	141	1,694	3,768	2,376	37,826	1.356	1.164	1.142	1.4
	Total	1177.4	1006.4	98	73	2776	3113	1934.2	1885.8	192.4	129.2	3272	2037.2	1945.2	192.54	129.052	1521.8	0	0	0	0	0	0	0	0
2028 AM	Complete	1176.8	1021.2	92	63.6	2795.8	3259	1955	2157.6	184.8	131.4	0	0	0	1511.2	1,286	2,768	1,66	36,036	0.394	1.27	1.206	1.244		
	Incomplete	86	70.6	8	7.4	145.5	175.76	99.646	109.2	15	10.6	329.88	195.96	173.56	15.286	10.89	147.86	1,724	3,84	2,288	35,752	1.464	1.334	1.604	1.254
	Total	1262.8	1091.8	100	71	2941.4	3434.8	2054.6	2266.8	199.8	142	3589	2151.2	2331	200.08	142.3	1659.4	0	0	0	0	0	0	0	0

8:15 - 8:30

	Measured Totals											Estimated Totals					Resultant Derived Averages (per vehicle)								
					Freeflow	Trip Time	Distance				Time	Distance				Total			Trip Time	Distance	Speed	Delay			
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy	
Existing	Complete																								
	Incomplete																								
	Total																								
2013 AM	Complete	2248.4	1933	178.4	137	5653	6234.8	3912.2	3564	346.2	252.8	0	0	0	2895.6	1,286	2,774	1.74	37,696	0.258	1.06	1.118	1.06		
	Incomplete	97.2	81.6	7.6	8	152.88	190.8	105.486	139.6	16.2	13.8	382.64	229.14	209.5	15.984	13.722	172.46	1,772	3,928	2,362	36.146	1.414	1.552	1.69	1.594
	Total	2345.6	2014.6	186	145	5806.2	6425.8	4017.6	3703.6	362.4	266.6	6617.6	4141.2	3773.6	362.18	266.52	3068	0	0	0	0	0	0	0	0
2018 AM	Complete	2299.8	1966	190.6	143.2	5585.8	6649.2	3883.8	4375.6	419.4	282.2	0	0	0	3072.2	1,338	2,892	1.69	35,182	0.462	1.318	1.302	1.168		
	Incomplete	110	91.8	8.6	9.6	173.2	227.66	118.8	164.8	16.4	16.6	440.52	248.6	262.82	15.75	15.764	195.58	1,782	4,018	2,264	33,836	1.59	1.666	1.742	1.636
	Total	2409.8	2057.8	199.2	152.8	5759.2	6876.6	4002.8	4540.4	435.8	298.8	7089.6	4132.2	4638.4	435.14	297.98	3268	0	0	0	0	0	0	0	0
2028 AM	Complete	2425.6	2097.8	188	139.8	5630.6	7467.4	3944.2	5445.8	495	341.6	0	0	0	3398.8	1,404	3,08	1,626	31,774	0.758	1.598	1.612	1.506		
	Incomplete	148.4	123.6	12.6	12.2	265.92	569.34	176.92	339.4	31	31.2	872.5	338.94	489.46	32.362	31.11	348.58	2,31	5,738	2,286	24,522	3.416	2.262	2.152	2.154
	Total	2574	2221.4	200.6	152	5896.8	8036.6	4121	5785.2	526	372.8	8339.8	4283	5935.4	527.38	372.7	3747.2	0	0	0	0	0	0	0	0

8:30 - 8:45

	Measured Totals											Estimated Totals					Resultant Derived Averages (per vehicle)								
					Freeflow	Trip Time	Distance				Time	Distance				Total			Trip Time	Distance	Speed	Delay			
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy	
Existing	Complete																								
	Incomplete																								
	Total																								
2013 AM	Complete	1184.2	1026	87.4	70.8	3006	3953.2	2084	2773.2	232.4	180.4	0	0	0	1783.4	1,504	3,336	1.76	31,908	0.796	1.532	1.524	1.446		
	Incomplete	88	74.6	7.6	5.8	142.44	163.44	97.9	107.2	10.6	8.8	361.24	208.8	196.22	11.442	9.222	158.58	1,8	4,098	2,374	34,778	1.562	1.298	1.342	1.344
	Total	1272.2	1100.6	95	76.6	3148.6	4116.4	2182	2880.4	243	189.2	4314.2	2292.8	2969.2	243.84	189.64	1942	0	0	0	0	0	0	0	0
2018 AM	Complete	1169.8	1009.2	88.8	71.8	2868.6	4619	1999.4	3588.8	290.2	225.2	0	0	0	2010.8	1,72	3,958	1,712	26,122	1.506	2.088	1.922	1.852		
	Incomplete	120.4	100	10	10.4	228.36	384.86	153.2	249.6	28	24	668.4	276.68	398.66	28.228	24.596	273.78	2,238	5,44	2,298	26,052	2.992	1.894	2.076	1.82
	Total	1290.2	1109.2	98.8	82.2	3097	5003.8	2152.6	3838.4	318.2	249.2	5287.4	2276	3987.6	318.44	249.8	2284.8	0	0	0	0	0	0	0	0
2028 AM	Complete	1251	1074.2	102.2	74.6	2889.2	6249.6	2033.8	5120.8	431.6	298.8	0	0	0	2583.2	2,068	5,004	1,624	19.8	2,696	2,928	2.61	2.456		
	Incomplete	158	131.4	13	13.6	311.8	815.14	202.58	561.4	54.8	63.4	1366.84	364.2	886.88	54.396	65.432	520.48	3,18	8,298	2,308	17,646	5.99	3.124	3.146	3.468
	Total	1409	1205.6	115.2	88.2	3201	7064.8	2236.2	5682.2	486.4	362.2	7616.6	2397.8	6007.6	486	364.24	3103.8	0	0	0	0	0	0	0	0

appendix

8:45 - 9:00

Existing	Measured Totals											Estimated Totals					Resultant Derived Averages (per vehicle)								
	All	Cars	Light	Heavy	Freeflow Time (min)	Trip Time (min)	Distance (km)	Cars	Light	Heavy	Time (min)	Distance (km)	Cars	Light	Heavy	Total Cost(\$)	Cost(\$)	Trip Time (min)	Distance (km)	Speed (km/h)	Delay (min)	Cars	Light	Heavy	
	Complete	Incomplete	Total																						
2013 AM	Complete	2399	2078.6	177.4	143	6038.6	7679.4	4185	5471	436.8	350.8	0	0	0	0	0	3499.4	1.46	3.2	1.744	32.818	0.682	1.508	1.42	1.406
	Incomplete	97.8	80	7.8	10	159.56	204.4	109.894	154	16.6	17	414.2	256.22	17.136	15.024	184.24	1.88	4.22	2.348	33.478	1.702	1.698	1.978	1.454	
	Total	2496.8	2158.6	185.2	153	6198.2	7883.6	4294.8	5625	453.4	367.8	8093.6	4415.4	5727.2	453.92	365.84	3683.8	0	0	0	0	0	0	0	0
2018 AM	Complete	2432.4	2097.8	189.4	145.2	5977.6	9812.6	4161.2	7597.8	688.2	469.4	0	0	0	0	0	4264.2	1.758	4.04	1.71	25.728	1.582	2.12	2.118	1.916
	Incomplete	126.2	109.2	10.8	6.2	237.26	407.16	161.16	325	25	14	739.66	304.64	516.78	27.018	14.664	301.74	2.362	5.772	2.41	25.5	3.316	2.308	1.748	1.888
	Total	2558.6	2207	200.2	151.4	6214.6	10219.6	4322.4	7922.8	713.2	483.4	10552.2	4465.8	8114.6	715.22	484.06	4566	0	0	0	0	0	0	0	0
2028 AM	Complete	2512	2168.2	197	146.8	5839	13488	4102.8	10953.8	935.4	656.8	0	0	0	0	0	5504.8	2.194	5.38	1.634	18.538	3.056	3.096	2.918	2.76
	Incomplete	201.8	176	15.2	10.6	385.66	1182.86	249.96	899.6	101.8	49.6	1994.2	460.9	1451.64	101.206	49.42	740.82	3.528	9.432	2.28	15.54	7.108	3.902	5.234	3.466
	Total	2713.8	2344.2	212.2	157.4	6224.6	14670.8	4352.6	11853.4	1037.2	706.4	15482	4563.8	12405.4	1036.56	706.22	6246	0	0	0	0	0	0	0	0

9:00 - 9:15

Existing	Measured Totals											Estimated Totals					Resultant Derived Averages (per vehicle)								
	All	Cars	Light	Heavy	Freeflow Time (min)	Trip Time (min)	Distance (km)	Cars	Light	Heavy	Time (min)	Distance (km)	Cars	Light	Heavy	Total Cost(\$)	Cost(\$)	Trip Time (min)	Distance (km)	Speed (km/h)	Delay (min)	Cars	Light	Heavy	
	Complete	Incomplete	Total																						
2013 AM	Complete	903	777.2	64.6	61.2	2332.8	2732.4	1618.2	1522	136.6	124.6	0	0	0	0	0	1244.4	1.368	3.002	1.792	36.396	0.418	1.074	1.144	1.12
	Incomplete	50.2	43	4.4	2.8	87.374	90.336	59.622	39.2	2.6	1.6	193.28	123.18	79.664	2.852	2.436	84.242	1.674	3.836	2.456	38.436	1.252	0.778	0.364	0.508
	Total	953.2	820.2	69	64	2420.4	2822.6	1677.6	1561.2	139.2	126.2	2925.8	1741	1601.6	139.438	127.03	1328.6	0	0	0	0	0	0	0	0
2018 AM	Complete	1087.4	939.2	79.4	68.8	2763.4	4005.2	1927	2724.4	227.2	174	0	0	0	0	0	1751.6	1.604	3.668	1.77	29.204	1.122	1.626	1.606	1.422
	Incomplete	55.4	45	5	5.4	98.056	101.992	66.708	33.8	3	6	224.66	132.1	89.726	3.648	6.394	96.474	1.742	4.058	2.384	35.3	1.516	0.63	0.446	0.944
	Total	1142.8	984.2	84.4	74.2	2861.4	4107.2	1993.8	2758.2	230.2	180	4230	2059.2	2814.2	230.84	180.42	1848.2	0	0	0	0	0	0	0	0
2028 AM	Complete	1253.8	1085.8	93.6	74.4	3136.8	8776.8	2198.6	7011	587.8	441.6	0	0	0	0	0	3460.8	2.754	6.982	1.75	15.79	4.482	3.664	3.608	3.318
	Incomplete	81.2	67.4	7	6.8	164.88	349.34	110.424	296.2	28	28.4	677.34	198.42	519.76	30.616	26.602	266.2	3.076	7.826	2.434	20.206	5.326	2.6	2.79	3.038
	Total	1335	1153.2	100.6	81.2	3301.8	9126.4	2309	7307.2	615.8	470	9454.2	2397.2	7530.8	618.42	468.2	3727	0	0	0	0	0	0	0	0

9:15 - 9:30

Existing	Measured Totals											Estimated Totals					Resultant Derived Averages (per vehicle)								
	All	Cars	Light	Heavy	Freeflow Time (min)	Trip Time (min)	Distance (km)	Cars	Light	Heavy	Time (min)	Distance (km)	Cars	Light	Heavy	Total Cost(\$)	Cost(\$)	Trip Time (min)	Distance (km)	Speed (km/h)	Delay (min)	Cars	Light	Heavy	
	Complete	Incomplete	Total																						
2013 AM	Complete	1743.8	1489.4	136.4	118	4416.2	4848.6	3068.2	2317.4	206.4	185.4	0	0	0	0	0	2208.8	1.262	2.768	1.76	38.328	0.238	0.876	0.852	0.884
	Incomplete	60	51	4	5	102.33	107.924	70.234	44.8	2	5.4	223.56	144.72	83.154	2.17	3.416	97.344	1.624	3.738	2.41	38.726	1.204	0.77	0.294	0.884
	Total	1803.8	1540.4	140.4	123	4518.6	4956.8	3138.4	2362.2	208.4	190.8	5072.4	3213	2400.4	208.56	188.82	2306.4	0	0	0	0	0	0	0	0
2018 AM	Complete	1987	1716.4	153	117.6	4906.2	6185.2	3425.6	3575.8	301.2	233.8	0	0	0	0	0	2748	1.38	3.106	1.724	33.42	0.638	1.206	1.138	1.152
	Incomplete	65.4	54.4	5.4	5.6	108.236	114.58	73.786	43.4	5.4	5	256.4	156.56	104.212	5.728	3.058	110.48	1.69	3.924	2.392	36.664	1.456	0.708	1.14	0.79
	Total	2052.4	1770.8	158.4	123.2	5014.2	6300	3499.6	3619.2	306.6	238.8	6441.8	3582.6	3679.8	306.92	236.86	2858.4	0	0	0	0	0	0	0	0
2028 AM	Complete	2354.8	2029.4	183	142.4	5709.6	12813.2	4008.8	9983.6	886.4	628.8	0	0	0	0	0	5230.6	2.204	5.386	1.702	19.996	2.964	2.848	2.826	2.546
	Incomplete	68.4	55.8	6	6.6	120.99	148.494	81.098	79	8.2	6.8	403.6	166.66	252.2	9.57	6.434	160.94	2.31	5.766	2.438	26.264	3.342	1.11	1.082	0.886
	Total	2423.2	2085.2	189	149	5830.4	12961.8	4090	10062.6	894.6	635.6	13216.6	4175.6	10235.6	895.9	635.3	5391.6	0	0	0	0	0	0	0	0

appendix

9:30 - 9:45

Existing	Measured Totals										Estimated Totals					Resultant Derived Averages (per vehicle)									
					Freeflow	Trip Time	Distance				Time	Distance				Total			Trip Time	Distance	Speed	Delay			
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy	
Complete																									
Incomplete																									
Total																									
2013 AM	Complete	843.8	729	62.8	52	2138	2173.8	1482.8	871.8	67	60	0	0	0	0	990.6	1,174	2,574	1,756	40,942	0.042	0.682	0.612	0.672	
	Incomplete	63.4	51	5.8	6.6	104.654	110.29	72,196	40.6	3.2	4.4	225.96	151	71,154	3,22	3,408	98,964	1,554	3,556	2,372	40,086	1,018	0.68	0.472	0.748
	Total	907.2	780	68.6	58.6	2242.8	2284.4	1555	912.4	70.2	64.4	2400	1633.8	942.84	70.22	63,408	1089.6	0	0	0	0	0	0	0	0
2018 AM	Complete	880.2	760.4	70.2	49.6	2159.2	2193.4	1505.4	892	76.8	55.8	0	0	0	0	1003.04	1,138	2,49	1,712	41,194	0.038	0.686	0.644	0.664	
	Incomplete	57.6	49.2	4	4.4	102,376	106,166	69,404	37.8	2.4	3.6	207.34	138.56	66,418	2,592	3,322	90,85	1,574	3,596	2,402	40,066	1,142	0.638	0.424	0.638
	Total	937.8	809.6	74.2	54	2261.6	2299.6	1575	929.8	79.2	59.4	2400.6	1644.2	958.42	79,392	59,122	1094	0	0	0	0	0	0	0	0
2028 AM	Complete	976.4	840.2	72.6	63.6	2343.6	2610.6	1646.8	1378	115.8	102.8	0	0	0	0	1198.8	1,218	2,654	1,684	38,722	0,254	0,954	0,892	0,908	
	Incomplete	64.2	54.2	5.2	4.8	109,768	115,54	73,618	55	5.2	4.2	238.14	153,04	98,164	5,05	3,122	104,552	1,63	3,71	2,386	38,672	1,314	0,878	0,86	0,814
	Total	1040.6	894.4	77.8	68.4	2453.4	2725.8	1720.4	1433	121	107	2848.6	1799.8	1476	120,848	105,92	1302.8	0	0	0	0	0	0	0	0

9:45 - 10:00

Existing	Measured Totals										Estimated Totals					Resultant Derived Averages (per vehicle)									
					Freeflow	Trip Time	Distance				Time	Distance				Total			Trip Time	Distance	Speed	Delay			
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy	
Complete																									
Incomplete																									
Total																									
2013 AM	Complete	1672.2	1437.8	130	104.4	4188.6	4254.8	2906.6	1652.6	137.2	125.6	0	0	0	0	1940.8	1,158	2,546	1,74	40,992	0,042	0,66	0,604	0,696	
	Incomplete	55	45.6	6.8	2.6	97,184	100,072	65,704	32.2	5	1.6	206.26	137.62	57,564	5,424	1,764	89,952	1,634	3,742	2,494	40,032	1,234	0,59	0,616	0,33
	Total	1727.2	1483.4	136.8	107	4285.8	4354.8	2972.2	1684.8	142.2	127.2	4461.2	3044.4	1710.4	142,62	127,38	2030.8	0	0	0	0	0	0	0	0
2018 AM	Complete	1732	1492.2	136.8	103	4201.4	4271.6	2931	1679.6	153	122.2	0	0	0	0	1955.4	1,13	2,466	1,692	41,172	0,04	0,666	0,66	0,702	
	Incomplete	57.8	48.6	5.4	3.8	101,498	105,886	68,846	34.4	3.8	3.6	208.3	138.18	62,288	4,178	3,722	91,286	1,574	3,6	2,39	39,846	1,172	0,578	0,55	0,866
	Total	1789.8	1540.8	142.2	106.8	4302.6	4377.6	3000	1714	156.8	125.8	4480	3069.4	1742	157,18	125,9	2046.8	0	0	0	0	0	0	0	0
2028 AM	Complete	1954.2	1685.4	146.2	122.6	4573.4	4915.2	3215.8	2427.2	216.4	171	0	0	0	0	2265.2	1,158	2,51	1,646	39,556	0,17	0,87	0,882	0,83	
	Incomplete	61.8	51.8	5.6	4.4	103,726	110,078	70,75	47.4	7.2	3.2	229.9	149.38	84,86	7,456	3,51	101,512	1,644	3,718	2,418	39,102	1,374	0,8	1,134	0,662
	Total	2016	1737.2	151.8	127	4677	5025.6	3286.6	2474.6	223.6	174.2	5145.2	3365.4	2512	223,88	174,52	2366.8	0	0	0	0	0	0	0	0

appendix

16:00 - 18:00

	Measured Totals											Estimated Totals						Resultant Derived Averages (per vehicle)								
	Count				Freeflow	Trip Time	Distance				Time	Distance				Total	Cost(\$)	Trip Time	Distance	Speed	Delay	h)				
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy		
Existing	Complete	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Incomplete	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2013 AM	Complete	14309.8	12328.4	1107.6	873.8	34480	41607.4	23640	27927.8	2471.4	1834.6	0	0	0	0	19087	1.327	2.89125	1.647	34.47075	0.4895	1.362	1.3385	1.257		
	Incomplete	730	613.2	62.8	54	1134.34	1485.2	747.382	1121.2	119.8	96	3243.16	1752.66	1984.34	126.776	96.564	1419.86	1.9325	4.40975	2.4055	33.07	2.00825	1.76625	1.85025	1.61225	
	Total	15039.8	12941.6	1170.4	927.8	35614	43093.4	24387.2	29049	2591.2	1930.6	44851	25393.4	29912.4	2598.18	1931.21	20506.2	0	0	0	0	0	0	0	0	0
2018 AM	Complete	15358.8	13264.2	1177	917.6	36305.2	55959.2	24959.6	44484.6	3732.2	2886.8	0	0	0	0	24720.2	1.60375	3.62775	1.62225	27.86225	1.268	2.03475	1.9115	1.9075		
	Incomplete	938.6	799.2	73.6	65.8	1580.82	2637.56	1032.656	2144.4	176.4	163.2	5364.6	2249.04	3902.74	189.57	165.876	2228.32	2.32	5.56375	2.3925	26.736	3.20375	2.344	2.14225	2.12275	
	Total	16297.4	14063.4	1250.6	983.4	37887	58596.2	25992.4	46629	3908.6	3050	61324.2	27208.6	48387.8	3921.78	3052.66	26947.4	0	0	0	0	0	0	0	0	0
2028 AM	Complete	11769.2	10220	900.8	648.4	24192.56	77317.4	16961.36	61758.6	4803.2	3292.2	0	0	0	0	29587.6	2.723	7.7175	1.30025	14.913	5.87475	4.19275	3.59925	3.60975		
	Incomplete	2481.2	2161.8	173.2	146.2	3597.82	52145.56	2318.84	15702.6	1318.4	940.6	41792.04	4388.976	24045.08	1001.304	703.824	13438.42	4.94675	14.9455	1.9105	10.4775	13.1045	7.132	7.7145	6.55225	
	Total	14250.4	12381.8	1074	794.6	27790.42	129462.6	19280.7	77461.2	6121.6	4232.8	119109.2	21350.14	85803.46	5804.478	3995.88	43025.76	0	0	0	0	0	0	0	0	0

16:30 - 17:30

	Measured Totals											Estimated Totals						Resultant Derived Averages (per vehicle)								
	Count				Freeflow	Trip Time	Distance				Time	Distance				Total	Cost(\$)	Trip Time	Distance	Speed	Delay	h)				
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy		
Existing	Complete	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Incomplete	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2013 AM	Complete	7368.8	6355.2	558.6	455	18031.8	22320.8	12356.2	15244.8	1330	1014.6	0	0	0	0	10189.8	1.3795	3.0225	1.675	33.4985	0.579	1.43	1.4095	1.321		
	Incomplete	385.2	321	33.6	30.6	589.86	811.92	389.708	629.4	64.6	58.2	1774.48	928.88	1113.26	68.858	57.212	772.84	1.9905	4.5645	2.4195	32.21	2.122	1.915	1.899	1.7515	
	Total	7754	6676.2	592.2	485.6	18621.6	23133.2	12745.6	15874.2	1394.6	1072.8	24095.4	13285.4	16358.4	1398.86	1071.84	10962	0	0	0	0	0	0	0	0	0
2018 AM	Complete	7862.2	6768.4	620.4	473.4	18806.8	29318.2	12917.2	23141	2074.4	1522.2	0	0	0	0	12935.8	1.6435	3.7245	1.6445	26.7655	1.3305	2.0715	2.0105	1.961		
	Incomplete	506	429	39.2	37.8	855.08	1531.72	557.344	1295.4	100.4	101.8	3037.48	1208.48	2283.94	106.84	104.816	1254.7	2.419	5.825	2.3845	25.399	3.431	2.6345	2.201	2.3595	
	Total	8368.2	7197.4	659.6	511.2	19662.4	30849.4	13474.8	24436.4	2174.8	1624	32355.8	14125.8	25425.4	2181.22	1626.98	14189.8	0	0	0	0	0	0	0	0	0
2028 AM	Complete	6105.2	5314	456.2	335	12999.12	41722.6	9096.56	35947.4	2633.6	1901	0	0	0	0	16177.24	2.5815	6.831	1.4095	12.982	4.8285	4.4595	3.8145	3.6395		
	Incomplete	1300.8	1138.6	90.4	71.8	1855.92	19905.96	1187.28	8139.6	678.2	472.8	20197.8	2461.648	13528.8	551.324	373.538	6728.64	5.1675	15.2785	1.9965	8.073	13.2795	7.777	8.222	7.298	
	Total	7406	6452.6	546.6	406.8	14854.82	61628	10284.32	44087	3311.8	2373.8	61920.2	11558.42	49476.2	3185.138	2274.54	22905.36	0	0	0	0	0	0	0	0	0

16:00 - 16:15

	Measured Totals											Estimated Totals						Resultant Derived Averages (per vehicle)								
	Count				Freeflow	Trip Time	Distance				Time	Distance				Total	Cost(\$)	Trip Time	Distance	Speed	Delay	h)				
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy		
Existing	Complete																									
	Incomplete																									
	Total																									
2013 AM	Complete	1131.2	973.8	91	66.4	2350.6	2567.2	1629.4	1587.8	135.8	105.6	0	0	0	0	1203.4	1.064	2.27	1.44	38.094	0.19	1.132	1.036	1.1		
	Incomplete	92	78	6.6	7.4	147.8	176.36	97.524	125.6	11.6	12.4	367.02	218.4	203.28	12.5	12.748	164.38	1.788	3.992	2.38	35.798	1.912	1.514	1.828	1.588	
	Total	1223.2	1051.8	97.6	73.8	2498.2	2743.8	1727	1713.4	147.4	118	2934.4	1848.4	1791	148.3	118.35	1367.8	0	0	0	0	0	0	0	0	0
2018 AM	Complete	1198.8	1038	92.4	68.4	2467.2	2763.6	1714	1796.4	153.2	121.2	0	0	0	0	1296	1.082	2.306	1.428	37.218	0.246	1.214	1.158	1.232		
	Incomplete	97.4	83.8	7.8	5.8	153.22	203.1	101.206	160	15	6.8	415.62	232.96	252.46	15.564	6.924	181.64	1.86	4.256	2.39	33.81	2.194	1.832	1.876	1.046	
	Total	1296.2	1121.8	100.2	74.2	2620.4	2966.8	1815	1956.4	168.2	128	3179.4	1946.8	2048.8	168.76	128.14	1477.4	0	0	0	0	0	0	0	0	0
2028 AM	Complete	1258.2	1090.8	96.4	71	2465.2	3044.8	1718.8	2177	171	151.6	0	0	0	0	1406.4	1.116	2.42	1.366	33.888	0.464	1.462	1.302	1.57		
	Incomplete	139	117.2	13	8.8	219.66	376.16	145.02	309.6	31.8	22.6	657.78	309.66	442.74	33.162	22.71	282.52	2.032	4.722	2.23	28.352	2.764	2.356	2.68		
	Total	1397.2	1208	109.4	79.8	2684.8	3421	1864	2486.6	202.8	174.2	3702.6	2028.4	2619.6	204.16	174.32	1689.2	0	0	0	0	0	0	0	0	

appendix

16:15 - 16:30

Existing	Measured Totals										Estimated Totals					Resultant Derived Averages (per vehicle)									
	All	Cars	Light	Heavy	Freeflow	Trip Time	Distance	Cars	Light	Heavy	Time	Distance	Cars	Light	Heavy	Total	Cost(\$)	Trip Time	Distance	Speed	Delay	Cars	Light	Heavy	
					(min)	(min)	(km)				(min)	(km)				Cost(\$)		(min)	(km)	(km/h)	(min)				
Complete																									
Incomplete																									
Total																									
2013 AM																									
Complete	2396.8	2070.8	188.6	137.4	5331.4	6285	3672.8	4134.6	347.6	256.6	0	0	0	0	0	2888.2	1.206	2.618	1.534	35.176	0.396	1.3	1.2	1.212	
Incomplete	90	76	8.2	5.8	134.44	170.16	88.534	128.2	12.4	8.8	379.84	212.36	226.86	12.614	9.146	166.28	1.842	4.21	2.356	33.65	1.984	1.716	1.582	1.462	
Total	2486.8	2146.8	196.8	143.2	5465.8	6455	3761.4	4262.8	360	265.4	6665	3885.2	4361.6	360.2	265.74	3054.6	0	0	0	0	0	0	0	0	
2018 AM																									
Complete	2543.2	2206.4	189.6	147.2	5522.6	7235.4	3818.8	5146.8	426.8	326.2	0	0	0	0	0	3269	1.284	2.846	1.5	31.772	0.674	1.554	1.494	1.472	
Incomplete	117.6	98.8	10.4	8.4	196.84	296.82	128.926	238.2	27.4	21	586.24	283.44	381.38	29.18	21.224	253.02	2.126	4.924	2.406	29.646	2.752	2.14	2.268	2.17	
Total	2660.8	2305.2	200	155.6	5719.4	7532.4	3947.8	5385	454.2	347.2	7821.8	4102.4	5528.4	456	347.42	3522	0	0	0	0	0	0	0	0	
2028 AM																									
Complete	2600.8	2255	200.4	145.4	5313.8	9023.4	3705.8	7363.6	620.4	441.4	0	0	0	0	0	3916.8	1.506	3.468	1.422	24.79	1.426	2.29	2.17	2.128	
Incomplete	197	163.4	16.8	16.8	339.06	1032.64	217.28	775.4	84.2	72.2	1645.26	454.04	1148.68	86.478	72.276	638.36	3.14	7.984	2.308	17.878	5.944	4.3	4.574	3.834	
Total	2797.8	2418.4	217.2	162.2	5653	10055.8	3923	8139	704.6	513.6	10668.2	4159.8	8512.2	706.88	513.68	4555	0	0	0	0	0	0	0	0	

16:30 - 16:45

Existing	Measured Totals										Estimated Totals					Resultant Derived Averages (per vehicle)									
	All	Cars	Light	Heavy	Freeflow	Trip Time	Distance	Cars	Light	Heavy	Time	Distance	Cars	Light	Heavy	Total	Cost(\$)	Trip Time	Distance	Speed	Delay	Cars	Light	Heavy	
					(min)	(min)	(km)				(min)	(km)				Cost(\$)		(min)	(km)	(km/h)	(min)				
Complete																									
Incomplete																									
Total																									
2013 AM																									
Complete	1240.4	1073.2	95.4	71.8	2919	3592.8	2005.6	2473.2	208.4	147.6	0	0	0	0	0	1638	1.318	2.894	1.618	33.74	0.54	1.424	1.35	1.272	
Incomplete	85.8	72.2	7.2	6.4	136.98	158.42	90.352	104.4	8.6	10	364.22	211.3	201.94	9.478	10.664	160.34	1.876	4.268	2.47	34.772	1.916	1.384	1.15	1.382	
Total	1326.2	1145.4	102.6	78.2	3055.8	3751.6	2096	2577.6	217	157.6	3957.2	2216.8	2675.2	217.88	158.28	1798.4	0	0	0	0	0	0	0	0	
2018 AM																									
Complete	1352.4	1163.4	103.6	85.4	3212.4	4803.8	2203.6	3719.6	325	268.2	0	0	0	0	0	2139.4	1.58	3.548	1.628	27.596	1.178	1.958	1.91	1.914	
Incomplete	103.8	87.6	9	7.2	165.64	243.18	109.4	191	19.8	17	537.56	244.9	375.22	21.408	17.04	227.76	2.158	5.086	2.354	28.452	2.712	1.998	2.094	2.054	
Total	1456.2	1251	112.6	92.6	3378.2	5047	2313	3910.6	344.8	285.2	5341.2	2448.8	4094.8	346.4	285.24	2367	0	0	0	0	0	0	0	0	
2028 AM																									
Complete	1233.6	1063.6	94.8	75.2	2662.4	7268.6	1859.76	6132	486.2	356.6	0	0	0	0	0	2892.8	2.314	5.846	1.484	15.502	3.726	3.752	3.376	3.144	
Incomplete	264.2	229.8	17.8	16.6	429.42	2057.36	272.88	1323	100.2	84.2	3643.4	612.1	2527.8	105.51	84.24	1267.84	4.588	12.862	2.34	11.706	10.744	5.668	5.564	5.376	
Total	1497.8	1293.4	112.6	91.8	3091.8	9325.6	2132.8	7455	586.4	440.8	10911.6	2471.8	8659.8	591.72	440.84	4160.2	0	0	0	0	0	0	0	0	

16:45 - 17:00

Existing	Measured Totals										Estimated Totals					Resultant Derived Averages (per vehicle)									
	All	Cars	Light	Heavy	Freeflow	Trip Time	Distance	Cars	Light	Heavy	Time	Distance	Cars	Light	Heavy	Total	Cost(\$)	Trip Time	Distance	Speed	Delay	Cars	Light	Heavy	
					(min)	(min)	(km)				(min)	(km)				Cost(\$)		(min)	(km)	(km/h)	(min)				
Complete																									
Incomplete																									
Total																									
2013 AM																									
Complete	2450	2122.4	187	140.6	5892	7028	4036.6	4631.8	399.8	283.6	0	0	0	0	0	3215	1.312	2.868	1.648	34.604	0.464	1.322	1.298	1.23	
Incomplete	89.4	73.8	8.4	7.2	144.54	185.34	94.548	129.8	12	10.2	399.12	220.28	227.08	12.908	10.96	173.72	1.926	4.418	2.464	33.782	2.014	1.616	1.352	1.166	
Total	2539.4	2196.2	195.4	147.8	6036.6	7213.4	4131	4761.6	411.8	293.8	7427.2	4257	4859	412.7	294.58	3388.4	0	0	0	0	0	0	0	0	
2018 AM																									
Complete	2657.8	2286.8	205.6	165.4	6328	8907.8	4330.8	6568.2	590.2	456.6	0	0	0	0	0	3986.6	1.5	3.352	1.628	29.23	0.968	1.762	1.754	1.696	
Incomplete	111.4	96	7.4	8	180.26	275.3	118.664	221.2	13.6	14	566.16	265.98	391.94	14.552	14.928	238.48	2.136	5.06	2.388	28.444	2.678	2.21	1.666	1.728	
Total	2769.2	2382.8	213	173.4	6508.4	9183	4449.6	6789.4	603.8	470.6	9473.8	4596.6	6960.2	604.74	471.52	4224.8	0	0	0	0	0	0	0	0	
2028 AM																									
Complete	2471.4	2147	179.4	145	5407.4	17072.6	3771	14219.6	1056.6	808.8	0	0	0	0	0	6606.4	2.716	7.074	1.522	13.434	4.888	4.36	3.924	3.708	
Incomplete	294.8	258.2	19.8	16.8	412.22	2662.6	261.24	1806.4	139.4	107	5258.4	708.06	3735.2	148.568	111.444	1788.04	5.856	17.012	2.406	9.038	14.832	7.884	7.796	7.156	
Total	2766.2	2405.2	199.2	161.8	5819.4	19735.4	4032.2	16026	1196	915.8	22331.4	4479.2	17954.8	1205.2	920.22	8394.4	0	0	0	0	0	0	0	0	

appendix

17:00 - 17:15

Existing	Measured Totals										Estimated Totals						Resultant Derived Averages (per vehicle)							
	All	Cars	Light	Heavy	Freeflow Time (min)	Trip Time (min)	Distance (km)	Cars	Light	Heavy	Time (min)	Distance (km)	Cars	Light	Heavy	Total Cost(\$)	Cost(\$)	Trip Time (min)	Distance (km)	Speed (km/h)	Delay (min)	Cars	Light	Heavy
	Complete	Incomplete	Total																					
2013 AM	Complete	1225.4	1057.2	88.8	79.4	3073.6	3814.4	2104.8	2616.8	219	187.2	0	0	0	0	1743.6	1.424	3.114	1.718	33.412	0.604	1.444	1.436	1.376
	Incomplete	112	93.4	9.2	9.4	166.46	248.06	110.34	193.8	18.2	21.4	516.26	259.68	332.96	19.45	18.846	223.54	1.968	4.532	2.316	31.026	2.024	2.068	1.944
	Total	1337.4	1150.6	98	88.8	3240	4062.4	2215	2810.6	237.2	208.6	4330.6	2364.6	2949.8	238.44	206.04	1967	0	0	0	0	0	0	0
2018 AM	Complete	1283.8	1106.8	103.2	73.8	3107.4	4932.2	2139.4	3948.8	348.6	255.2	0	0	0	2171	1.688	3.84	1.668	26.224	1.418	2.132	2.022	2.038	
	Incomplete	144.8	121.6	13.2	10	234.08	464.3	152.84	348	39.4	27.6	903.78	339.52	638.08	40.928	27.648	366.82	2.506	6.142	2.344	23.466	3.722	2.734	2.856
	Total	1428.6	1228.4	116.4	83.8	3341.6	5396.6	2292.4	4296.8	388	282.8	5836.4	2479	4587.2	389.54	282.82	2537.8	0	0	0	0	0	0	0
2028 AM	Complete	873.6	768.6	65.4	39.6	1819.5	5664.8	1277.18	5436.6	358	247	0	0	0	2238.16	2.468	6.52	1.332	12.51	4.644	4.684	3.746	3.808	
	Incomplete	355.6	310.8	25.8	19	488.42	5744.6	313.36	2159.2	198	121.8	4452.2	534.148	3084.36	129.558	71.748	1485.94	4.422	13.142	1.614	6.76	11.27	7.938	9.084
	Total	1229.2	1079.4	91.2	58.6	2308.04	11409.2	1590.92	7595.8	556	368.8	10117	1811.4	8521	487.558	318.75	3723.96	0	0	0	0	0	0	0

17:15 - 17:30

Existing	Measured Totals										Estimated Totals						Resultant Derived Averages (per vehicle)							
	All	Cars	Light	Heavy	Freeflow Time (min)	Trip Time (min)	Distance (km)	Cars	Light	Heavy	Time (min)	Distance (km)	Cars	Light	Heavy	Total Cost(\$)	Cost(\$)	Trip Time (min)	Distance (km)	Speed (km/h)	Delay (min)	Cars	Light	Heavy
	Complete	Incomplete	Total																					
2013 AM	Complete	2453	2102.4	187.4	163.2	6147.2	7885.6	4209.2	5523	502.8	396.2	0	0	0	3593.2	1.464	3.214	1.716	32.238	0.708	1.53	1.554	1.406	
	Incomplete	98	81.6	8.8	7.6	141.88	220.1	94.468	201.4	25.8	16.6	494.88	237.62	351.28	27.022	16.742	215.24	2.192	5.04	2.428	29.26	2.534	2.592	3.15
	Total	2551	2184	196.2	170.8	6289.2	8105.8	4303.6	5724.4	528.6	412.8	8380.4	4447	5874.4	529.84	412.94	3808.2	0	0	0	0	0	0	0
2018 AM	Complete	2568.2	2211.4	208	148.8	6159	10674.4	4243.4	8904.4	810.6	542.2	0	0	0	4638.8	1.806	4.158	1.654	24.012	1.758	2.434	2.356	2.196	
	Incomplete	146	123.8	9.6	12.6	275.1	548.94	176.44	535.2	27.6	43.2	1029.98	358.08	878.7	29.952	45.2	421.64	2.876	7.012	2.452	21.234	4.612	3.596	2.188
	Total	2714.2	2335.2	217.6	161.4	6434.2	11222.8	4419.8	9439.6	838.2	585.4	11704.4	4601.4	9783.2	840.54	587.4	5060.2	0	0	0	0	0	0	0
2028 AM	Complete	1526.6	1334.8	116.6	75.2	3109.82	11716.6	2188.62	10159.2	732.8	488.6	0	0	0	4439.88	2.828	7.884	1.3	10.482	6.056	5.042	4.212	3.898	
	Incomplete	386.2	339.8	27	19.4	525.86	9441.4	339.8	2851	240.6	159.8	6843.8	607.34	4181.44	167.688	106.106	2186.82	5.804	18.098	1.626	4.788	16.272	9.618	10.444
	Total	1912.8	1674.6	143.6	94.6	3635.58	21157.8	2528.4	13010.2	973.4	648.4	18560.2	2796.02	14340.6	900.66	594.73	6626.8	0	0	0	0	0	0	0

17:30 - 17:45

Existing	Measured Totals										Estimated Totals						Resultant Derived Averages (per vehicle)							
	All	Cars	Light	Heavy	Freeflow Time (min)	Trip Time (min)	Distance (km)	Cars	Light	Heavy	Time (min)	Distance (km)	Cars	Light	Heavy	Total Cost(\$)	Cost(\$)	Trip Time (min)	Distance (km)	Speed (km/h)	Delay (min)	Cars	Light	Heavy
	Complete	Incomplete	Total																					
2013 AM	Complete	1148	987.8	89	71.2	2946.8	3603.4	2010.2	2470.6	229.6	154.4	0	0	0	1649.6	1.436	3.138	1.75	33.548	0.568	1.424	1.48	1.252	
	Incomplete	84.8	72.8	7.2	4.8	135.94	177.38	88.746	138.4	18	6.6	388.34	203.64	248.06	18.764	7.01	168.4	1.97	4.538	2.4	32.104	1.972	1.79	2.194
	Total	1232.8	1060.6	96.2	76	3082.6	3781	2099	2609	247.6	161	3991.6	2213.8	2718.6	248.36	161.42	1818	0	0	0	0	0	0	0
2018 AM	Complete	1251	1084	89.4	77.6	3180.6	5833.4	2177.2	5300.6	376.2	335.2	0	0	0	2526.4	2.016	4.656	1.742	22.626	2.114	2.802	2.41	2.478	
	Incomplete	122.2	104.8	8.8	8.6	211.6	377.72	138.032	283	15.8	22.6	810.34	293.58	618.12	19.028	21.42	323.48	2.652	6.668	2.388	21.61	4.128	2.438	
	Total	1373.2	1188.8	98.2	86.2	3392.4	6211	2315.2	5583.6	392	357.8	6643.6	2470.6	5918.8	395.24	356.62	2849.4	0	0	0	0	0	0	0
2028 AM	Complete	624.6	540.6	52.8	31.2	1130.276	7032.6	813.72	5037.4	428.6	235.8	0	0	0	2452.16	4.058	13.002	0.984	4.68	11.64	5.606	4.458	5.002	
	Incomplete	416.4	364.8	26.4	25.2	593.82	13823.4	387.1	3106.2	269.2	187.4	9094.8	575.368	4310.86	176.84	120.08	2750.9	6.62	21.874	1.386	2.748	20.512	9.146	11.044
	Total	1041	905.4	79.2	56.4	1724.26	20856	1200.9	8143.6	697.8	423.2	16127.6	1389.02	9348.26	605.3	355.88	5203	0	0	0	0	0	0	0

appendix

17:45 - 18:00

Existing	Measured Totals											Estimated Totals					Resultant Derived Averages (per vehicle)								
					Freeflow	Trip Time	Distance				Time	Distance				Total			Trip Time	Distance	Speed	Delay			
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy	
Complete																									
Incomplete																									
Total																									
2013 AM	Complete	2265	1940.8	180.4	143.8	5819.4	6831	3971.4	4490	428.4	303.4	0	0	0	0	0	3156	1.392	3.014	1.752	34.954	0.446	1.32	1.354	1.208
	Incomplete	78	65.4	7.2	5.4	126.3	149.38	82.87	99.6	13.2	10	333.48	189.38	192.88	14.04	10.448	147.96	1.898	4.28	2.43	34.168	1.71	1.45	1.602	1.748
	Total	2343	2006.2	187.6	149.2	5945.8	6980.4	4054.2	4589.6	441.6	313.4	7164.6	4160.6	4682.8	442.46	313.86	3303.8	0	0	0	0	0	0	0	0
2018 AM	Complete	2503.6	2167.4	185.2	151	6328	10808.6	4332.4	9099.8	701.6	582	0	0	0	0	4693	1.874	4.316	1.73	24.22	1.788	2.422	2.188	2.234	
	Incomplete	95.4	82.8	7.4	5.2	164.08	228.2	107.148	167.8	17.8	11	514.92	230.58	366.84	18.958	11.492	215.48	2.246	5.362	2.418	27.226	2.832	1.804	2.444	1.82
	Total	2599	2250.2	192.6	156.2	6492.4	11036.6	4439.6	9267.6	719.4	593	11323.6	4563	9466.4	720.56	593.5	4908.8	0	0	0	0	0	0	0	0
2028 AM	Complete	1180.4	1019.6	95	65.8	2284.16	16494	1626.478	11233.2	949.6	562.4	0	0	0	0	5635	4.778	15.526	0.992	4.018	14.154	6.346	5.606	5.62	
	Incomplete	428	377.8	26.6	23.6	589.36	17007.4	382.16	3371.8	255	185.6	10196.4	588.26	4614	153.5	115.22	3038	7.112	23.87	1.374	2.55	22.498	9.902	10.854	8.852
	Total	1608.4	1397.4	121.6	89.4	2873.54	33501.8	2008.48	14605	1204.6	748	26690.6	2214.5	15847.2	1103	677.46	8673.2	0	0	0	0	0	0	0	0

18:00 - 18:15

Existing	Measured Totals											Estimated Totals					Resultant Derived Averages (per vehicle)								
					Freeflow	Trip Time	Distance				Time	Distance				Total			Trip Time	Distance	Speed	Delay			
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy	
Complete																									
Incomplete																									
Total																									
2013 AM	Complete	946.8	821.4	74.2	51.2	2459.4	2596.8	1671.2	1330.4	117.6	87.6	0	0	0	0	1193	1.262	2.744	1.766	38.622	0.146	0.918	0.894	0.964	
	Incomplete	70.2	57.2	7.2	5.8	114.01	121.66	75.716	62	8	5.8	259.7	165.08	108.334	8.736	5.16	115.12	1.64	3.698	2.352	38.182	1.1	1.004	1.108	0.918
	Total	1017	878.6	81.4	57	2573.4	2718.6	1746.8	1392.4	125.6	93.4	2856.4	1836	1438.8	126.34	92.762	1307.8	0	0	0	0	0	0	0	0
2018 AM	Complete	1090.2	940.8	86.4	63	2780.8	3447.4	1896.2	2200.2	196.2	134.8	0	0	0	0	1550.4	1.418	3.154	1.742	33.432	0.602	1.338	1.306	1.228	
	Incomplete	75.6	64.8	4.2	6.6	121.04	133.82	80.796	87.2	2.8	6	291.26	177.02	159.96	3.172	6.376	128.18	1.696	3.852	2.342	36.462	1.304	1.272	0.758	0.972
	Total	1165.8	1005.6	90.6	69.6	2902	3581	1976.6	2287.4	199	140.8	3738.4	2073	2360.2	199.36	141.18	1678.4	0	0	0	0	0	0	0	0
2028 AM	Complete	318.6	278.6	21.8	18.2	732.84	4739.8	505.14	3605.2	215.4	211.6	0	0	0	0	1656.6	2.404	7.184	0.568	2.034	6.37	4.08	3.788	4.01	
	Incomplete	434.4	384.6	27.4	22.4	583.38	21967.4	377.26	3263.6	249.2	164.4	3669.6	214.98	2015.8	47.97	34.676	1112.4	2.848	9.274	0.594	1.408	8.458	9.606	10.326	8.762
	Total	753	663.2	49.2	40.6	1316.12	26707.4	882.44	6868.8	464.6	376	8409.4	720.2	5621	263.28	246.38	2769.2	0	0	0	0	0	0	0	0

18:15 - 18:30

Existing	Measured Totals											Estimated Totals					Resultant Derived Averages (per vehicle)								
					Freeflow	Trip Time	Distance				Time	Distance				Total			Trip Time	Distance	Speed	Delay			
	All	Cars	Light	Heavy	Time (min)	(min)	(km)	Cars	Light	Heavy	(min)	(km)	Cars	Light	Heavy	Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy	
Complete																									
Incomplete																									
Total																									
2013 AM	Complete	1749.4	1517.4	133.8	98.2	4474.6	4629.4	3040.8	2141.8	189.6	145.4	0	0	0	0	2118	1.21	2.644	1.738	39.416	0.088	0.81	0.814	0.854	
	Incomplete	55.8	45.4	5.8	4.6	93.766	98.126	62.266	50.6	6.4	4.4	208.78	134.66	84.224	7.036	4.482	92.98	1.666	3.74	2.416	38.74	1.184	1.002	1.068	0.966
	Total	1805.2	1562.8	139.6	102.8	4568.4	4727.6	3103	2192.4	196	149.8	4838	3175.4	2226	196.64	149.88	2210.8	0	0	0	0	0	0	0	0
2018 AM	Complete	1987.4	1715.4	154.2	117.8	4935.6	5650	3370.8	3216	279.4	200.6	0	0	0	0	2561.6	1.284	2.838	1.694	35.994	0.356	1.104	1.07	1.002	
	Incomplete	57.4	49.6	4.6	3.2	88.832	93.36	58.918	45	2.8	3.6	214.14	133.68	98.272	3.144	3.866	93.748	1.634	3.734	2.332	37.494	1.25	0.886	0.462	1.024
	Total	2044.8	1765	158.8	121	5024.4	5743.6	3429.6	3261	282.2	204.2	5864.4	3504.4	3314.2	282.56	204.46	2655.4	0	0	0	0	0	0	0	0
2028 AM	Complete	613.6	532	42.8	38.8	1464.44	7592.6	999.74	5877.6	363.6	336.8	0	0	0	0	2710.2	2.256	6.716	0.576	2.328	5.888	3.824	3.612	3.632	
	Incomplete	412.8	366.8	24.8	21.2	547.76	27174	355.04	2982.6	224	144.6	3308.4	166.82	1473.8	22.574	13.148	962.4	2.668	8.878	0.606	1.552	8.05	8.868	9.6	7.336
	Total	1026.4	898.8	67.6	60	2012.12	34766.8	1354.84	8860.2	587.6	481.4	10901	1166.6	7351.4	386.08	349.98	3672.8	0	0	0	0	0	0	0	0

appendix

18:30 - 18:45

Existing	Measured Totals											Estimated Totals					Resultant Derived Averages (per vehicle)									
	All	Cars	Light	Heavy	Freeflow	Trip Time	Distance	Cars	Light	Heavy	Time	Distance	Cars	Light	Heavy	Total	Cost(\$)	Cost(\$)	Trip Time	Distance	Speed	Delay	Cars	Light	Heavy	
	Time (min)	(min)	(km)		(min)	(min)	(km)				(min)	(km)				Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy		
Complete																										
Incomplete																										
Total																										
2013 AM	Complete	728.2	632.2	53.8	42.2	1846.4	1849	1256.4	696.8	57.8	51.2	0	0	0	0	838.74	1.152	2.54	1.726	40.768	0.004	0.64	0.63	0.704		
	Incomplete	50.8	41.4	5	4.4	98.206	98.908	64.06	45	4	4.8	175.72	116.08	61.466	3.83	64.54	78.06	1.534	3.452	2.282	39.702	0.914	0.844	0.77	0.76	
	Total	779	673.6	58.8	46.6	1944.6	1948	1320.4	741.8	61.8	56	2024.8	1372.6	758.26	61.63	55.74	916.8	0	0	0	0	0	0	0	0	
2018 AM	Complete	798.6	690.6	59.4	48.6	1906.4	1919.2	1306.4	768.2	63.4	60.4	0	0	0	0	877.6	1.1	2.404	1.634	40.842	0.014	0.682	0.648	0.756		
	Incomplete	55.8	48.6	4.4	2.8	88.468	92.994	60.076	43	4.4	3.4	195.28	129.06	70.938	4.584	3.554	86.46	1.548	3.5	2.312	39.636	1.11	0.834	0.86	1.188	
	Total	854.4	739.2	63.8	51.4	1994.8	2012.4	1366.6	811.2	67.8	63.8	2114.8	1435.6	839.14	67.984	63.954	964.1	0	0	0	0	0	0	0	0	
2028 AM	Complete	255	222.8	19.4	12.8	652.6	1764.6	441.4	1367.2	61.6	36.2	0	0	0	0	659.2	0.516	1.384	0.346	3.002	0.872	0.708	0.366	0.326		
	Incomplete	405.2	359.4	25.2	20.6	531.54	32653.38	345.68	2913.2	221.6	141.6	376.4	72.8	294.8	2.824	0.94	130.54	0.894	2.578	0.498	2.32	2.066	8.672	9.064	6.982	
	Total	660.2	582.2	44.6	33.4	1184.26	34418	787.1	4280.4	283.2	177.8	2141.2	514.2	1662	64.42	37.14	789.6	0	0	0	0	0	0	0	0	

18:45 - 19:00

Existing	Measured Totals											Estimated Totals					Resultant Derived Averages (per vehicle)									
	All	Cars	Light	Heavy	Freeflow	Trip Time	Distance	Cars	Light	Heavy	Time	Distance	Cars	Light	Heavy	Total	Cost(\$)	Cost(\$)	Trip Time	Distance	Speed	Delay	Cars	Light	Heavy	
	Time (min)	(min)	(km)		(min)	(min)	(km)				(min)	(km)				Cost(\$)	Cost(\$)	(min)	(km)	(km/h)	(min)	Cars	Light	Heavy		
Complete																										
Incomplete																										
Total																										
2013 AM	Complete	1413.6	1218.8	112.6	82.2	3591.8	3590.6	2440.4	1297.6	117.8	94.4	0	0	0	0	1625.2	1.15	2.54	1.726	40.784	0	0.618	0.606	0.664		
	Incomplete	47.8	39.8	3.6	4.4	90.68	90.018	59.064	33.2	1.8	2.2	168.78	112.31	52.55	1.948	2.302	73.558	1.538	3.53	2.348	39.92	0.99	0.654	0.334	0.418	
	Total	1461.4	1258.6	116.2	86.6	3682.4	3680.2	2499.6	1330.8	119.6	96.6	3759	2553	1350	119.76	96.714	1698.6	0	0	0	0	0	0	0	0	
2018 AM	Complete	1551.4	1346.6	114.4	90.4	3765.6	3782.2	2574.4	1480.8	123.2	108	0	0	0	0	1722.6	1.112	2.438	1.66	40.84	0.012	0.662	0.648	0.72		
	Incomplete	48.6	40.4	4.4	3.8	80.008	83.416	54.066	34.2	4.4	4	170.04	112.71	58.308	4.674	4.118	75.698	1.554	3.492	2.314	39.788	1.064	0.738	0.96	0.746	
	Total	1600	1387	118.8	94.2	3845.8	3865.8	2628.2	1515	127.6	112	3952.2	2686.8	1538.8	127.872	112.118	1798.6	0	0	0	0	0	0	0	0	
2028 AM	Complete	476.4	421.8	33.6	21	1259.6	2819.6	851.8	2181.8	121.6	50.4	0	0	0	0	1091.6	0.458	1.184	0.358	3.626	0.654	0.578	0.404	0.268		
	Incomplete	399	346.4	31	21.6	521.02	38247.08	339.072	2867	237.4	142.8	233	56.52	112.06	20.44	2.06	84.34	0.734	2.026	0.492	2.91	1.498	8.742	9.316	6.874	
	Total	875.4	768.2	64.6	42.6	1780.66	41066.8	1190.9	5048.8	359	193.2	3052.8	908.4	2293.8	142.04	52.46	1175.8	0	0	0	0	0	0	0	0	

Appendix D

Future Year Land Use Traffic Generation

appendix

Year	Area	Size			Peak PM Gen AM (PM)		Source	Pk Hr Gen AM (PM)
2013	A	500	sqm	Retail	2 (10)	/100sqm LFA	GTA Rate	10 (50)
	B	400	sqm	Commercial	2 (2)	/100sqm GFA	RTA 3.5	8 (8)
		100	sqm	Retail	2 (10)	/100sqm LFA	GTA Rate	2 (10)
	C	3000	sqm	Light Ind / Bulky	0.5 (2.5)	/100sqm GLFA of Bulky	RTA 3.6.8	15 (75)
	D	250	lots	Res Lots	0.85 (0.85)	/dwelling	RTA Table 3.7	213 (213)
		200	sqm	Retail	2 (10)	/100sqm LFA	GTA Rate	4 (20)
		80	sqm	Commercial	2 (2)	/100sqm GFA	RTA 3.5	2 (2)
	E	150	lots	Res Lots	0.85 (0.85)	/dwelling	RTA Table 3.7	128 (128)
Total								381 (505)

Year	Area	Size			Peak PM Gen AM (PM)		Source	Pk Hr Gen AM (PM)
2018	A	1000	sqm	Retail	2 (10)	/100sqm LFA	GTA Rate	20 (100)
	B	1600	sqm	Commercial	2 (2)	/100sqm GFA	RTA 3.5	32 (32)
		400	sqm	Retail	2 (10)	/100sqm LFA	GTA Rate	8 (40)
	C	10000	sqm	Light Ind / Bulky	0.5 (2.5)	/100sqm GLFA of Bulky	RTA 3.6.8	50 (250)
	D	400	lots	Res Lots	0.85 (0.85)	/dwelling	RTA Table 3.7	340 (340)
		300	sqm	Retail	2 (10)	/100sqm LFA	GTA Rate	6 (30)
		120	sqm	Commercial	2 (2)	/100sqm GFA	RTA 3.5	2 (2)
	E	300	lots	Res Lots	0.85 (0.85)	/dwelling	RTA Table 3.7	255 (255)
Total								713 (1049)

appendix

Year	Area	Size			Peak PM Gen AM (PM)		Source	Pk Hr Gen AM (PM)
2028	A	2000	sqm	Retail	2 (10)	/100sqm LFA	GTA Rate	40 (200)
	B	3200	sqm	Commercial	2 (2)	/100sqm GFA	RTA 3.5	64 (64)
		800	sqm	Retail	2 (10)	/100sqm LFA	GTA Rate	16 (80)
	C	14000	sqm	Light Ind / Bulky	0.5 (2.5)	/100sqm GLFA of Bulky	RTA 3.6.8	70 (350)
	D	700	lots	Res Lots	0.85 (0.85)	/dwelling	RTA Table 3.7	595 (595)
		400	sqm	Retail	2 (10)	/100sqm LFA	GTA Rate	8 (40)
		180	sqm	Commercial	2 (2)	/100sqm GFA	RTA 3.5	4 (4)
	E	600	lots	Res Lots	0.85 (0.85)	/dwelling	RTA Table 3.7	510 (510)
	Total							

Appendix E

Options Testing – Travel Time Summary

Existing Model	Travel Time (seconds)				Counts			
	Existing AM	2013 AM	2018 AM	2028 AM	Existing AM	2013 AM	2018 AM	2028 AM
7 to 730								
Reid Street to Villers Street NB	210	210	210	210	57	57	57	60
Villers Street to Reid Street SB	202	200	202	206	26	29	32	32
Bent Street NB	180	178	180	180	208	216	211	216
Bent Street SB	170	170	170	170	144	154	158	175
Bligh Street to Villers Street NB	190	190	190	192	35	50	50	47
Villers Street to Bligh Street SB	192	190	190	190	23	23	22	25
Spring St to Bent St via Gwydir WB	23	23	23	23	41	49	59	67
Bent St to Pacific Hwy via Gwydir EB	19	18	19	20	39	46	51	54
Spring St to Villers St via Gwydir NB	210	208	206	210	20	15	18	17
Villers St to Spring via Gwydir SB	190	192	192	198	16	18	21	31
Wharf Street to Bent Street EB	20	20	20	20	88	85	81	85
Bent Street to Wharf Street WB	20	20	20	20	25	28	38	38
Total	1625	1619	1621	1639	724	772	797	845
730 to 8								
Location 5pm to 6pm	Existing AM	2013 AM	2018 AM	2028 AM	Existing AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	224	222	230	236	76	80	79	80
Villers Street to Reid Street SB	208	206	210	218	35	42	46	45
Bent Street NB	182	184	186	190	352	358	361	389
Bent Street SB	172	174	172	176	225	240	234	256
Bligh Street to Villers Street NB	196	200	202	210	57	80	80	91
Villers Street to Bligh Street SB	194	198	194	194	29	35	34	33
Spring St to Bent St via Gwydir WB	27	26	30	39	81	85	105	123
Bent St to Pacific Hwy via Gwydir EB	20	20	22	27	54	71	72	70
Spring St to Villers St via Gwydir NB	218	216	222	228	39	32	33	33
Villers St to Spring via Gwydir SB	194	196	200	200	28	32	35	41
Wharf Street to Bent Street EB	20	21	21	21	73	80	81	90
Bent Street to Wharf Street WB	20	20	20	20	45	49	61	57
Total	1676	1682	1708	1759	1095	1184	1221	1308
8 to 830								
Location 6pm to 7pm	Existing AM	2013 AM	2018 AM	2028 AM	Existing AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	306	384	410	452	92	77	81	84
Villers Street to Reid Street SB	214	220	228	326	49	59	55	47
Bent Street NB	246	326	340	366	442	458	443	453
Bent Street SB	176	180	180	184	261	284	287	256
Bligh Street to Villers Street NB	274	350	358	402	70	91	94	99
Villers Street to Bligh Street SB	192	200	198	200	49	46	49	42
Spring St to Bent St via Gwydir WB	59	70	75	115	164	143	145	162
Bent St to Pacific Hwy via Gwydir EB	25	29	35	119	71	83	80	72
Spring St to Villers St via Gwydir NB	318	414	438	524	89	70	71	67
Villers St to Spring via Gwydir SB	200	200	200	242	38	29	35	35
Wharf Street to Bent Street EB	29	83	101	214	110	118	126	122
Bent Street to Wharf Street WB	20	20	20	20	69	62	76	76
Total	2058	2476	2583	3163	1503	1522	1541	1516
830 to 9								
Location 6pm to 7pm	Existing AM	2013 AM	2018 AM	2028 AM	Existing AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	526	668	686	664	79	84	91	77
Villers Street to Reid Street SB	288	496	484	870	49	46	55	75
Bent Street NB	430	546	546	548	437	464	475	468
Bent Street SB	182	214	220	626	279	255	282	291
Bligh Street to Villers Street NB	456	698	764	816	73	79	81	69
Villers Street to Bligh Street SB	200	216	224	640	57	47	51	51
Spring St to Bent St via Gwydir WB	129	214	196	164	174	185	180	195
Bent St to Pacific Hwy via Gwydir EB	75	292	240	248	68	64	77	100
Spring St to Villers St via Gwydir NB	548	748	758	722	98	103	98	123
Villers St to Spring via Gwydir SB	250	432	414	796	33	28	35	33
Wharf Street to Bent Street EB	324	722	718	716	93	89	95	97
Bent Street to Wharf Street WB	20	20	20	20	75	72	75	74
Total	3428	5266	5270	6830	1518	1515	1596	1654
9 to 930								
Location 6pm to 7pm	Existing AM	2013 AM	2018 AM	2028 AM	Existing AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	574	630	604	634	88	86	94	76
Villers Street to Reid Street SB	210	274	302	432	58	74	78	85
Bent Street NB	498	556	540	542	513	501	498	483
Bent Street SB	172	178	208	280	247	302	297	363
Bligh Street to Villers Street NB	634	830	832	782	85	77	67	89
Villers Street to Bligh Street SB	194	234	234	298	47	55	48	70
Spring St to Bent St via Gwydir WB	45	86	63	63	94	122	126	125
Bent St to Pacific Hwy via Gwydir EB	21	33	41	50	78	99	109	125
Spring St to Villers St via Gwydir NB	670	736	672	710	68	83	81	64
Villers St to Spring via Gwydir SB	198	242	318	416	21	28	32	46
Wharf Street to Bent Street EB	578	892	804	766	83	76	92	106
Bent Street to Wharf Street WB	20	20	20	20	46	52	53	70
Total	3814	4710	4638	4993	1427	1556	1573	1702
930 to 10								
Location 6pm to 7pm	Existing AM	2013 AM	2018 AM	2028 AM	Existing AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	344	580	560	576	80	92	86	95
Villers Street to Reid Street SB	208	210	212	234	60	56	61	56
Bent Street NB	312	546	524	534	452	525	520	529
Bent Street SB	174	172	176	176	252	246	271	260
Bligh Street to Villers Street NB	330	686	656	778	80	98	112	86
Villers Street to Bligh Street SB	200	194	198	200	47	49	52	50
Spring St to Bent St via Gwydir WB	26	30	34	50	89	104	110	143
Bent St to Pacific Hwy via Gwydir EB	21	22	25	36	80	86	106	98
Spring St to Villers St via Gwydir NB	334	574	548	582	48	47	50	51
Villers St to Spring via Gwydir SB	198	194	198	200	19	20	29	24
Wharf Street to Bent Street EB	23	1014	722	814	89	80	117	95
Bent Street to Wharf Street WB	20	20	20	20	39	42	50	51
Total	2190	4242	3873	4200	1335	1446	1564	1537

Existing + Additional bridge Capacity	Travel Time (seconds)			Counts		
	2013 AM	2018 AM	2028 AM	2013 AM	2018 AM	2028 AM
7 to 730						
Reid Street to Villers Street NB	200	198	198	69	63	63
Villers Street to Reid Street SB	200	200	202	25	26	38
Bent Street NB	160	160	160	217	211	213
Bent Street SB	170	170	170	145	152	175
Bligh Street to Villers Street NB	170	170	174	47	40	45
Villers Street to Bligh Street SB	190	190	190	21	23	23
Spring St to Bent St via Gwydir WB	24	24	25	48	57	69
Bent St to Pacific Hwy via Gwydir EB	19	18	20	39	42	56
Spring St to Villers St via Gwydir NB	192	194	196	18	16	14
Villers St to Spring via Gwydir SB	190	190	190	20	23	30
Wharf Street to Bent Street EB	8	8	9	77	78	85
Bent Street to Wharf Street WB	8	9	9	26	35	40
Total	1531	1531	1542	752	767	850
730 to 8						
Location 5pm to 6pm	2013 AM	2018 AM	2028 AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	206	206	212	88	88	88
Villers Street to Reid Street SB	200	202	210	43	43	59
Bent Street NB	160	162	162	367	363	368
Bent Street SB	170	170	170	233	247	267
Bligh Street to Villers Street NB	180	180	180	80	78	81
Villers Street to Bligh Street SB	190	190	190	33	35	35
Spring St to Bent St via Gwydir WB	32	30	34	93	98	127
Bent St to Pacific Hwy via Gwydir EB	21	22	26	73	62	88
Spring St to Villers St via Gwydir NB	204	200	206	34	30	33
Villers St to Spring via Gwydir SB	190	190	190	31	37	43
Wharf Street to Bent Street EB	10	10	10	78	79	88
Bent Street to Wharf Street WB	8	9	9	48	55	63
Total	1570	1570	1598	1202	1216	1340
8 to 830						
Location 6pm to 7pm	2013 AM	2018 AM	2028 AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	242	260	282	110	109	113
Villers Street to Reid Street SB	214	260	298	56	52	55
Bent Street NB	170	170	170	534	532	535
Bent Street SB	170	170	172	289	276	250
Bligh Street to Villers Street NB	192	194	206	93	91	100
Villers Street to Bligh Street SB	190	190	214	49	46	41
Spring St to Bent St via Gwydir WB	69	114	150	144	144	161
Bent St to Pacific Hwy via Gwydir EB	26	63	113	78	82	83
Spring St to Villers St via Gwydir NB	244	290	328	85	87	86
Villers St to Spring via Gwydir SB	194	206	254	38	32	32
Wharf Street to Bent Street EB	16	20	30	205	209	222
Bent Street to Wharf Street WB	9	9	9	75	76	79
Total	1735	1945	2225	1757	1737	1756
830 to 9						
Location 6pm to 7pm	2013 AM	2018 AM	2028 AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	294	316	286	107	112	100
Villers Street to Reid Street SB	342	588	802	62	66	61
Bent Street NB	170	172	172	577	564	540
Bent Street SB	172	354	632	303	294	281
Bligh Street to Villers Street NB	198	256	320	115	98	97
Villers Street to Bligh Street SB	196	388	662	53	51	51
Spring St to Bent St via Gwydir WB	156	150	144	174	189	176
Bent St to Pacific Hwy via Gwydir EB	122	220	190	90	107	102
Spring St to Villers St via Gwydir NB	336	344	326	113	118	112
Villers St to Spring via Gwydir SB	266	500	782	42	35	39
Wharf Street to Bent Street EB	18	24	58	172	182	205
Bent Street to Wharf Street WB	9	9	9	74	79	80
Total	2279	3321	4383	1882	1896	1845
9 to 930						
Location 6pm to 7pm	2013 AM	2018 AM	2028 AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	212	216	258	100	95	99
Villers Street to Reid Street SB	208	214	650	59	73	90
Bent Street NB	164	170	170	459	492	507
Bent Street SB	170	172	426	259	298	376
Bligh Street to Villers Street NB	182	196	248	65	90	101
Villers Street to Bligh Street SB	190	192	502	51	57	66
Spring St to Bent St via Gwydir WB	38	32	78	102	107	136
Bent St to Pacific Hwy via Gwydir EB	22	26	88	86	113	148
Spring St to Villers St via Gwydir NB	232	246	298	50	56	62
Villers St to Spring via Gwydir SB	190	196	538	24	34	47
Wharf Street to Bent Street EB	11	11	22	81	95	122
Bent Street to Wharf Street WB	9	9	9	41	50	65
Total	1627	1680	3286	1376	1559	1820
930 to 10						
Location 6pm to 7pm	2013 AM	2018 AM	2028 AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	206	202	204	94	83	80
Villers Street to Reid Street SB	206	208	214	59	60	61
Bent Street NB	162	164	164	407	378	407
Bent Street SB	170	170	170	253	253	293
Bligh Street to Villers Street NB	180	180	190	58	60	68
Villers Street to Bligh Street SB	190	190	192	45	46	58
Spring St to Bent St via Gwydir WB	28	28	29	100	103	121
Bent St to Pacific Hwy via Gwydir EB	21	22	28	84	93	114
Spring St to Villers St via Gwydir NB	204	200	202	46	41	42
Villers St to Spring via Gwydir SB	190	192	192	22	28	35
Wharf Street to Bent Street EB	10	10	11	129	134	147
Bent Street to Wharf Street WB	9	9	9	38	48	48
Total	1576	1574	1604	1335	1328	1474

Existing Model		Counts				Travel Time (seconds)			
	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM	
1600-1630									
Reid Street to Villers Street NB	43	45	39	53	270	430	426	412	
Villers Street to Reid Street SB	46	41	41	28	272	418	444	592	
Bent Street NB	275	301	300	338	188	194	192	218	
Bent Street SB	402	382	382	316	240	266	298	322	
Bligh Street to Villers Street NB	65	70	64	65	204	210	212	244	
Villers Street to Bligh Street SB	90	96	89	71	262	284	316	342	
Spring St to Bent St via Gwydir WB	51	79	80	102	75	256	194	178	
Bent St to Pacific Hwy via Gwydir EB	81	78	79	62	20	69	68	194	
Spring St to Villers St via Gwydir NB	15	30	34	43	260	498	414	428	
Villers St to Spring via Gwydir SB	37	35	31	23	264	356	378	504	
Wharf Street to Bent Street EB	51	50	55	55	21	22	23	24	
Bent Street to Wharf Street WB	74	69	59	62	20	20	20	20	
Total	1231	1275	1253	1218	2097	3023	2985	3478	
1630-1700									
	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM	
Reid Street to Villers Street NB	44	48	43	26	278	436	490	188	
Villers Street to Reid Street SB	64	52	51	35	344	456	660	396	
Bent Street NB	283	303	323	328	190	192	204	100	
Bent Street SB	463	456	436	452	312	348	446	264	
Bligh Street to Villers Street NB	73	72	72	47	202	206	228	142	
Villers Street to Bligh Street SB	109	113	109	62	336	372	472	278	
Spring St to Bent St via Gwydir WB	64	76	108	63	76	334	250	54	
Bent St to Pacific Hwy via Gwydir EB	104	95	95	74	20	48	174	162	
Spring St to Villers St via Gwydir NB	22	37	45	32	284	516	482	196	
Villers St to Spring via Gwydir SB	42	43	37	32	336	434	592	404	
Wharf Street to Bent Street EB	63	67	72	44	22	22	23	23	
Bent Street to Wharf Street WB	72	68	67	35	20	20	20	8	
Total	1294	1330	1364	1168	2421	3384	4041	2215	
1700-1730									
Location 6pm to 7pm	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM	
Reid Street to Villers Street NB	43	52	59	65	294	472	462	188	
Villers Street to Reid Street SB	67	59	60	21	360	480	692	396	
Bent Street NB	297	316	340	355	194	204	210	100	
Bent Street SB	411	423	423	0	328	370	528	264	
Bligh Street to Villers Street NB	78	82	82	43	212	220	232	142	
Villers Street to Bligh Street SB	100	105	110	29	348	390	562	278	
Spring St to Bent St via Gwydir WB	74	104	107	119	87	282	298	54	
Bent St to Pacific Hwy via Gwydir EB	123	121	118	57	21	71	135	162	
Spring St to Villers St via Gwydir NB	35	42	42	36	296	524	542	196	
Villers St to Spring via Gwydir SB	27	35	38	11	348	462	646	404	
Wharf Street to Bent Street EB	106	126	179	122	22	23	30	23	
Bent Street to Wharf Street WB	117	111	105	38	20	20	20	8	
Total	1478	1576	1662	894	2531	3518	4356	2215	
1730-1800									
Location 6pm to 7pm	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM	
Reid Street to Villers Street NB	41	54	66	42	236	366	430	194	
Villers Street to Reid Street SB	68	75	81	47	362	396	594	300	
Bent Street NB	296	308	346	273	188	186	200	144	
Bent Street SB	417	432	482	310	326	328	446	240	
Bligh Street to Villers Street NB	61	57	63	66	200	202	218	158	
Villers Street to Bligh Street SB	110	124	132	70	350	352	470	240	
Spring St to Bent St via Gwydir WB	73	80	91	95	40	182	244	32	
Bent St to Pacific Hwy via Gwydir EB	116	122	141	116	21	27	78	26	
Spring St to Villers St via Gwydir NB	32	36	38	32	236	400	476	188	
Villers St to Spring via Gwydir SB	27	25	29	16	350	376	536	240	
Wharf Street to Bent Street EB	50	72	84	117	21	21	24	34	
Bent Street to Wharf Street WB	128	143	127	94	20	20	20	4	
Total	1419	1529	1680	1278	2350	2856	3736	1800	
1800-1830									
Location 6pm to 7pm	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM	
Reid Street to Villers Street NB	22	24	34	88	246	254	364	194	
Villers Street to Reid Street SB	66	57	71	59	358	366	376	300	
Bent Street NB	285	285	325	467	190	188	190	144	
Bent Street SB	365	363	421	397	324	332	332	240	
Bligh Street to Villers Street NB	38	36	44	73	202	200	208	158	
Villers Street to Bligh Street SB	96	97	121	105	348	352	356	240	
Spring St to Bent St via Gwydir WB	35	44	60	42	31	30	112	32	
Bent St to Pacific Hwy via Gwydir EB	88	80	96	83	18	19	21	26	
Spring St to Villers St via Gwydir NB	28	27	36	42	230	234	342	188	
Villers St to Spring via Gwydir SB	23	26	30	27	342	358	366	240	
Wharf Street to Bent Street EB	82	93	110	88	22	22	22	34	
Bent Street to Wharf Street WB	162	152	150	111	20	20	20	4	
Total	1290	1285	1497	1582	2331	2375	2708	1800	
1830-1900									
Location 6pm to 7pm	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM	
Reid Street to Villers Street NB	16	19	18	18	222	222	230	220	
Villers Street to Reid Street SB	47	46	47	82	336	374	382	112	
Bent Street NB	236	244	260	300	182	182	186	96	
Bent Street SB	283	313	297	384	306	336	342	88	
Bligh Street to Villers Street NB	34	34	39	39	200	196	198	106	
Villers Street to Bligh Street SB	82	87	82	97	332	356	366	96	
Spring St to Bent St via Gwydir WB	24	34	46	79	26	29	30	100	
Bent St to Pacific Hwy via Gwydir EB	64	71	70	103	18	18	19	9	
Spring St to Villers St via Gwydir NB	20	22	30	42	220	220	222	200	
Villers St to Spring via Gwydir SB	16	19	18	35	330	358	370	108	
Wharf Street to Bent Street EB	109	133	150	100	21	21	22	30	
Bent Street to Wharf Street WB	156	154	149	169	20	20	20	4	
Total	1088	1176	1206	1448	2213	2333	2387	1169	

Existing + Additional bridge Capacity						
	Counts			Travel Time (seconds)		
	2013 PM	2018 PM	2028 PM	2013 PM	2018 PM	2028 PM
1600-1630						
Reid Street to Villers Street NB	54	60	63	312	372	322
Villers Street to Reid Street SB	49	53	42	242	292	528
Bent Street NB	304	316	353	170	168	170
Bent Street SB	462	457	384	174	182	312
Bligh Street to Villers Street NB	58	55	64	180	182	200
Villers Street to Bligh Street SB	105	104	89	200	204	312
Spring St to Bent St via Gwydir WB	76	85	107	158	168	202
Bent St to Pacific Hwy via Gwydir EB	90	97	84	31	42	157
Spring St to Villers St via Gwydir NB	27	30	44	356	360	388
Villers St to Spring via Gwydir SB	42	36	32	210	262	452
Wharf Street to Bent Street EB	51	52	55	10	11	12
Bent Street to Wharf Street WB	79	78	62	9	9	9
Total	1398	1425	1379	2053	2252	3063
1630-1700						
				2013 PM	2018 PM	2028 PM
Reid Street to Villers Street NB	55	49	61	326	410	652
Villers Street to Reid Street SB	64	65	57	220	320	1050
Bent Street NB	305	316	313	166	170	394
Bent Street SB	543	575	449	174	184	960
Bligh Street to Villers Street NB	60	66	66	180	182	436
Villers Street to Bligh Street SB	131	134	104	200	210	516
Spring St to Bent St via Gwydir WB	81	88	100	188	308	163
Bent St to Pacific Hwy via Gwydir EB	109	102	107	30	64	173
Spring St to Villers St via Gwydir NB	37	40	42	360	476	676
Villers St to Spring via Gwydir SB	50	53	43	210	284	1030
Wharf Street to Bent Street EB	67	68	76	11	11	20
Bent Street to Wharf Street WB	85	91	64	9	9	7
Total	1468	1534	1364	2074	2627	6077
1700-1730						
Location 6pm to 7pm	2013 PM	2018 PM	2028 PM	2013 PM	2018 PM	2028 PM
Reid Street to Villers Street NB	63	66	45	366	408	652
Villers Street to Reid Street SB	85	78	25	232	444	1050
Bent Street NB	326	337	336	170	170	394
Bent Street SB	529	505	0	180	286	960
Bligh Street to Villers Street NB	74	73	39	180	188	436
Villers Street to Bligh Street SB	140	132	71	202	318	516
Spring St to Bent St via Gwydir WB	87	97	95	182	280	163
Bent St to Pacific Hwy via Gwydir EB	145	141	52	28	76	173
Spring St to Villers St via Gwydir NB	37	40	28	388	462	676
Villers St to Spring via Gwydir SB	38	37	20	212	418	1030
Wharf Street to Bent Street EB	139	191	102	12	16	20
Bent Street to Wharf Street WB	137	130	54	9	9	7
Total	1798	1827	865	2161	3074	6077
1730-1800						
Location 6pm to 7pm	2013 PM	2018 PM	2028 PM	2013 PM	2018 PM	2028 PM
Reid Street to Villers Street NB	62	62	76	260	406	572
Villers Street to Reid Street SB	94	102	43	210	418	1300
Bent Street NB	311	325	201	166	168	872
Bent Street SB	539	610	237	176	276	1160
Bligh Street to Villers Street NB	57	65	35	182	184	974
Villers Street to Bligh Street SB	137	166	59	200	310	1200
Spring St to Bent St via Gwydir WB	71	82	118	87	286	126
Bent St to Pacific Hwy via Gwydir EB	143	150	71	22	81	180
Spring St to Villers St via Gwydir NB	30	36	29	276	434	1100
Villers St to Spring via Gwydir SB	37	40	17	198	382	1260
Wharf Street to Bent Street EB	70	88	62	10	11	116
Bent Street to Wharf Street WB	154	141	59	9	9	5
Total	1705	1868	1005	1795	2965	8865
1800-1830						
Location 6pm to 7pm	2013 PM	2018 PM	2028 PM	2013 PM	2018 PM	2028 PM
Reid Street to Villers Street NB	35	42	67	212	360	572
Villers Street to Reid Street SB	47	51	55	204	212	1300
Bent Street NB	291	313	402	162	170	872
Bent Street SB	303	316	268	170	170	1160
Bligh Street to Villers Street NB	33	39	49	178	180	974
Villers Street to Bligh Street SB	81	92	132	190	190	1200
Spring St to Bent St via Gwydir WB	47	63	44	29	68	126
Bent St to Pacific Hwy via Gwydir EB	65	71	81	19	22	180
Spring St to Villers St via Gwydir NB	27	34	30	206	262	1100
Villers St to Spring via Gwydir SB	19	27	18	192	194	1260
Wharf Street to Bent Street EB	93	118	53	9	10	116
Bent Street to Wharf Street WB	138	148	95	9	9	5
Total	1177	1314	1294	1580	1846	8865
1830-1900						
Location 6pm to 7pm	2013 PM	2018 PM	2028 PM	2013 PM	2018 PM	2028 PM
Reid Street to Villers Street NB	20	21	19	200	204	97
Villers Street to Reid Street SB	31	29	50	200	200	970
Bent Street NB	227	236	293	162	162	57
Bent Street SB	209	215	275	170	170	760
Bligh Street to Villers Street NB	29	34	38	176	178	63
Villers Street to Bligh Street SB	57	62	168	190	190	67
Spring St to Bent St via Gwydir WB	39	37	54	24	24	28
Bent St to Pacific Hwy via Gwydir EB	44	50	63	18	18	177
Spring St to Villers St via Gwydir NB	23	23	41	196	200	100
Villers St to Spring via Gwydir SB	13	14	31	190	192	967
Wharf Street to Bent Street EB	131	153	54	9	9	134
Bent Street to Wharf Street WB	117	111	98	9	9	6
Total	940	986	1183	1544	1555	3424

Option 1								
	Travel Time (seconds)				Counts			
	Existing AM	2013 AM	2018 AM	2028 AM	Existing AM	2013 AM	2018 AM	2028 AM
7 to 730								
Reid Street to Villers Street NB	212	212	210	210	62	61	57	51
Villers Street to Reid Street SB	200	200	200	206	36	28	29	32
Bent Street NB	178	180	180	180	228	221	232	211
Bent Street SB	170	170	170	170	172	152	149	164
Bligh Street to Villers Street NB	192	190	190	192	35	45	54	49
Villers Street to Bligh Street SB	192	190	190	190	25	23	20	22
Spring St to Bent St via Gwydir WB	22	22	22	22	54	53	58	79
Bent St to Pacific Hwy via Gwydir EB	19	18	19	19	51	41	45	53
Spring St to Villers St via Gwydir NB	204	206	206	210	24	16	16	19
Villers St to Spring via Gwydir SB	192	190	192	190	20	18	19	28
Wharf Street to Bent Street EB	20	20	20	20	76	87	85	82
Bent Street to Wharf Street WB	20	20	20	20	34	26	32	38
Total	1620	1618	1619	1630	817	770	795	827
730 to 8								
Location 5pm to 6pm								
Reid Street to Villers Street NB	232	224	220	228	74	73	76	75
Villers Street to Reid Street SB	212	206	210	216	45	43	44	52
Bent Street NB	196	186	186	190	362	362	363	374
Bent Street SB	176	170	176	172	242	225	243	251
Bligh Street to Villers Street NB	214	200	198	208	57	79	85	85
Villers Street to Bligh Street SB	196	198	190	198	38	34	35	38
Spring St to Bent St via Gwydir WB	24	24	23	26	97	103	92	139
Bent St to Pacific Hwy via Gwydir EB	21	20	22	27	70	64	70	84
Spring St to Villers St via Gwydir NB	226	218	216	220	44	40	26	38
Villers St to Spring via Gwydir SB	196	192	198	196	28	29	33	36
Wharf Street to Bent Street EB	23	21	21	21	89	81	85	90
Bent Street to Wharf Street WB	20	20	20	20	52	47	50	59
Total	1736	1679	1680	1722	1197	1180	1204	1319
8 to 830								
Location 6pm to 7pm								
Reid Street to Villers Street NB	296	388	358	408	92	70	71	74
Villers Street to Reid Street SB	212	212	222	228	50	58	65	70
Bent Street NB	254	348	316	358	446	449	447	454
Bent Street SB	176	178	180	180	270	268	297	293
Bligh Street to Villers Street NB	276	360	334	410	67	92	91	102
Villers Street to Bligh Street SB	196	200	200	200	48	47	47	48
Spring St to Bent St via Gwydir WB	27	26	29	28	162	166	167	170
Bent St to Pacific Hwy via Gwydir EB	23	25	29	39	72	76	91	106
Spring St to Villers St via Gwydir NB	294	390	374	398	89	75	74	75
Villers St to Spring via Gwydir SB	198	198	200	198	32	33	39	34
Wharf Street to Bent Street EB	33	144	68	219	124	111	139	130
Bent Street to Wharf Street WB	20	20	20	20	69	64	72	70
Total	2005	2490	2329	2686	1519	1508	1600	1624
830 to 9								
Location 6pm to 7pm								
Reid Street to Villers Street NB	556	634	610	608	73	78	80	72
Villers Street to Reid Street SB	216	214	218	230	59	58	70	77
Bent Street NB	502	564	550	544	443	463	459	466
Bent Street SB	180	180	180	180	291	303	333	322
Bligh Street to Villers Street NB	572	774	754	758	71	79	79	78
Villers Street to Bligh Street SB	200	200	200	200	51	59	58	56
Spring St to Bent St via Gwydir WB	27	32	30	30	182	182	178	195
Bent St to Pacific Hwy via Gwydir EB	24	24	26	34	79	80	93	104
Spring St to Villers St via Gwydir NB	534	594	584	574	109	121	112	116
Villers St to Spring via Gwydir SB	198	200	200	200	38	33	39	39
Wharf Street to Bent Street EB	326	726	676	710	92	89	98	110
Bent Street to Wharf Street WB	20	20	20	20	72	68	71	81
Total	3355	4162	4047	4088	1563	1613	1670	1717
9 to 930								
Location 6pm to 7pm								
Reid Street to Villers Street NB	588	618	594	588	81	75	78	79
Villers Street to Reid Street SB	210	210	210	214	50	58	64	62
Bent Street NB	522	546	534	538	501	514	510	505
Bent Street SB	170	172	170	170	241	263	264	253
Bligh Street to Villers Street NB	680	820	792	810	97	86	80	76
Villers Street to Bligh Street SB	194	196	198	196	50	42	48	47
Spring St to Bent St via Gwydir WB	24	25	24	24	87	97	96	119
Bent St to Pacific Hwy via Gwydir EB	19	21	23	25	67	81	90	91
Spring St to Villers St via Gwydir NB	550	568	552	564	62	62	55	66
Villers St to Spring via Gwydir SB	194	196	196	198	20	29	28	29
Wharf Street to Bent Street EB	430	896	850	792	70	81	79	102
Bent Street to Wharf Street WB	20	20	20	20	41	52	53	61
Total	3601	4288	4163	4139	1367	1439	1445	1489
930 to 10								
Location 6pm to 7pm								
Reid Street to Villers Street NB	370	618	608	586	81	82	72	80
Villers Street to Reid Street SB	210	210	210	218	58	64	55	63
Bent Street NB	332	556	550	534	479	513	513	519
Bent Street SB	170	174	174	178	249	265	250	256
Bligh Street to Villers Street NB	372	790	756	656	76	85	102	136
Villers Street to Bligh Street SB	194	200	198	198	49	51	51	47
Spring St to Bent St via Gwydir WB	24	25	25	25	90	102	110	122
Bent St to Pacific Hwy via Gwydir EB	20	21	22	29	77	97	91	117
Spring St to Villers St via Gwydir NB	362	570	562	544	49	46	49	43
Villers St to Spring via Gwydir SB	192	196	200	198	20	22	26	28
Wharf Street to Bent Street EB	31	1000	942	826	86	71	82	97
Bent Street to Wharf Street WB	20	20	20	20	44	48	53	48
Total	2297	4380	4267	4011	1357	1445	1454	1556

Option 1 + Additional bridge Capacity						
	Travel Time (seconds)			Counts		
	2013 AM	2018 AM	2028 AM	2013 AM	2018 AM	2028 AM
7 to 730						
Reid Street to Villers Street NB	200	194	196	57	54	56
Villers Street to Reid Street SB	200	200	200	29	32	33
Bent Street NB	160	160	160	218	213	230
Bent Street SB	170	170	170	146	160	169
Bligh Street to Villers Street NB	174	176	172	44	51	55
Villers Street to Bligh Street SB	190	190	190	21	21	29
Spring St to Bent St via Gwydir WB	22	22	22	55	59	68
Bent St to Pacific Hwy via Gwydir EB	18	19	20	47	51	49
Spring St to Villers St via Gwydir NB	190	190	190	18	16	14
Villers St to Spring via Gwydir SB	190	190	190	16	21	27
Wharf Street to Bent Street EB	20	20	20	79	83	84
Bent Street to Wharf Street WB	20	20	20	28	31	38
Total	1554	1550	1550	756	793	854
730 to 8						
Location 5pm to 6pm						
Reid Street to Villers Street NB	200	200	200	71	77	69
Villers Street to Reid Street SB	200	208	210	39	52	60
Bent Street NB	162	166	166	372	396	367
Bent Street SB	170	170	170	230	254	273
Bligh Street to Villers Street NB	180	184	180	85	92	90
Villers Street to Bligh Street SB	190	190	192	33	35	44
Spring St to Bent St via Gwydir WB	24	23	24	101	105	129
Bent St to Pacific Hwy via Gwydir EB	21	23	26	67	75	88
Spring St to Villers St via Gwydir NB	196	198	198	35	30	32
Villers St to Spring via Gwydir SB	190	190	190	30	39	42
Wharf Street to Bent Street EB	22	22	21	75	80	80
Bent Street to Wharf Street WB	20	20	20	49	57	55
Total	1574	1594	1597	1188	1291	1329
8 to 830						
Location 6pm to 7pm						
Reid Street to Villers Street NB	210	210	210	92	91	87
Villers Street to Reid Street SB	210	212	226	55	59	69
Bent Street NB	170	170	172	544	562	544
Bent Street SB	170	170	170	268	281	297
Bligh Street to Villers Street NB	192	204	214	102	114	117
Villers Street to Bligh Street SB	190	190	190	42	48	51
Spring St to Bent St via Gwydir WB	26	27	27	165	178	178
Bent St to Pacific Hwy via Gwydir EB	24	28	45	84	90	106
Spring St to Villers St via Gwydir NB	210	208	208	92	98	96
Villers St to Spring via Gwydir SB	190	190	190	31	41	33
Wharf Street to Bent Street EB	36	42	52	184	197	209
Bent Street to Wharf Street WB	20	20	20	76	74	79
Total	1648	1671	1724	1736	1833	1865
830 to 9						
Location 6pm to 7pm						
Reid Street to Villers Street NB	210	216	218	83	85	86
Villers Street to Reid Street SB	210	212	242	69	71	84
Bent Street NB	172	174	178	571	581	584
Bent Street SB	170	170	170	306	314	344
Bligh Street to Villers Street NB	196	220	254	126	129	126
Villers Street to Bligh Street SB	190	190	190	56	53	56
Spring St to Bent St via Gwydir WB	27	28	29	178	182	193
Bent St to Pacific Hwy via Gwydir EB	26	29	57	98	108	124
Spring St to Villers St via Gwydir NB	210	210	214	119	117	123
Villers St to Spring via Gwydir SB	190	190	194	39	41	40
Wharf Street to Bent Street EB	36	76	238	173	197	188
Bent Street to Wharf Street WB	20	20	20	82	97	90
Total	1657	1734	2004	1900	1977	2038
9 to 930						
Location 6pm to 7pm						
Reid Street to Villers Street NB	202	202	204	74	79	77
Villers Street to Reid Street SB	204	202	210	56	56	68
Bent Street NB	170	170	170	475	491	492
Bent Street SB	170	170	170	259	261	271
Bligh Street to Villers Street NB	180	186	214	73	87	92
Villers Street to Bligh Street SB	190	190	190	44	50	51
Spring St to Bent St via Gwydir WB	24	24	24	88	99	107
Bent St to Pacific Hwy via Gwydir EB	21	21	26	83	85	118
Spring St to Villers St via Gwydir NB	200	200	200	52	50	48
Villers St to Spring via Gwydir SB	190	190	190	25	24	28
Wharf Street to Bent Street EB	22	23	105	82	83	149
Bent Street to Wharf Street WB	20	20	20	41	47	53
Total	1593	1599	1724	1353	1414	1555
930 to 10						
Location 6pm to 7pm						
Reid Street to Villers Street NB	200	200	200	63	70	68
Villers Street to Reid Street SB	202	208	210	61	63	57
Bent Street NB	164	166	168	397	411	400
Bent Street SB	170	170	170	241	257	261
Bligh Street to Villers Street NB	180	180	184	62	69	68
Villers Street to Bligh Street SB	190	190	190	46	47	52
Spring St to Bent St via Gwydir WB	23	24	25	105	113	124
Bent St to Pacific Hwy via Gwydir EB	21	22	26	86	100	99
Spring St to Villers St via Gwydir NB	198	198	198	43	44	39
Villers St to Spring via Gwydir SB	190	192	190	20	24	28
Wharf Street to Bent Street EB	21	22	22	130	140	150
Bent Street to Wharf Street WB	20	20	20	49	47	54
Total	1579	1592	1603	1303	1385	1400

Option 1								
	Counts				Travel Time (seconds)			
	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM
1600-1630								
Reid Street to Villers Street NB	45	43	45	41	232	252	272	392
Villers Street to Reid Street SB	45	42	47	41	298	296	326	350
Bent Street NB	283	305	330	333	190	194	212	248
Bent Street SB	399	403	401	393	266	256	282	300
Bligh Street to Villers Street NB	65	63	70	61	206	212	236	292
Villers Street to Bligh Street SB	93	103	90	84	290	278	304	324
Spring St to Bent St via Gwydir WB	57	82	107	141	29	33	42	117
Bent St to Pacific Hwy via Gwydir EB	83	82	90	83	21	23	26	42
Spring St to Villers St via Gwydir NB	20	32	41	52	232	238	262	344
Villers St to Spring via Gwydir SB	35	34	36	37	280	288	302	322
Wharf Street to Bent Street EB	52	52	61	50	22	23	24	28
Bent Street to Wharf Street WB	67	65	63	60	20	20	20	20
Total	1243	1306	1382	1375	2085	2113	2308	2779
1630-1700								
Reid Street to Villers Street NB	42	38	40	52	234	238	270	704
Villers Street to Reid Street SB	63	52	56	53	350	362	372	412
Bent Street NB	283	296	321	374	188	190	204	324
Bent Street SB	440	441	438	449	316	320	328	342
Bligh Street to Villers Street NB	72	69	75	79	200	204	224	366
Villers Street to Bligh Street SB	110	111	99	100	340	344	350	372
Spring St to Bent St via Gwydir WB	54	83	100	134	28	34	42	258
Bent St to Pacific Hwy via Gwydir EB	103	97	109	107	20	22	23	51
Spring St to Villers St via Gwydir NB	20	35	44	59	228	234	260	574
Villers St to Spring via Gwydir SB	37	37	33	43	344	342	350	370
Wharf Street to Bent Street EB	63	67	70	67	22	22	23	154
Bent Street to Wharf Street WB	84	69	74	74	20	20	20	20
Total	1266	1304	1363	1486	2290	2332	2465	3948
1700-1730								
Location 6pm to 7pm	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM
Reid Street to Villers Street NB	38	43	58	50	236	250	278	704
Villers Street to Reid Street SB	63	61	58	41	366	372	368	412
Bent Street NB	292	324	352	348	190	200	214	324
Bent Street SB	415	426	446	420	328	330	326	342
Bligh Street to Villers Street NB	82	79	85	87	206	220	232	366
Villers Street to Bligh Street SB	104	111	111	103	348	354	350	372
Spring St to Bent St via Gwydir WB	77	87	103	132	29	35	47	258
Bent St to Pacific Hwy via Gwydir EB	119	122	124	85	20	21	23	51
Spring St to Villers St via Gwydir NB	31	37	44	42	228	248	262	574
Villers St to Spring via Gwydir SB	33	30	33	32	354	352	344	370
Wharf Street to Bent Street EB	93	141	169	177	23	25	28	154
Bent Street to Wharf Street WB	113	108	102	97	20	20	20	20
Total	1461	1569	1684	1613	2349	2427	2492	3948
1730-1800								
Location 6pm to 7pm	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM
Reid Street to Villers Street NB	38	48	64	88	230	234	236	612
Villers Street to Reid Street SB	73	75	70	86	358	362	360	746
Bent Street NB	291	317	339	394	186	190	190	342
Bent Street SB	406	440	444	451	326	320	322	468
Bligh Street to Villers Street NB	60	62	65	67	202	208	208	424
Villers Street to Bligh Street SB	104	113	128	123	350	342	342	500
Spring St to Bent St via Gwydir WB	73	76	75	122	26	30	32	240
Bent St to Pacific Hwy via Gwydir EB	115	121	117	152	19	21	21	262
Spring St to Villers St via Gwydir NB	30	32	35	62	226	226	232	594
Villers St to Spring via Gwydir SB	23	30	30	34	350	344	342	588
Wharf Street to Bent Street EB	47	58	93	126	21	22	23	180
Bent Street to Wharf Street WB	120	135	126	124	20	20	20	20
Total	1380	1508	1586	1829	2314	2319	2328	4976
1800-1830								
Location 6pm to 7pm	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM
Reid Street to Villers Street NB	19	21	24	45	228	230	230	612
Villers Street to Reid Street SB	67	60	70	83	358	366	354	746
Bent Street NB	285	286	307	393	188	188	190	342
Bent Street SB	376	380	397	441	330	332	326	468
Bligh Street to Villers Street NB	42	36	42	48	200	200	206	424
Villers Street to Bligh Street SB	106	101	107	123	350	354	350	500
Spring St to Bent St via Gwydir WB	29	44	57	65	27	26	27	240
Bent St to Pacific Hwy via Gwydir EB	92	83	91	119	19	19	20	262
Spring St to Villers St via Gwydir NB	25	31	34	51	222	222	230	594
Villers St to Spring via Gwydir SB	22	25	32	34	354	362	350	588
Wharf Street to Bent Street EB	79	92	112	87	22	22	23	180
Bent Street to Wharf Street WB	158	153	148	144	20	20	20	20
Total	1299	1311	1421	1632	2318	2341	2326	4976
1830-1900								
Location 6pm to 7pm	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM
Reid Street to Villers Street NB	14	14	15	18	220	224	218	226
Villers Street to Reid Street SB	44	48	44	65	338	372	380	364
Bent Street NB	237	246	253	292	182	182	184	190
Bent Street SB	287	295	287	360	308	340	348	330
Bligh Street to Villers Street NB	37	38	41	39	194	196	200	202
Villers Street to Bligh Street SB	80	80	84	107	310	362	370	354
Spring St to Bent St via Gwydir WB	24	38	43	32	24	25	25	27
Bent St to Pacific Hwy via Gwydir EB	65	73	74	89	18	18	19	19
Spring St to Villers St via Gwydir NB	18	26	28	24	218	216	220	224
Villers St to Spring via Gwydir SB	21	22	19	26	328	366	366	342
Wharf Street to Bent Street EB	109	124	158	121	21	21	22	22
Bent Street to Wharf Street WB	148	151	152	152	20	20	20	20
Total	1084	1155	1199	1324	2181	2343	2372	2320

Option 1 + Additional bridge Capacity							
	Counts			Travel Time (seconds)			
	2013 PM	2018 PM	2028 PM	2013 PM	2018 PM	2028 PM	
1600-1630							
Reid Street to Villers Street NB	41	49	45	212	226	276	
Villers Street to Reid Street SB	50	54	53	210	214	236	
Bent Street NB	307	334	327	168	170	170	
Bent Street SB	466	467	483	172	180	180	
Bligh Street to Villers Street NB	69	67	61	180	182	186	
Villers Street to Bligh Street SB	111	107	106	198	200	200	
Spring St to Bent St via Gwydir WB	86	105	128	32	43	110	
Bent St to Pacific Hwy via Gwydir EB	90	91	94	24	25	39	
Spring St to Villers St via Gwydir NB	38	40	52	206	222	284	
Villers St to Spring via Gwydir SB	37	41	41	196	200	200	
Wharf Street to Bent Street EB	50	58	56	23	24	25	
Bent Street to Wharf Street WB	75	75	81	20	20	20	
Total	1419	1488	1527	1641	1706	1926	
1630-1700							
Reid Street to Villers Street NB	38	37	46	212	220	368	
Villers Street to Reid Street SB	63	69	75	210	218	260	
Bent Street NB	300	311	359	168	170	170	
Bent Street SB	528	560	560	178	180	190	
Bligh Street to Villers Street NB	72	73	68	180	186	206	
Villers Street to Bligh Street SB	125	138	119	200	202	214	
Spring St to Bent St via Gwydir WB	78	97	137	36	52	191	
Bent St to Pacific Hwy via Gwydir EB	103	111	125	22	26	47	
Spring St to Villers St via Gwydir NB	35	44	60	212	218	356	
Villers St to Spring via Gwydir SB	46	42	44	196	200	212	
Wharf Street to Bent Street EB	65	75	77	23	23	49	
Bent Street to Wharf Street WB	84	82	83	20	20	20	
Total	1437	1532	1632	1657	1715	2284	
1700-1730							
Location 6pm to 7pm							
Reid Street to Villers Street NB	45	51	72	216	230	368	
Villers Street to Reid Street SB	82	80	70	212	218	260	
Bent Street NB	328	336	391	170	170	170	
Bent Street SB	530	543	479	180	180	190	
Bligh Street to Villers Street NB	85	81	81	184	184	206	
Villers Street to Bligh Street SB	142	150	125	200	200	214	
Spring St to Bent St via Gwydir WB	87	94	128	37	48	191	
Bent St to Pacific Hwy via Gwydir EB	139	135	134	22	25	47	
Spring St to Villers St via Gwydir NB	37	40	54	214	226	356	
Villers St to Spring via Gwydir SB	36	37	30	200	200	212	
Wharf Street to Bent Street EB	137	179	211	24	28	49	
Bent Street to Wharf Street WB	138	127	127	20	20	20	
Total	1785	1852	1901	1679	1730	2284	
1730-1800							
Location 6pm to 7pm							
Reid Street to Villers Street NB	44	52	87	210	220	380	
Villers Street to Reid Street SB	84	98	95	210	212	308	
Bent Street NB	306	324	391	170	170	170	
Bent Street SB	527	559	536	172	180	186	
Bligh Street to Villers Street NB	65	66	75	180	182	232	
Villers Street to Bligh Street SB	142	155	145	200	200	210	
Spring St to Bent St via Gwydir WB	74	90	124	29	41	214	
Bent St to Pacific Hwy via Gwydir EB	127	143	153	21	23	93	
Spring St to Villers St via Gwydir NB	32	36	54	210	220	386	
Villers St to Spring via Gwydir SB	29	31	34	200	200	222	
Wharf Street to Bent Street EB	58	84	100	22	24	24	
Bent Street to Wharf Street WB	140	148	144	20	20	20	
Total	1627	1787	1939	1644	1692	2445	
1800-1830							
Location 6pm to 7pm							
Reid Street to Villers Street NB	24	22	40	208	210	380	
Villers Street to Reid Street SB	44	51	82	200	206	308	
Bent Street NB	290	292	368	170	168	170	
Bent Street SB	294	323	454	170	170	186	
Bligh Street to Villers Street NB	41	39	46	180	180	232	
Villers Street to Bligh Street SB	78	94	133	190	190	210	
Spring St to Bent St via Gwydir WB	51	54	54	23	25	214	
Bent St to Pacific Hwy via Gwydir EB	61	70	111	19	20	93	
Spring St to Villers St via Gwydir NB	32	32	36	200	200	386	
Villers St to Spring via Gwydir SB	19	21	32	192	190	222	
Wharf Street to Bent Street EB	92	113	89	22	22	24	
Bent Street to Wharf Street WB	143	152	167	20	20	20	
Total	1169	1263	1611	1594	1602	2445	
1830-1900							
Location 6pm to 7pm							
Reid Street to Villers Street NB	15	21	21	202	202	206	
Villers Street to Reid Street SB	33	33	43	200	200	204	
Bent Street NB	238	259	289	164	164	168	
Bent Street SB	206	213	258	170	170	172	
Bligh Street to Villers Street NB	36	42	37	180	178	180	
Villers Street to Bligh Street SB	56	56	84	190	190	192	
Spring St to Bent St via Gwydir WB	37	40	35	23	23	25	
Bent St to Pacific Hwy via Gwydir EB	50	52	63	18	19	20	
Spring St to Villers St via Gwydir NB	26	26	26	196	198	200	
Villers St to Spring via Gwydir SB	14	16	16	190	190	192	
Wharf Street to Bent Street EB	117	148	116	21	21	22	
Bent Street to Wharf Street WB	112	110	121	20	20	20	
Total	940	1016	1109	1574	1575	1601	

Option 2		Travel Time (seconds)				Counts			
	Existing AM	2013 AM	2018 AM	2028 AM	Existing AM	2013 AM	2018 AM	2028 AM	
7 to 730									
Reid Street to Villers Street NB	210	210	210	212	52	51	60	56	
Villers Street to Reid Street SB	200	204	202	208	23	26	34	36	
Bent Street NB	180	178	180	180	190	216	228	222	
Bent Street SB	170	170	170	170	153	171	180	193	
Bligh Street to Villers Street NB	190	190	190	192	31	49	49	49	
Villers Street to Bligh Street SB	190	190	190	192	21	25	21	25	
Spring St to Bent St via Gwydir WB	21	22	22	22	75	106	121	159	
Bent St to Pacific Hwy via Gwydir EB	18	19	20	22	51	64	77	89	
Spring St to Villers St via Gwydir NB	206	210	208	210	14	18	15	19	
Villers St to Spring via Gwydir SB	186	190	190	190	32	39	45	57	
Wharf Street to Bent Street EB	20	20	20	20	84	80	85	85	
Bent Street to Wharf Street WB	20	20	20	20	26	25	37	37	
Total	1611	1622	1622	1638	754	870	953	1027	
730 to 8									
Location 5pm to 6pm									
Reid Street to Villers Street NB	218	224	224	224	70	67	74	69	
Villers Street to Reid Street SB	210	212	214	232	39	42	46	51	
Bent Street NB	182	186	188	188	336	358	372	357	
Bent Street SB	170	170	172	180	248	267	279	311	
Bligh Street to Villers Street NB	200	206	200	210	53	80	82	84	
Villers Street to Bligh Street SB	196	200	198	200	37	33	33	34	
Spring St to Bent St via Gwydir WB	24	26	26	30	157	195	228	273	
Bent St to Pacific Hwy via Gwydir EB	20	23	30	46	89	106	120	141	
Spring St to Villers St via Gwydir NB	212	216	220	224	38	33	37	34	
Villers St to Spring via Gwydir SB	190	190	190	192	51	61	71	88	
Wharf Street to Bent Street EB	21	21	21	21	77	74	76	80	
Bent Street to Wharf Street WB	20	20	20	20	44	48	50	55	
Total	1662	1694	1703	1766	1239	1363	1469	1577	
8 to 830									
Location 6pm to 7pm									
Reid Street to Villers Street NB	312	372	376	372	78	71	67	82	
Villers Street to Reid Street SB	216	224	230	558	52	62	58	55	
Bent Street NB	286	346	340	336	432	444	431	467	
Bent Street SB	180	178	180	322	306	316	331	253	
Bligh Street to Villers Street NB	312	362	348	386	65	97	86	100	
Villers Street to Bligh Street SB	198	198	200	284	46	46	55	43	
Spring St to Bent St via Gwydir WB	29	30	32	36	245	263	273	306	
Bent St to Pacific Hwy via Gwydir EB	26	38	43	278	102	130	132	129	
Spring St to Villers St via Gwydir NB	336	416	390	390	90	76	71	88	
Villers St to Spring via Gwydir SB	190	190	190	448	74	75	75	57	
Wharf Street to Bent Street EB	55	142	108	169	112	118	132	139	
Bent Street to Wharf Street WB	20	20	20	20	69	69	78	69	
Total	2161	2516	2457	3599	1672	1767	1788	1788	
830 to 9									
Location 6pm to 7pm									
Reid Street to Villers Street NB	568	616	614	572	69	66	71	54	
Villers Street to Reid Street SB	220	224	250	1238	54	61	79	22	
Bent Street NB	518	548	552	458	446	462	455	312	
Bent Street SB	180	180	180	1148	331	336	356	88	
Bligh Street to Villers Street NB	604	706	716	688	78	95	79	56	
Villers Street to Bligh Street SB	200	200	200	1066	51	53	51	15	
Spring St to Bent St via Gwydir WB	31	32	34	142	265	289	310	193	
Bent St to Pacific Hwy via Gwydir EB	29	31	55	562	105	125	163	78	
Spring St to Villers St via Gwydir NB	548	580	586	594	110	114	117	73	
Villers St to Spring via Gwydir SB	190	190	198	1278	77	77	84	16	
Wharf Street to Bent Street EB	422	728	680	762	97	86	101	81	
Bent Street to Wharf Street WB	20	20	20	20	66	69	79	32	
Total	3530	4055	4085	8528	1750	1832	1945	1020	
9 to 930									
Location 6pm to 7pm									
Reid Street to Villers Street NB	600	594	584	682	74	82	80	12	
Villers Street to Reid Street SB	208	210	224	1380	55	53	56	3	
Bent Street NB	542	536	532	574	497	517	512	67	
Bent Street SB	170	172	172	1260	272	271	273	5	
Bligh Street to Villers Street NB	662	776	772	940	85	88	83	10	
Villers Street to Bligh Street SB	194	196	198	400	47	48	41	2	
Spring St to Bent St via Gwydir WB	25	27	28	408	174	187	208	20	
Bent St to Pacific Hwy via Gwydir EB	23	27	36	748	115	130	132	13	
Spring St to Villers St via Gwydir NB	568	568	566	760	61	58	59	20	
Villers St to Spring via Gwydir SB	190	190	190	480	45	46	49	1	
Wharf Street to Bent Street EB	614	900	844	392	77	85	85	20	
Bent Street to Wharf Street WB	20	20	20	16	42	47	54	6	
Total	3816	4216	4166	8040	1545	1611	1631	180	
930 to 10									
Location 6pm to 7pm									
Reid Street to Villers Street NB	442	592	590	0	76	79	72	#DIV/0!	
Villers Street to Reid Street SB	212	212	216	0	56	61	59	#DIV/0!	
Bent Street NB	396	538	528	0	478	510	515	#DIV/0!	
Bent Street SB	170	174	178	0	269	290	275	#DIV/0!	
Bligh Street to Villers Street NB	440	700	670	0	82	102	111	#DIV/0!	
Villers Street to Bligh Street SB	192	196	200	0	48	51	47	#DIV/0!	
Spring St to Bent St via Gwydir WB	25	26	27	0	181	212	226	#DIV/0!	
Bent St to Pacific Hwy via Gwydir EB	22	27	30	0	117	135	162	#DIV/0!	
Spring St to Villers St via Gwydir NB	416	558	558	0	53	50	44	#DIV/0!	
Villers St to Spring via Gwydir SB	190	190	190	0	42	47	53	#DIV/0!	
Wharf Street to Bent Street EB	76	822	938	0	96	95	76	#DIV/0!	
Bent Street to Wharf Street WB	20	20	20	0	44	41	50	#DIV/0!	
Total	2602	4055	4145	0	1542	1672	1689	#DIV/0!	

Option 2 + Additional bridge Capacity						
	Travel Time (seconds)			Counts		
	2013 AM	2018 AM	2028 AM	2013 AM	2018 AM	2028 AM
7 to 730						
Reid Street to Villers Street NB	200	200	200	57	58	49
Villers Street to Reid Street SB	200	200	200	25	30	30
Bent Street NB	164	160	164	214	217	226
Bent Street SB	170	170	170	173	182	190
Bligh Street to Villers Street NB	180	178	180	47	47	51
Villers Street to Bligh Street SB	190	190	190	25	19	26
Spring St to Bent St via Gwydir WB	22	22	23	97	127	149
Bent St to Pacific Hwy via Gwydir EB	19	20	21	61	80	85
Spring St to Villers St via Gwydir NB	190	194	196	13	16	21
Villers St to Spring via Gwydir SB	180	182	186	41	44	54
Wharf Street to Bent Street EB	20	20	20	79	84	78
Bent Street to Wharf Street WB	20	20	20	30	32	33
Total	1555	1556	1570	860	936	991
730 to 8						
Location 5pm to 6pm	2013 AM	2018 AM	2028 AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	200	206	204	75	71	75
Villers Street to Reid Street SB	208	212	238	48	49	48
Bent Street NB	170	170	170	373	367	372
Bent Street SB	170	170	170	271	289	303
Bligh Street to Villers Street NB	180	184	188	82	85	84
Villers Street to Bligh Street SB	190	190	196	34	37	37
Spring St to Bent St via Gwydir WB	25	27	29	199	214	279
Bent St to Pacific Hwy via Gwydir EB	26	32	48	118	122	133
Spring St to Villers St via Gwydir NB	200	202	204	32	32	31
Villers St to Spring via Gwydir SB	186	186	190	67	74	78
Wharf Street to Bent Street EB	21	22	21	79	83	81
Bent Street to Wharf Street WB	20	20	20	44	54	56
Total	1596	1620	1678	1423	1478	1577
8 to 830						
Location 6pm to 7pm	2013 AM	2018 AM	2028 AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	214	214	212	92	89	84
Villers Street to Reid Street SB	214	230	560	58	59	51
Bent Street NB	174	174	172	551	536	543
Bent Street SB	170	170	354	306	322	245
Bligh Street to Villers Street NB	202	198	262	115	105	114
Villers Street to Bligh Street SB	190	190	372	44	49	36
Spring St to Bent St via Gwydir WB	29	31	34	256	282	316
Bent St to Pacific Hwy via Gwydir EB	29	46	276	118	139	143
Spring St to Villers St via Gwydir NB	214	210	216	95	101	100
Villers St to Spring via Gwydir SB	186	190	456	61	76	66
Wharf Street to Bent Street EB	46	46	91	181	208	199
Bent Street to Wharf Street WB	20	20	20	72	76	60
Total	1688	1718	3025	1950	2044	1958
830 to 9						
Location 6pm to 7pm	2013 AM	2018 AM	2028 AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	218	220	214	85	77	50
Villers Street to Reid Street SB	216	248	848	61	70	31
Bent Street NB	180	180	174	589	575	343
Bent Street SB	170	170	764	345	361	96
Bligh Street to Villers Street NB	204	216	362	123	123	53
Villers Street to Bligh Street SB	190	192	852	53	56	14
Spring St to Bent St via Gwydir WB	31	33	99	281	299	175
Bent St to Pacific Hwy via Gwydir EB	35	61	492	127	153	80
Spring St to Villers St via Gwydir NB	220	218	236	114	120	66
Villers St to Spring via Gwydir SB	190	192	612	77	77	27
Wharf Street to Bent Street EB	36	43	348	166	184	109
Bent Street to Wharf Street WB	20	20	20	72	87	32
Total	1711	1794	5022	2093	2182	1075
9 to 930						
Location 6pm to 7pm	2013 AM	2018 AM	2028 AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	204	206	42	76	77	26
Villers Street to Reid Street SB	208	208	360	62	61	2
Bent Street NB	170	170	170	476	495	273
Bent Street SB	170	170	NA	281	280	33
Bligh Street to Villers Street NB	186	196	62	79	87	52
Villers Street to Bligh Street SB	190	190	260	42	46	8
Spring St to Bent St via Gwydir WB	26	25	73	184	208	27
Bent St to Pacific Hwy via Gwydir EB	25	28	74	130	141	37
Spring St to Villers St via Gwydir NB	204	202	42	48	50	16
Villers St to Spring via Gwydir SB	180	188	320	53	54	2
Wharf Street to Bent Street EB	23	23	80	82	90	51
Bent Street to Wharf Street WB	20	20	12	43	51	8
Total	1606	1627	1495	1557	1641	535
930 to 10						
Location 6pm to 7pm	2013 AM	2018 AM	2028 AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	200	204	0	64	77	#DIV/0!
Villers Street to Reid Street SB	208	214	0	56	59	#DIV/0!
Bent Street NB	170	170	0	407	418	#DIV/0!
Bent Street SB	170	170	0	277	273	#DIV/0!
Bligh Street to Villers Street NB	184	182	0	72	73	#DIV/0!
Villers Street to Bligh Street SB	190	190	0	45	46	#DIV/0!
Spring St to Bent St via Gwydir WB	25	27	0	196	219	#DIV/0!
Bent St to Pacific Hwy via Gwydir EB	28	31	0	125	148	#DIV/0!
Spring St to Villers St via Gwydir NB	200	204	0	44	41	#DIV/0!
Villers St to Spring via Gwydir SB	184	184	0	50	52	#DIV/0!
Wharf Street to Bent Street EB	22	22	0	138	148	#DIV/0!
Bent Street to Wharf Street WB	20	20	0	40	47	#DIV/0!
Total	1600	1618	0	1515	1601	#DIV/0!

Option 2								
	Counts				Travel Time (seconds)			
	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM
1600-1630								
Reid Street to Villers Street NB	42	42	43	42	232	246	312	362
Villers Street to Reid Street SB	45	48	36	23	302	314	452	606
Bent Street NB	280	303	312	300	188	194	208	220
Bent Street SB	441	448	421	295	270	276	274	290
Bligh Street to Villers Street NB	68	66	61	58	204	212	228	274
Villers Street to Bligh Street SB	101	101	87	60	292	298	302	312
Spring St to Bent St via Gwydir WB	126	160	199	225	35	53	113	155
Bent St to Pacific Hwy via Gwydir EB	111	114	115	88	22	25	125	240
Spring St to Villers St via Gwydir NB	20	34	38	41	232	262	350	396
Villers St to Spring via Gwydir SB	83	73	69	44	282	288	310	484
Wharf Street to Bent Street EB	47	58	55	65	23	22	23	26
Bent Street to Wharf Street WB	73	69	73	51	20	20	20	20
Total	1437	1517	1507	1291	2102	2210	2717	3384
1630-1700								
Reid Street to Villers Street NB	41	44	42	33	228	262	338	0
Villers Street to Reid Street SB	55	55	50	15	356	362	450	260
Bent Street NB	276	304	324	239	188	190	204	36
Bent Street SB	486	499	492	276	322	326	358	220
Bligh Street to Villers Street NB	66	73	74	47	200	208	222	42
Villers Street to Bligh Street SB	104	115	105	28	344	348	384	240
Spring St to Bent St via Gwydir WB	112	166	181	86	31	60	185	101
Bent St to Pacific Hwy via Gwydir EB	112	133	132	48	21	25	75	148
Spring St to Villers St via Gwydir NB	21	35	39	29	228	266	388	104
Villers St to Spring via Gwydir SB	84	88	90	24	334	340	416	280
Wharf Street to Bent Street EB	64	68	66	56	22	23	23	16
Bent Street to Wharf Street WB	76	72	73	22	20	20	20	0
Total	1400	1555	1576	854	2294	2429	3064	1448
1700-1730								
Location 6pm to 7pm	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM
Reid Street to Villers Street NB	37	45	49	#DIV/0!	240	268	350	0
Villers Street to Reid Street SB	63	64	42	4	374	378	660	260
Bent Street NB	294	321	332	0	192	206	202	36
Bent Street SB	450	476	460	0	330	332	596	220
Bligh Street to Villers Street NB	75	78	71	1	208	226	228	42
Villers Street to Bligh Street SB	110	111	88	5	354	356	618	240
Spring St to Bent St via Gwydir WB	154	185	201	7	37	62	200	101
Bent St to Pacific Hwy via Gwydir EB	152	161	135	13	22	25	177	148
Spring St to Villers St via Gwydir NB	33	35	35	1	246	272	446	104
Villers St to Spring via Gwydir SB	60	70	62	1	344	348	648	280
Wharf Street to Bent Street EB	111	137	170	19	23	25	30	16
Bent Street to Wharf Street WB	115	106	94	#DIV/0!	20	20	20	0
Total	1654	1789	1738	#DIV/0!	2390	2517	4174	1448
1730-1800								
Location 6pm to 7pm	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM
Reid Street to Villers Street NB	42	46	59	#DIV/0!	224	230	440	0
Villers Street to Reid Street SB	73	83	76	4	356	370	892	650
Bent Street NB	293	305	350	10	186	186	312	90
Bent Street SB	439	465	461	16	328	326	586	550
Bligh Street to Villers Street NB	65	62	68	1	202	200	350	105
Villers Street to Bligh Street SB	101	109	111	5	356	350	602	600
Spring St to Bent St via Gwydir WB	137	156	199	21	30	35	128	165
Bent St to Pacific Hwy via Gwydir EB	146	164	188	13	20	23	136	370
Spring St to Villers St via Gwydir NB	31	30	40	1	228	236	468	260
Villers St to Spring via Gwydir SB	55	54	61	1	346	340	824	700
Wharf Street to Bent Street EB	49	60	86	33	21	22	165	22
Bent Street to Wharf Street WB	133	126	116	#DIV/0!	20	20	20	0
Total	1564	1662	1813	#DIV/0!	2317	2338	4923	3512
1800-1830								
Location 6pm to 7pm	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM
Reid Street to Villers Street NB	20	22	29	#DIV/0!	224	228	450	0
Villers Street to Reid Street SB	57	60	72	#DIV/0!	360	366	522	650
Bent Street NB	281	300	319	#DIV/0!	186	192	250	90
Bent Street SB	388	397	436	#DIV/0!	330	332	454	550
Bligh Street to Villers Street NB	34	40	48	#DIV/0!	202	204	354	105
Villers Street to Bligh Street SB	90	105	108	#DIV/0!	352	352	482	600
Spring St to Bent St via Gwydir WB	115	150	190	#DIV/0!	27	31	70	165
Bent St to Pacific Hwy via Gwydir EB	121	135	163	#DIV/0!	19	21	50	370
Spring St to Villers St via Gwydir NB	25	32	35	#DIV/0!	222	234	376	260
Villers St to Spring via Gwydir SB	49	52	58	#DIV/0!	344	344	478	700
Wharf Street to Bent Street EB	88	88	124	#DIV/0!	21	23	94	22
Bent Street to Wharf Street WB	161	149	132	#DIV/0!	20	20	20	0
Total	1430	1529	1715	#DIV/0!	2308	2346	3601	3512
1830-1900								
Location 6pm to 7pm	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM
Reid Street to Villers Street NB	12	13	19	#DIV/0!	218	220	310	0
Villers Street to Reid Street SB	49	51	55	#DIV/0!	350	370	384	0
Bent Street NB	226	245	294	#DIV/0!	182	180	254	0
Bent Street SB	327	327	365	#DIV/0!	318	334	350	0
Bligh Street to Villers Street NB	31	37	47	#DIV/0!	196	196	286	0
Villers Street to Bligh Street SB	84	80	95	#DIV/0!	342	356	378	0
Spring St to Bent St via Gwydir WB	92	112	130	#DIV/0!	25	28	38	0
Bent St to Pacific Hwy via Gwydir EB	99	112	129	#DIV/0!	19	19	20	0
Spring St to Villers St via Gwydir NB	22	27	26	#DIV/0!	220	222	338	0
Villers St to Spring via Gwydir SB	44	44	45	#DIV/0!	330	348	366	0
Wharf Street to Bent Street EB	116	135	156	#DIV/0!	21	22	76	0
Bent Street to Wharf Street WB	154	163	158	#DIV/0!	20	20	20	0
Total	1255	1346	1519	#DIV/0!	2240	2315	2820	0

Option 2 + Additional bridge Capacity						
	Counts			Travel Time (seconds)		
	2013 PM	2018 PM	2028 PM	2013 PM	2018 PM	2028 PM
1600-1630						
Reid Street to Villers Street NB	42	43	53	246	294	308
Villers Street to Reid Street SB	55	39	28	218	270	460
Bent Street NB	314	317	313	170	170	170
Bent Street SB	501	461	335	180	184	212
Bligh Street to Villers Street NB	66	70	54	188	188	204
Villers Street to Bligh Street SB	102	96	68	200	208	236
Spring St to Bent St via Gwydir WB	165	196	243	74	135	113
Bent St to Pacific Hwy via Gwydir EB	125	109	74	26	71	210
Spring St to Villers St via Gwydir NB	31	37	44	254	322	318
Villers St to Spring via Gwydir SB	87	71	48	192	210	320
Wharf Street to Bent Street EB	50	56	62	23	23	24
Bent Street to Wharf Street WB	69	67	62	20	20	20
Total	1605	1561	1384	1791	2095	2595
1630-1700						
Reid Street to Villers Street NB	42	42	11	232	312	0
Villers Street to Reid Street SB	64	62	5	218	492	0
Bent Street NB	297	328	150	170	170	152
Bent Street SB	581	566	NA	180	302	480
Bligh Street to Villers Street NB	68	74	15	182	192	260
Villers Street to Bligh Street SB	126	120	10	200	328	480
Spring St to Bent St via Gwydir WB	170	181	28	54	170	13
Bent St to Pacific Hwy via Gwydir EB	131	139	23	28	98	0
Spring St to Villers St via Gwydir NB	38	43	8	236	378	0
Villers St to Spring via Gwydir SB	102	98	3	192	374	0
Wharf Street to Bent Street EB	67	71	58	22	24	54
Bent Street to Wharf Street WB	83	78	9	20	20	4
Total	1662	1699	303	1734	2860	1443
1700-1730						
Location 6pm to 7pm						
Reid Street to Villers Street NB	42	54	#DIV/0!	242	232	0
Villers Street to Reid Street SB	79	76	#DIV/0!	250	366	0
Bent Street NB	320	339	0	170	136	152
Bent Street SB	562	568	0	196	292	480
Bligh Street to Villers Street NB	81	85	1	188	154	260
Villers Street to Bligh Street SB	135	131	5	222	310	480
Spring St to Bent St via Gwydir WB	200	200	1	76	106	13
Bent St to Pacific Hwy via Gwydir EB	192	181	#DIV/0!	35	72	0
Spring St to Villers St via Gwydir NB	35	43	#DIV/0!	260	268	0
Villers St to Spring via Gwydir SB	71	71	#DIV/0!	212	330	0
Wharf Street to Bent Street EB	130	153	27	26	32	54
Bent Street to Wharf Street WB	128	129	1	20	16	4
Total	1977	2029	#DIV/0!	1896	2314	1443
1730-1800						
Location 6pm to 7pm						
Reid Street to Villers Street NB	45	55	#DIV/0!	228	252	0
Villers Street to Reid Street SB	94	83	#DIV/0!	214	432	0
Bent Street NB	310	294	#DIV/0!	170	136	0
Bent Street SB	561	507	#DIV/0!	180	282	0
Bligh Street to Villers Street NB	63	51	#DIV/0!	186	154	0
Villers Street to Bligh Street SB	137	138	#DIV/0!	200	300	0
Spring St to Bent St via Gwydir WB	164	180	#DIV/0!	46	154	0
Bent St to Pacific Hwy via Gwydir EB	183	159	#DIV/0!	24	150	0
Spring St to Villers St via Gwydir NB	34	34	#DIV/0!	230	308	0
Villers St to Spring via Gwydir SB	64	62	#DIV/0!	192	342	0
Wharf Street to Bent Street EB	63	86	#DIV/0!	22	20	0
Bent Street to Wharf Street WB	136	127	#DIV/0!	20	16	0
Total	1854	1774	#DIV/0!	1712	2546	0
1800-1830						
Location 6pm to 7pm						
Reid Street to Villers Street NB	18	20	#DIV/0!	210	723	0
Villers Street to Reid Street SB	54	51	#DIV/0!	208	670	0
Bent Street NB	283	247	#DIV/0!	170	555	0
Bent Street SB	333	336	#DIV/0!	170	653	0
Bligh Street to Villers Street NB	41	32	#DIV/0!	180	518	0
Villers Street to Bligh Street SB	80	84	#DIV/0!	196	725	0
Spring St to Bent St via Gwydir WB	150	162	#DIV/0!	28	198	0
Bent St to Pacific Hwy via Gwydir EB	121	125	#DIV/0!	21	258	0
Spring St to Villers St via Gwydir NB	31	25	#DIV/0!	208	775	0
Villers St to Spring via Gwydir SB	44	44	#DIV/0!	190	713	0
Wharf Street to Bent Street EB	92	107	#DIV/0!	23	75	0
Bent Street to Wharf Street WB	146	130	#DIV/0!	20	20	0
Total	1393	1361	#DIV/0!	1624	5881	0
1830-1900						
Location 6pm to 7pm						
Reid Street to Villers Street NB	16	16	#DIV/0!	200	853	#DIV/0!
Villers Street to Reid Street SB	33	28	#DIV/0!	200	1125	#DIV/0!
Bent Street NB	237	201	#DIV/0!	170	703	#DIV/0!
Bent Street SB	222	212	#DIV/0!	170	1053	#DIV/0!
Bligh Street to Villers Street NB	33	29	#DIV/0!	180	860	#DIV/0!
Villers Street to Bligh Street SB	55	57	#DIV/0!	190	1068	#DIV/0!
Spring St to Bent St via Gwydir WB	114	137	#DIV/0!	24	86	#DIV/0!
Bent St to Pacific Hwy via Gwydir EB	84	98	#DIV/0!	19	92	#DIV/0!
Spring St to Villers St via Gwydir NB	24	22	#DIV/0!	200	978	#DIV/0!
Villers St to Spring via Gwydir SB	30	30	#DIV/0!	186	1113	#DIV/0!
Wharf Street to Bent Street EB	134	135	#DIV/0!	21	366	#DIV/0!
Bent Street to Wharf Street WB	118	95	#DIV/0!	20	20	#DIV/0!
Total	1099	1059	#DIV/0!	1579	8314	#DIV/0!

Option 2B									
	Travel Time (seconds)				Counts				
	Existing AM	2013 AM	2018 AM	2028 AM	Existing AM	2013 AM	2018 AM	2028 AM	
7 to 730									
Reid Street to Villers Street NB	222	222	220	220	57	54	46	50	
Villers Street to Reid Street SB	210	210	214	216	24	31	31	37	
Bent Street NB	190	188	186	190	195	206	194	203	
Bent Street SB	180	180	180	180	152	161	166	186	
Bligh Street to Villers Street NB	198	200	200	202	35	48	43	48	
Villers Street to Bligh Street SB	200	200	200	200	19	21	21	22	
Spring St to Bent St via Gwydir WB	22	22	22	23	82	100	116	144	
Bent St to Pacific Hwy via Gwydir EB	19	19	19	21	55	69	75	94	
Spring St to Villers St via Gwydir NB	216	220	216	218	14	12	12	14	
Villers St to Spring via Gwydir SB	198	198	200	200	37	38	45	56	
Wharf Street to Bent Street EB	20	20	20	20	79	77	89	83	
Bent Street to Wharf Street WB	20	20	20	20	26	29	32	32	
Total	1695	1699	1697	1710	773	845	870	969	
730 to 8									
Location 5pm to 6pm									
Reid Street to Villers Street NB	234	234	234	236	64	66	64	59	
Villers Street to Reid Street SB	218	220	226	242	45	46	46	49	
Bent Street NB	200	198	198	202	317	347	354	329	
Bent Street SB	182	180	182	188	234	256	256	290	
Bligh Street to Villers Street NB	212	208	210	218	61	87	86	86	
Villers Street to Bligh Street SB	202	204	206	210	28	34	37	38	
Spring St to Bent St via Gwydir WB	24	24	26	28	151	175	211	257	
Bent St to Pacific Hwy via Gwydir EB	20	24	30	48	99	115	125	133	
Spring St to Villers St via Gwydir NB	228	230	232	234	28	24	30	26	
Villers St to Spring via Gwydir SB	200	200	200	202	54	64	67	84	
Wharf Street to Bent Street EB	21	21	21	22	78	79	77	85	
Bent Street to Wharf Street WB	20	20	20	20	42	43	54	60	
Total	1761	1763	1785	1850	1202	1336	1407	1496	
8 to 830									
Location 6pm to 7pm									
Reid Street to Villers Street NB	298	400	390	412	78	68	69	75	
Villers Street to Reid Street SB	222	230	244	456	54	60	64	53	
Bent Street NB	260	362	368	380	399	400	420	420	
Bent Street SB	182	184	190	236	272	281	305	258	
Bligh Street to Villers Street NB	270	370	376	376	64	92	88	96	
Villers Street to Bligh Street SB	210	210	210	276	48	44	53	41	
Spring St to Bent St via Gwydir WB	27	27	29	33	226	237	248	266	
Bent St to Pacific Hwy via Gwydir EB	25	32	45	218	108	123	137	136	
Spring St to Villers St via Gwydir NB	298	406	418	430	67	55	58	56	
Villers St to Spring via Gwydir SB	200	200	202	302	71	70	76	67	
Wharf Street to Bent Street EB	34	91	120	206	116	107	117	130	
Bent Street to Wharf Street WB	20	20	20	20	75	73	69	71	
Total	2046	2531	2612	3345	1578	1611	1706	1669	
830 to 9									
Location 6pm to 7pm									
Reid Street to Villers Street NB	538	624	626	480	60	72	67	48	
Villers Street to Reid Street SB	226	232	246	902	55	57	73	26	
Bent Street NB	486	554	558	518	392	416	392	257	
Bent Street SB	188	190	190	438	296	308	332	101	
Bligh Street to Villers Street NB	546	838	742	600	74	70	63	53	
Villers Street to Bligh Street SB	210	210	212	636	53	51	55	16	
Spring St to Bent St via Gwydir WB	29	30	32	119	251	269	280	107	
Bent St to Pacific Hwy via Gwydir EB	26	32	45	546	106	118	152	64	
Spring St to Villers St via Gwydir NB	520	588	602	584	81	96	90	43	
Villers St to Spring via Gwydir SB	200	202	202	424	74	81	84	24	
Wharf Street to Bent Street EB	522	832	792	696	84	83	86	64	
Bent Street to Wharf Street WB	20	20	20	20	68	74	80	27	
Total	3510	4351	4267	5962	1593	1697	1752	830	
9 to 930									
Location 6pm to 7pm									
Reid Street to Villers Street NB	584	626	598	118	77	72	81	74	
Villers Street to Reid Street SB	220	220	224	46	55	51	62	72	
Bent Street NB	528	552	536	530	469	468	481	462	
Bent Street SB	180	182	184	180	257	236	261	270	
Bligh Street to Villers Street NB	668	888	832	168	84	77	70	55	
Villers Street to Bligh Street SB	204	208	206	42	45	45	48	43	
Spring St to Bent St via Gwydir WB	24	25	26	5	166	170	185	209	
Bent St to Pacific Hwy via Gwydir EB	22	23	27	7	110	105	134	170	
Spring St to Villers St via Gwydir NB	564	578	556	114	55	48	47	42	
Villers St to Spring via Gwydir SB	200	200	200	40	47	46	54	70	
Wharf Street to Bent Street EB	808	896	940	170	84	77	80	100	
Bent Street to Wharf Street WB	20	20	20	13	41	51	58	16	
Total	4023	4418	4349	1433	1488	1448	1561	1583	
930 to 10									
Location 6pm to 7pm									
Reid Street to Villers Street NB	356	618	592	133	72	74	66	69	
Villers Street to Reid Street SB	220	222	230	63	57	60	56	53	
Bent Street NB	310	552	532	120	425	484	494	514	
Bent Street SB	180	184	184	48	252	249	249	249	
Bligh Street to Villers Street NB	356	746	632	140	79	110	132	158	
Villers Street to Bligh Street SB	206	210	208	53	41	47	42	54	
Spring St to Bent St via Gwydir WB	24	25	26	7	172	189	214	271	
Bent St to Pacific Hwy via Gwydir EB	22	26	32	14	116	147	156	179	
Spring St to Villers St via Gwydir NB	334	568	548	130	34	30	37	35	
Villers St to Spring via Gwydir SB	200	200	200	50	48	47	48	54	
Wharf Street to Bent Street EB	239	1078	950	203	90	69	77	100	
Bent Street to Wharf Street WB	20	20	20	5	41	47	47	59	
Total	2467	4449	4154	963	1428	1553	1617	1795	

Option 2B + Additional bridge Capacity	Travel Time (seconds)			Counts		
	2013 AM	2018 AM	2028 AM	2013 AM	2018 AM	2028 AM
7 to 730						
Reid Street to Villers Street NB	210	210	210	50	49	47
Villers Street to Reid Street SB	210	210	216	28	27	28
Bent Street NB	172	178	180	192	201	206
Bent Street SB	180	180	180	154	157	179
Bligh Street to Villers Street NB	188	190	190	47	47	56
Villers Street to Bligh Street SB	200	200	200	23	23	22
Spring St to Bent St via Gwydir WB	22	22	23	96	111	141
Bent St to Pacific Hwy via Gwydir EB	19	19	21	64	73	85
Spring St to Villers St via Gwydir NB	208	204	204	14	12	11
Villers St to Spring via Gwydir SB	190	192	194	35	40	56
Wharf Street to Bent Street EB	20	20	20	74	86	83
Bent Street to Wharf Street WB	20	20	20	28	34	37
Total	1639	1645	1659	804	860	950
730 to 8						
Location 5pm to 6pm	2013 AM	2018 AM	2028 AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	212	214	216	72	64	66
Villers Street to Reid Street SB	216	224	242	38	41	53
Bent Street NB	180	180	180	358	355	353
Bent Street SB	180	180	180	248	259	283
Bligh Street to Villers Street NB	194	192	198	88	85	87
Villers Street to Bligh Street SB	200	200	200	36	36	36
Spring St to Bent St via Gwydir WB	24	26	27	170	212	240
Bent St to Pacific Hwy via Gwydir EB	23	29	47	97	115	151
Spring St to Villers St via Gwydir NB	210	212	214	23	25	24
Villers St to Spring via Gwydir SB	194	196	200	66	76	90
Wharf Street to Bent Street EB	22	21	21	82	78	79
Bent Street to Wharf Street WB	20	20	20	51	57	53
Total	1675	1694	1745	1329	1402	1514
8 to 830						
Location 6pm to 7pm	2013 AM	2018 AM	2028 AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	224	226	228	76	74	93
Villers Street to Reid Street SB	230	242	306	61	61	55
Bent Street NB	190	190	190	496	501	500
Bent Street SB	180	180	180	289	288	265
Bligh Street to Villers Street NB	208	206	216	100	105	106
Villers Street to Bligh Street SB	200	202	206	44	47	43
Spring St to Bent St via Gwydir WB	27	29	33	243	259	280
Bent St to Pacific Hwy via Gwydir EB	36	49	121	122	138	129
Spring St to Villers St via Gwydir NB	226	228	236	72	74	70
Villers St to Spring via Gwydir SB	200	200	216	72	72	65
Wharf Street to Bent Street EB	36	51	66	189	205	222
Bent Street to Wharf Street WB	20	20	20	72	78	70
Total	1777	1823	2019	1836	1903	1896
830 to 9						
Location 6pm to 7pm	2013 AM	2018 AM	2028 AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	228	230	234	71	80	31
Villers Street to Reid Street SB	228	280	790	62	70	19
Bent Street NB	190	192	184	519	530	233
Bent Street SB	180	186	598	316	314	70
Bligh Street to Villers Street NB	210	212	336	121	123	49
Villers Street to Bligh Street SB	204	210	658	52	51	11
Spring St to Bent St via Gwydir WB	28	30	79	250	272	89
Bent St to Pacific Hwy via Gwydir EB	34	86	444	130	154	61
Spring St to Villers St via Gwydir NB	230	230	286	88	90	31
Villers St to Spring via Gwydir SB	200	230	646	81	84	17
Wharf Street to Bent Street EB	41	44	150	174	191	97
Bent Street to Wharf Street WB	20	20	20	81	84	25
Total	1792	1950	4425	1945	2044	735
9 to 930						
Location 6pm to 7pm	2013 AM	2018 AM	2028 AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	218	220	60	66	71	5
Villers Street to Reid Street SB	214	220	240	55	65	6
Bent Street NB	180	180	180	442	459	45
Bent Street SB	180	180	980	265	255	5
Bligh Street to Villers Street NB	198	198	76	82	83	5
Villers Street to Bligh Street SB	200	200	152	48	41	1
Spring St to Bent St via Gwydir WB	24	25	70	173	189	15
Bent St to Pacific Hwy via Gwydir EB	25	30	148	123	147	14
Spring St to Villers St via Gwydir NB	218	220	104	34	37	3
Villers St to Spring via Gwydir SB	196	194	300	53	50	1
Wharf Street to Bent Street EB	22	23	168	85	94	15
Bent Street to Wharf Street WB	20	20	8	45	54	5
Total	1695	1711	2486	1471	1544	120
930 to 10						
Location 6pm to 7pm	2013 AM	2018 AM	2028 AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	212	214	0	57	67	#DIV/0!
Villers Street to Reid Street SB	220	220	0	61	63	#DIV/0!
Bent Street NB	180	180	0	374	375	#DIV/0!
Bent Street SB	180	180	0	267	260	#DIV/0!
Bligh Street to Villers Street NB	192	192	0	68	68	#DIV/0!
Villers Street to Bligh Street SB	200	200	0	45	45	#DIV/0!
Spring St to Bent St via Gwydir WB	25	25	0	193	221	#DIV/0!
Bent St to Pacific Hwy via Gwydir EB	28	30	0	140	158	#DIV/0!
Spring St to Villers St via Gwydir NB	214	212	0	33	35	#DIV/0!
Villers St to Spring via Gwydir SB	192	192	0	55	50	#DIV/0!
Wharf Street to Bent Street EB	22	22	0	145	142	#DIV/0!
Bent Street to Wharf Street WB	20	20	0	40	49	#DIV/0!
Total	1685	1687	0	1478	1533	#DIV/0!

Option 2B									
	Counts				Travel Time (seconds)				
	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM	
1600-1630									
Reid Street to Villers Street NB	29	31	32	37	240	260	272	356	
Villers Street to Reid Street SB	45	47	45	29	290	310	374	538	
Bent Street NB	218	229	235	243	200	206	214	238	
Bent Street SB	400	402	398	306	252	268	310	312	
Bligh Street to Villers Street NB	53	52	51	51	214	222	230	260	
Villers Street to Bligh Street SB	97	90	90	66	276	292	334	340	
Spring St to Bent St via Gwydir WB	118	163	197	229	29	39	50	125	
Bent St to Pacific Hwy via Gwydir EB	104	121	133	97	22	27	54	158	
Spring St to Villers St via Gwydir NB	13	17	21	26	242	266	282	392	
Villers St to Spring via Gwydir SB	72	71	65	46	288	302	358	388	
Wharf Street to Bent Street EB	46	53	54	60	22	22	22	24	
Bent Street to Wharf Street WB	67	69	66	50	20	19	20	20	
Total	1262	1345	1387	1238	2095	2233	2520	3151	
1630-1700									
Reid Street to Villers Street NB	29	30	37	18	236	248	256	0	
Villers Street to Reid Street SB	60	49	53	10	360	374	394	0	
Bent Street NB	198	237	244	250	196	206	208	48	
Bent Street SB	468	455	441	NA	326	336	344	0	
Bligh Street to Villers Street NB	57	66	62	36	208	222	222	0	
Villers Street to Bligh Street SB	110	109	99	32	346	358	366	0	
Spring St to Bent St via Gwydir WB	114	159	208	68	32	37	48	14	
Bent St to Pacific Hwy via Gwydir EB	123	126	139	31	21	25	32	0	
Spring St to Villers St via Gwydir NB	11	17	30	22	232	254	266	0	
Villers St to Spring via Gwydir SB	89	89	80	19	360	372	384	0	
Wharf Street to Bent Street EB	61	65	71	58	21	23	23	12	
Bent Street to Wharf Street WB	71	83	69	20	20	20	20	0	
Total	1302	1406	1444	537	2357	2475	2563	73	
1700-1730									
Location 6pm to 7pm	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM	
Reid Street to Villers Street NB	29	38	43	#DIV/0!	248	252	292	0	
Villers Street to Reid Street SB	72	62	67	#DIV/0!	380	378	418	0	
Bent Street NB	229	239	260	0	208	210	216	48	
Bent Street SB	426	439	453	0	338	342	346	0	
Bligh Street to Villers Street NB	64	71	70	#DIV/0!	228	224	234	0	
Villers Street to Bligh Street SB	104	101	106	#DIV/0!	364	368	370	0	
Spring St to Bent St via Gwydir WB	147	173	206	1	31	36	75	14	
Bent St to Pacific Hwy via Gwydir EB	157	149	178	#DIV/0!	22	23	50	0	
Spring St to Villers St via Gwydir NB	17	23	26	#DIV/0!	252	258	314	0	
Villers St to Spring via Gwydir SB	59	72	77	#DIV/0!	378	380	404	0	
Wharf Street to Bent Street EB	108	128	177	18	22	23	28	12	
Bent Street to Wharf Street WB	114	106	109	#DIV/0!	20	20	20	0	
Total	1526	1600	1772	#DIV/0!	2490	2514	2767	73	
1730-1800									
Location 6pm to 7pm	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM	
Reid Street to Villers Street NB	29	35	45	#DIV/0!	236	240	250	0	
Villers Street to Reid Street SB	68	73	71	#DIV/0!	370	380	382	0	
Bent Street NB	218	248	250	#DIV/0!	196	200	206	0	
Bent Street SB	424	442	441	#DIV/0!	338	336	336	0	
Bligh Street to Villers Street NB	55	63	56	#DIV/0!	212	210	220	0	
Villers Street to Bligh Street SB	110	114	117	#DIV/0!	356	362	362	0	
Spring St to Bent St via Gwydir WB	133	159	185	#DIV/0!	29	32	42	0	
Bent St to Pacific Hwy via Gwydir EB	140	157	162	#DIV/0!	20	23	26	0	
Spring St to Villers St via Gwydir NB	16	18	20	#DIV/0!	246	246	258	0	
Villers St to Spring via Gwydir SB	52	55	57	#DIV/0!	374	376	370	0	
Wharf Street to Bent Street EB	46	64	87	#DIV/0!	20	22	23	0	
Bent Street to Wharf Street WB	132	121	126	#DIV/0!	20	20	20	0	
Total	1423	1550	1618	#DIV/0!	2417	2446	2494	0	
1800-1830									
Location 6pm to 7pm	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM	
Reid Street to Villers Street NB	13	17	15	#DIV/0!	234	238	244	0	
Villers Street to Reid Street SB	60	65	69	#DIV/0!	378	378	376	0	
Bent Street NB	201	223	224	#DIV/0!	200	202	204	0	
Bent Street SB	374	400	414	#DIV/0!	340	340	338	0	
Bligh Street to Villers Street NB	31	33	37	#DIV/0!	210	210	220	0	
Villers Street to Bligh Street SB	95	107	115	#DIV/0!	362	362	358	0	
Spring St to Bent St via Gwydir WB	111	142	163	#DIV/0!	27	28	34	0	
Bent St to Pacific Hwy via Gwydir EB	124	141	154	#DIV/0!	19	21	23	0	
Spring St to Villers St via Gwydir NB	13	15	21	#DIV/0!	234	238	254	0	
Villers St to Spring via Gwydir SB	49	50	54	#DIV/0!	378	382	380	0	
Wharf Street to Bent Street EB	76	89	108	#DIV/0!	21	22	22	0	
Bent Street to Wharf Street WB	158	144	146	#DIV/0!	20	20	20	0	
Total	1306	1424	1519	#DIV/0!	2423	2441	2473	0	
1830-1900									
Location 6pm to 7pm	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM	
Reid Street to Villers Street NB	11	12	13	#DIV/0!	232	228	236	0	
Villers Street to Reid Street SB	41	47	46	#DIV/0!	356	376	396	0	
Bent Street NB	176	176	182	#DIV/0!	198	192	190	0	
Bent Street SB	298	320	308	#DIV/0!	328	346	360	0	
Bligh Street to Villers Street NB	30	27	27	#DIV/0!	208	206	204	0	
Villers Street to Bligh Street SB	76	83	82	#DIV/0!	346	368	386	0	
Spring St to Bent St via Gwydir WB	87	102	127	#DIV/0!	24	25	27	0	
Bent St to Pacific Hwy via Gwydir EB	95	104	114	#DIV/0!	19	19	20	0	
Spring St to Villers St via Gwydir NB	13	14	14	#DIV/0!	232	230	232	0	
Villers St to Spring via Gwydir SB	38	47	45	#DIV/0!	368	382	396	0	
Wharf Street to Bent Street EB	115	132	154	#DIV/0!	20	21	21	0	
Bent Street to Wharf Street WB	159	165	150	#DIV/0!	20	20	20	0	
Total	1139	1231	1261	#DIV/0!	2351	2413	2488	0	

Option 2B + Additional bridge Capacity							
	Counts			Travel Time (seconds)			
	2013 PM	2018 PM	2028 PM	2013 PM	2018 PM	2028 PM	
1600-1630							
Reid Street to Villers Street NB	35	33	34	230	248	282	
Villers Street to Reid Street SB	56	52	27	230	252	494	
Bent Street NB	223	250	271	180	182	188	
Bent Street SB	465	472	294	190	192	202	
Bligh Street to Villers Street NB	54	57	56	196	200	216	
Villers Street to Bligh Street SB	103	101	64	210	216	228	
Spring St to Bent St via Gwydir WB	165	200	221	41	63	93	
Bent St to Pacific Hwy via Gwydir EB	125	136	81	26	48	258	
Spring St to Villers St via Gwydir NB	19	24	35	238	260	310	
Villers St to Spring via Gwydir SB	89	88	41	226	238	334	
Wharf Street to Bent Street EB	51	52	58	21	22	22	
Bent Street to Wharf Street WB	72	77	57	20	20	20	
Total	1457	1542	1239	1808	1941	2647	
1630-1700							
Reid Street to Villers Street NB	28	30	3	232	242	0	
Villers Street to Reid Street SB	60	62	2	230	246	0	
Bent Street NB	223	224	NA	180	180	0	
Bent Street SB	546	585	NA	190	194	0	
Bligh Street to Villers Street NB	51	60	6	196	198	0	
Villers Street to Bligh Street SB	127	138	5	210	216	0	
Spring St to Bent St via Gwydir WB	145	195	7	43	59	14	
Bent St to Pacific Hwy via Gwydir EB	129	150	7	24	34	0	
Spring St to Villers St via Gwydir NB	18	24	3	238	258	0	
Villers St to Spring via Gwydir SB	110	115	2	222	236	0	
Wharf Street to Bent Street EB	69	69	38	22	22	4	
Bent Street to Wharf Street WB	87	82	2	20	20	0	
Total	1506	1641	69	1808	1905	17	
1700-1730							
Location 6pm to 7pm							
Reid Street to Villers Street NB	33	39	#DIV/0!	232	270	0	
Villers Street to Reid Street SB	86	81	#DIV/0!	232	288	0	
Bent Street NB	229	251	#DIV/0!	180	184	0	
Bent Street SB	536	541	#DIV/0!	192	204	0	
Bligh Street to Villers Street NB	69	69	#DIV/0!	194	200	0	
Villers Street to Bligh Street SB	138	149	#DIV/0!	220	230	0	
Spring St to Bent St via Gwydir WB	177	191	1	43	103	14	
Bent St to Pacific Hwy via Gwydir EB	187	185	#DIV/0!	28	60	0	
Spring St to Villers St via Gwydir NB	18	18	#DIV/0!	234	290	0	
Villers St to Spring via Gwydir SB	71	80	#DIV/0!	228	254	0	
Wharf Street to Bent Street EB	132	183	3	23	26	4	
Bent Street to Wharf Street WB	133	126	#DIV/0!	20	20	0	
Total	1809	1913	#DIV/0!	1826	2129	17	
1730-1800							
Location 6pm to 7pm							
Reid Street to Villers Street NB	41	37	#DIV/0!	228	256	0	
Villers Street to Reid Street SB	82	104	#DIV/0!	222	248	0	
Bent Street NB	245	245	#DIV/0!	180	180	0	
Bent Street SB	512	590	#DIV/0!	190	194	0	
Bligh Street to Villers Street NB	54	53	#DIV/0!	198	194	0	
Villers Street to Bligh Street SB	135	156	#DIV/0!	210	218	0	
Spring St to Bent St via Gwydir WB	164	189	#DIV/0!	40	70	0	
Bent St to Pacific Hwy via Gwydir EB	165	204	#DIV/0!	24	35	0	
Spring St to Villers St via Gwydir NB	21	22	#DIV/0!	240	270	0	
Villers St to Spring via Gwydir SB	72	78	#DIV/0!	222	234	0	
Wharf Street to Bent Street EB	63	89	#DIV/0!	21	23	0	
Bent Street to Wharf Street WB	139	140	#DIV/0!	20	20	0	
Total	1694	1907	#DIV/0!	1795	1942	0	
1800-1830							
Location 6pm to 7pm							
Reid Street to Villers Street NB	16	17	#DIV/0!	220	224	0	
Villers Street to Reid Street SB	53	62	#DIV/0!	218	226	0	
Bent Street NB	215	216	#DIV/0!	180	180	0	
Bent Street SB	337	358	#DIV/0!	180	184	0	
Bligh Street to Villers Street NB	32	31	#DIV/0!	192	196	0	
Villers Street to Bligh Street SB	89	95	#DIV/0!	202	208	0	
Spring St to Bent St via Gwydir WB	146	169	#DIV/0!	27	32	0	
Bent St to Pacific Hwy via Gwydir EB	125	148	#DIV/0!	21	25	0	
Spring St to Villers St via Gwydir NB	21	21	#DIV/0!	224	226	0	
Villers St to Spring via Gwydir SB	47	49	#DIV/0!	216	222	0	
Wharf Street to Bent Street EB	92	129	#DIV/0!	21	22	0	
Bent Street to Wharf Street WB	142	153	#DIV/0!	20	20	0	
Total	1314	1447	#DIV/0!	1721	1765	0	
1830-1900							
Location 6pm to 7pm							
Reid Street to Villers Street NB	11	12	#DIV/0!	210	212	#DIV/0!	
Villers Street to Reid Street SB	33	34	#DIV/0!	210	210	#DIV/0!	
Bent Street NB	178	182	#DIV/0!	180	180	#DIV/0!	
Bent Street SB	210	218	#DIV/0!	180	180	#DIV/0!	
Bligh Street to Villers Street NB	28	29	#DIV/0!	190	190	#DIV/0!	
Villers Street to Bligh Street SB	50	58	#DIV/0!	200	200	#DIV/0!	
Spring St to Bent St via Gwydir WB	103	123	#DIV/0!	22	24	#DIV/0!	
Bent St to Pacific Hwy via Gwydir EB	84	99	#DIV/0!	19	20	#DIV/0!	
Spring St to Villers St via Gwydir NB	13	13	#DIV/0!	212	216	#DIV/0!	
Villers St to Spring via Gwydir SB	30	32	#DIV/0!	212	212	#DIV/0!	
Wharf Street to Bent Street EB	125	158	#DIV/0!	21	21	#DIV/0!	
Bent Street to Wharf Street WB	113	117	#DIV/0!	19	20	#DIV/0!	
Total	979	1076	#DIV/0!	1675	1685	#DIV/0!	

Option 3								
7 to 730	Travel Time (seconds)				Counts			
	Existing AM	2013 AM	2018 AM	2028 AM	Existing AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	218	212	218	216	12	14	15	17
Villers Street to Reid Street SB	178	180	180	180	199	207	219	227
Bent Street NB	170	170	170	170	126	133	141	148
Bent Street SB	194	194	196	194	31	40	49	48
Bligh Street to Villers Street NB	192	190	190	194	19	20	23	26
Villers Street to Bligh Street SB	16	16	16	16	70	79	86	89
Spring St to Bent St via Gwydir WB	190	190	190	190	29	33	37	41
Bent St to Pacific Hwy via Gwydir EB	20	20	20	20	78	82	82	86
Spring St to Villers St via Gwydir NB	20	20	20	20	27	28	36	32
Villers St to Spring via Gwydir SB	182	90	0	0	1	1	#DIV/0!	#DIV/0!
Wharf Street to Bent Street EB	216	220	220	220	50	48	50	54
Bent Street to Wharf Street WB	40	22	0	0	1	1	#DIV/0!	#DIV/0!
Total	1636	1524	1420	1420	643	687	#DIV/0!	#DIV/0!
730 to 8								
Location 5pm to 6pm	Existing AM	2013 AM	2018 AM	2028 AM	Existing AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	216	218	220	218	18	20	25	22
Villers Street to Reid Street SB	184	184	188	184	355	368	372	367
Bent Street NB	170	170	176	176	208	215	225	224
Bent Street SB	212	212	214	212	53	83	80	75
Bligh Street to Villers Street NB	196	192	194	198	33	36	40	34
Villers Street to Bligh Street SB	16	16	16	16	112	129	140	147
Spring St to Bent St via Gwydir WB	190	190	190	190	44	53	58	68
Bent St to Pacific Hwy via Gwydir EB	21	22	22	21	67	76	83	78
Spring St to Villers St via Gwydir NB	20	20	20	20	43	54	55	56
Villers St to Spring via Gwydir SB	0	0	154	102	#DIV/0!	#DIV/0!	1	2
Wharf Street to Bent Street EB	230	230	236	234	68	63	66	63
Bent Street to Wharf Street WB	10	24	37	39	1	1	1	1
Total	1466	1477	1667	1610	#DIV/0!	#DIV/0!	1146	1137
8 to 830								
Location 6pm to 7pm	Existing AM	2013 AM	2018 AM	2028 AM	Existing AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	220	218	220	224	25	24	29	34
Villers Street to Reid Street SB	258	298	290	290	443	462	461	451
Bent Street NB	178	176	180	180	235	244	254	281
Bent Street SB	314	406	472	508	66	90	80	74
Bligh Street to Villers Street NB	198	198	196	200	46	45	49	52
Villers Street to Bligh Street SB	16	16	16	16	127	134	152	185
Spring St to Bent St via Gwydir WB	190	190	190	194	55	58	64	76
Bent St to Pacific Hwy via Gwydir EB	39	74	57	90	119	120	138	155
Spring St to Villers St via Gwydir NB	20	20	20	20	67	64	76	69
Villers St to Spring via Gwydir SB	222	336	138	276	2	2	2	1
Wharf Street to Bent Street EB	304	344	338	344	67	63	68	68
Bent Street to Wharf Street WB	48	55	68	63	2	2	2	3
Total	2007	2330	2185	2405	1254	1307	1375	1449
830 to 9								
Location 6pm to 7pm	Existing AM	2013 AM	2018 AM	2028 AM	Existing AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	220	268	268	276	25	30	30	40
Villers Street to Reid Street SB	486	524	516	490	475	489	484	490
Bent Street NB	180	180	180	182	256	271	283	290
Bent Street SB	578	800	804	778	69	63	64	67
Bligh Street to Villers Street NB	200	200	200	202	48	48	56	54
Villers Street to Bligh Street SB	16	16	16	16	131	131	146	182
Spring St to Bent St via Gwydir WB	192	194	192	198	59	71	72	83
Bent St to Pacific Hwy via Gwydir EB	506	786	742	708	93	80	91	103
Spring St to Villers St via Gwydir NB	20	20	20	20	72	76	76	81
Villers St to Spring via Gwydir SB	404	264	258	222	2	3	3	1
Wharf Street to Bent Street EB	536	588	610	594	61	64	45	36
Bent Street to Wharf Street WB	37	40	126	180	2	3	3	2
Total	3375	3880	3932	3866	1292	1331	1352	1430
9 to 930								
Location 6pm to 7pm	Existing AM	2013 AM	2018 AM	2028 AM	Existing AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	218	222	228	222	25	32	30	40
Villers Street to Reid Street SB	518	536	520	486	521	516	517	530
Bent Street NB	170	172	170	174	219	224	225	238
Bent Street SB	708	930	840	762	81	61	61	71
Bligh Street to Villers Street NB	194	194	194	192	49	48	56	51
Villers Street to Bligh Street SB	16	16	16	16	114	116	121	157
Spring St to Bent St via Gwydir WB	190	190	190	190	49	53	54	68
Bent St to Pacific Hwy via Gwydir EB	690	904	818	798	83	79	88	99
Spring St to Villers St via Gwydir NB	20	20	20	20	46	51	66	67
Villers St to Spring via Gwydir SB	378	586	0	128	2	1	#DIV/0!	1
Wharf Street to Bent Street EB	578	606	598	558	55	65	71	56
Bent Street to Wharf Street WB	23	120	0	110	2	1	#DIV/0!	1
Total	3702	4496	3594	3656	1247	1246	#DIV/0!	1381
930 to 10								
Location 6pm to 7pm	Existing AM	2013 AM	2018 AM	2028 AM	Existing AM	2013 AM	2018 AM	2028 AM
Reid Street to Villers Street NB	218	220	220	220	24	30	28	29
Villers Street to Reid Street SB	346	502	524	470	491	538	538	532
Bent Street NB	170	174	172	174	199	228	240	231
Bent Street SB	406	592	684	636	83	149	117	105
Bligh Street to Villers Street NB	192	198	200	196	42	48	52	51
Villers Street to Bligh Street SB	16	16	16	16	93	159	162	168
Spring St to Bent St via Gwydir WB	190	190	190	190	43	53	54	54
Bent St to Pacific Hwy via Gwydir EB	205	996	1012	780	93	82	71	108
Spring St to Villers St via Gwydir NB	20	20	20	20	43	48	49	57
Villers St to Spring via Gwydir SB	396	0	214	86	1	#DIV/0!	2	3
Wharf Street to Bent Street EB	404	564	584	536	58	54	54	81
Bent Street to Wharf Street WB	45	12	26	41	1	1	3	1
Total	2608	3484	3862	3365	1171	#DIV/0!	1369	1421

Option 3 + Additional bridge Capacity						
	Travel Time (seconds)			Counts		
	2013 AM	2018 AM	2028 AM	2013 AM	2018 AM	2028 AM
7 to 730						
Reid Street to Villers Street NB	214	214	210	12	14	18
Villers Street to Reid Street SB	176	174	170	220	214	220
Bent Street NB	170	170	170	147	135	148
Bent Street SB	192	190	190	46	44	51
Bligh Street to Villers Street NB	190	190	190	25	20	23
Villers Street to Bligh Street SB	16	16	16	78	79	103
Spring St to Bent St via Gwydir WB	188	186	186	34	35	45
Bent St to Pacific Hwy via Gwydir EB	20	20	20	82	89	91
Spring St to Villers St via Gwydir NB	20	20	20	25	34	35
Villers St to Spring via Gwydir SB	92	48	0	1	1	#DIV/0!
Wharf Street to Bent Street EB	218	214	218	51	53	50
Bent Street to Wharf Street WB	19	20	0	1	1	#DIV/0!
Total	1514	1462	1390	723	719	#DIV/0!
730 to 8						
Location 5pm to 6pm						
Reid Street to Villers Street NB	212	216	216	20	20	27
Villers Street to Reid Street SB	180	180	180	375	364	374
Bent Street NB	170	170	170	214	231	231
Bent Street SB	204	218	214	81	78	81
Bligh Street to Villers Street NB	190	190	192	37	34	41
Villers Street to Bligh Street SB	16	16	16	129	135	139
Spring St to Bent St via Gwydir WB	190	190	190	55	58	66
Bent St to Pacific Hwy via Gwydir EB	21	21	21	76	82	77
Spring St to Villers St via Gwydir NB	20	20	20	44	53	54
Villers St to Spring via Gwydir SB	150	96	148	2	2	1
Wharf Street to Bent Street EB	222	222	224	58	57	59
Bent Street to Wharf Street WB	52	12	50	2	2	1
Total	1627	1552	1641	1092	1116	1151
8 to 830						
Location 6pm to 7pm						
Reid Street to Villers Street NB	218	218	220	30	31	33
Villers Street to Reid Street SB	186	184	186	551	527	527
Bent Street NB	170	170	170	251	260	274
Bent Street SB	262	320	378	104	98	94
Bligh Street to Villers Street NB	190	190	190	54	50	55
Villers Street to Bligh Street SB	16	16	16	145	164	188
Spring St to Bent St via Gwydir WB	190	190	190	62	70	73
Bent St to Pacific Hwy via Gwydir EB	39	39	79	189	198	217
Spring St to Villers St via Gwydir NB	20	20	20	69	64	75
Villers St to Spring via Gwydir SB	146	156	164	2	2	1
Wharf Street to Bent Street EB	232	234	232	79	77	70
Bent Street to Wharf Street WB	45	65	89	2	2	3
Total	1714	1803	1934	1538	1542	1610
830 to 9						
Location 6pm to 7pm						
Reid Street to Villers Street NB	220	232	238	32	29	38
Villers Street to Reid Street SB	190	188	184	588	553	539
Bent Street NB	170	170	170	261	282	303
Bent Street SB	346	372	380	103	99	89
Bligh Street to Villers Street NB	190	190	194	47	59	60
Villers Street to Bligh Street SB	16	16	17	156	165	194
Spring St to Bent St via Gwydir WB	190	190	190	73	67	77
Bent St to Pacific Hwy via Gwydir EB	36	39	140	174	196	226
Spring St to Villers St via Gwydir NB	20	20	20	83	80	83
Villers St to Spring via Gwydir SB	200	146	110	2	1	3
Wharf Street to Bent Street EB	248	260	272	60	52	44
Bent Street to Wharf Street WB	61	117	137	2	1	3
Total	1886	1940	2051	1581	1583	1659
9 to 930						
Location 6pm to 7pm						
Reid Street to Villers Street NB	214	220	222	30	31	32
Villers Street to Reid Street SB	180	180	180	558	565	575
Bent Street NB	170	170	170	214	229	241
Bent Street SB	304	338	390	104	112	93
Bligh Street to Villers Street NB	190	190	190	49	55	47
Villers Street to Bligh Street SB	16	16	16	129	143	160
Spring St to Bent St via Gwydir WB	188	190	190	51	54	62
Bent St to Pacific Hwy via Gwydir EB	24	26	36	79	82	107
Spring St to Villers St via Gwydir NB	20	20	20	46	55	61
Villers St to Spring via Gwydir SB	164	202	104	1	1	1
Wharf Street to Bent Street EB	232	234	238	63	75	77
Bent Street to Wharf Street WB	56	53	46	2	1	1
Total	1758	1839	1803	1326	1405	1456
930 to 10						
Location 6pm to 7pm						
Reid Street to Villers Street NB	210	218	218	26	27	27
Villers Street to Reid Street SB	180	180	180	419	462	479
Bent Street NB	170	170	170	212	210	230
Bent Street SB	198	242	302	69	95	123
Bligh Street to Villers Street NB	190	192	190	50	42	51
Villers Street to Bligh Street SB	16	16	16	113	143	172
Spring St to Bent St via Gwydir WB	190	190	190	48	47	53
Bent St to Pacific Hwy via Gwydir EB	23	23	25	137	150	150
Spring St to Villers St via Gwydir NB	20	20	20	42	51	47
Villers St to Spring via Gwydir SB	190	142	148	1	1	1
Wharf Street to Bent Street EB	222	220	234	54	53	61
Bent Street to Wharf Street WB	47	31	49	1	1	1
Total	1656	1644	1742	1172	1283	1395

Option 3								
	Travel Time (seconds)				Counts			
	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM
1600-1630								
Reid Street to Villers Street NB	236	222	234	246	17	18	18	19
Villers Street to Reid Street SB	182	180	186	190	193	205	224	249
Bent Street NB	186	188	192	208	314	317	348	357
Bent Street SB	200	202	204	214	44	46	49	50
Bligh Street to Villers Street NB	214	206	216	238	76	81	89	86
Villers Street to Bligh Street SB	16	16	16	16	98	99	104	110
Spring St to Bent St via Gwydir WB	206	200	206	218	50	51	50	54
Bent St to Pacific Hwy via Gwydir EB	21	21	22	23	58	62	65	58
Spring St to Villers St via Gwydir NB	20	20	20	20	58	56	55	56
Villers St to Spring via Gwydir SB	160	58	0	62	1	1	#DIV/0!	1
Wharf Street to Bent Street EB	226	228	234	250	31	30	30	26
Bent Street to Wharf Street WB	64	11	50	77	1	1	1	2
Total	1730	1553	1580	1762	941	967	#DIV/0!	1068
1630-1700								
Reid Street to Villers Street NB	330	354	350	384	30	29	23	23
Villers Street to Reid Street SB	198	200	204	218	318	332	348	361
Bent Street NB	292	310	322	332	436	416	409	382
Bent Street SB	216	228	234	272	76	76	71	76
Bligh Street to Villers Street NB	312	330	342	354	115	103	99	98
Villers Street to Bligh Street SB	16	16	16	17	150	151	141	139
Spring St to Bent St via Gwydir WB	306	328	332	346	77	73	65	58
Bent St to Pacific Hwy via Gwydir EB	23	24	24	25	57	62	63	60
Spring St to Villers St via Gwydir NB	20	20	20	20	77	73	73	66
Villers St to Spring via Gwydir SB	160	70	76	292	1	2	2	1
Wharf Street to Bent Street EB	270	290	292	336	36	28	29	21
Bent Street to Wharf Street WB	47	52	42	254	2	2	4	2
Total	2189	2222	2254	2850	1374	1348	1328	1286
1700-1730								
Location 6pm to 7pm	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM
Reid Street to Villers Street NB	376	378	298	174	32	29	34	17
Villers Street to Reid Street SB	226	316	326	300	343	378	336	160
Bent Street NB	326	330	333	377	401	419	416	166
Bent Street SB	248	376	404	318	71	82	73	41
Bligh Street to Villers Street NB	344	352	284	238	107	117	111	39
Villers Street to Bligh Street SB	16	16	16	10	158	170	143	79
Spring St to Bent St via Gwydir WB	344	348	278	232	67	62	72	24
Bent St to Pacific Hwy via Gwydir EB	22	29	38	34	91	103	114	63
Spring St to Villers St via Gwydir NB	20	20	20	16	113	98	90	31
Villers St to Spring via Gwydir SB	306	416	348	158	2	2	3	2
Wharf Street to Bent Street EB	322	388	492	590	32	43	43	14
Bent Street to Wharf Street WB	72	64	80	70	2	4	7	3
Total	2623	3033	2917	2516	1418	1506	1442	639
1730-1800								
Location 6pm to 7pm	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM
Reid Street to Villers Street NB	370	376	296	114	36	32	41	4
Villers Street to Reid Street SB	190	194	160	68	297	325	353	148
Bent Street NB	326	326	260	74	390	393	415	56
Bent Street SB	212	218	182	90	71	79	84	17
Bligh Street to Villers Street NB	346	354	280	78	110	121	119	18
Villers Street to Bligh Street SB	16	16	13	3	156	162	172	35
Spring St to Bent St via Gwydir WB	338	342	276	74	59	61	71	10
Bent St to Pacific Hwy via Gwydir EB	22	22	20	5	75	94	116	72
Spring St to Villers St via Gwydir NB	20	20	16	4	129	123	123	34
Villers St to Spring via Gwydir SB	158	268	210	0	2	2	4	#DIV/0!
Wharf Street to Bent Street EB	246	248	210	170	25	29	42	11
Bent Street to Wharf Street WB	36	51	55	0	2	5	6	#DIV/0!
Total	2280	2435	1977	680	1351	1427	1547	#DIV/0!
1800-1830								
Location 6pm to 7pm	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM
Reid Street to Villers Street NB	372	370	304	0	26	31	36	#DIV/0!
Villers Street to Reid Street SB	182	188	150	0	273	280	288	#DIV/0!
Bent Street NB	334	326	258	0	341	354	366	#DIV/0!
Bent Street SB	204	206	166	0	40	45	44	#DIV/0!
Bligh Street to Villers Street NB	350	346	280	0	98	99	106	#DIV/0!
Villers Street to Bligh Street SB	16	16	13	0	107	120	115	#DIV/0!
Spring St to Bent St via Gwydir WB	346	342	280	0	52	58	60	#DIV/0!
Bent St to Pacific Hwy via Gwydir EB	21	21	17	0	70	78	95	#DIV/0!
Spring St to Villers St via Gwydir NB	20	20	16	0	151	150	145	#DIV/0!
Villers St to Spring via Gwydir SB	48	46	106	0	1	1	1	#DIV/0!
Wharf Street to Bent Street EB	234	244	194	0	9	10	11	#DIV/0!
Bent Street to Wharf Street WB	12	10	46	0	1	1	1	#DIV/0!
Total	2139	2135	1829	0	1169	1227	1267	#DIV/0!
1830-1900								
Location 6pm to 7pm	Existing PM	2013 PM	2018 PM	2028 PM	Existing PM	2013 PM	2018 PM	2028 PM
Reid Street to Villers Street NB	378	380	312	0	20	23	17	#DIV/0!
Villers Street to Reid Street SB	190	186	152	0	267	261	270	#DIV/0!
Bent Street NB	334	336	274	0	278	274	261	#DIV/0!
Bent Street SB	202	202	166	0	37	37	33	#DIV/0!
Bligh Street to Villers Street NB	352	356	292	0	83	85	78	#DIV/0!
Villers Street to Bligh Street SB	16	16	13	0	96	99	103	#DIV/0!
Spring St to Bent St via Gwydir WB	356	358	288	0	41	40	34	#DIV/0!
Bent St to Pacific Hwy via Gwydir EB	21	22	18	0	138	146	172	#DIV/0!
Spring St to Villers St via Gwydir NB	20	20	16	0	163	172	153	#DIV/0!
Villers St to Spring via Gwydir SB	98	100	156	0	2	1	2	#DIV/0!
Wharf Street to Bent Street EB	234	230	190	0	5	5	8	#DIV/0!
Bent Street to Wharf Street WB	34	26	37	0	1	1	2	#DIV/0!
Total	2236	2231	1914	0	1130	1143	1132	#DIV/0!

Option 3 + Additional bridge Capacity						
	Travel Time (seconds)			Counts		
	2013 PM	2018 PM	2028 PM	2013 PM	2018 PM	2028 PM
1600-1630						
Reid Street to Villers Street NB	212	218	222	18	24	22
Villers Street to Reid Street SB	178	180	180	213	232	260
Bent Street NB	172	176	178	347	368	386
Bent Street SB	192	200	200	46	48	55
Bligh Street to Villers Street NB	194	196	200	91	87	91
Villers Street to Bligh Street SB	16	16	16	100	105	121
Spring St to Bent St via Gwydir WB	190	190	192	53	56	59
Bent St to Pacific Hwy via Gwydir EB	21	21	23	58	71	66
Spring St to Villers St via Gwydir NB	20	20	20	59	63	53
Villers St to Spring via Gwydir SB	46	0	100	1	#DIV/0!	1
Wharf Street to Bent Street EB	222	228	234	27	31	25
Bent Street to Wharf Street WB	10	38	59	1	2	1
Total	1473	1483	1624	1015	#DIV/0!	1140
1630-1700						
	2013 PM	2018 PM	2028 PM	2013 PM	2018 PM	2028 PM
Reid Street to Villers Street NB	226	230	262	29	30	22
Villers Street to Reid Street SB	180	180	180	367	363	286
Bent Street NB	180	184	212	501	507	382
Bent Street SB	216	214	230	81	80	71
Bligh Street to Villers Street NB	202	208	236	136	118	94
Villers Street to Bligh Street SB	16	17	16	152	156	122
Spring St to Bent St via Gwydir WB	196	200	230	73	75	56
Bent St to Pacific Hwy via Gwydir EB	23	24	24	59	61	58
Spring St to Villers St via Gwydir NB	20	20	20	93	89	74
Villers St to Spring via Gwydir SB	164	74	122	2	1	1
Wharf Street to Bent Street EB	264	276	416	31	25	15
Bent Street to Wharf Street WB	162	92	46	2	2	1
Total	1849	1719	1995	1525	1508	1183
1700-1730						
	2013 PM	2018 PM	2028 PM	2013 PM	2018 PM	2028 PM
Location 6pm to 7pm						
Reid Street to Villers Street NB	220	296	100	45	17	6
Villers Street to Reid Street SB	180	182	185	372	203	39
Bent Street NB	180	190	240	514	281	17
Bent Street SB	218	250	120	80	51	13
Bligh Street to Villers Street NB	200	172	62	143	81	4
Villers Street to Bligh Street SB	16	13	3	190	101	17
Spring St to Bent St via Gwydir WB	192	164	56	86	41	8
Bent St to Pacific Hwy via Gwydir EB	23	22	20	105	82	18
Spring St to Villers St via Gwydir NB	20	20	8	128	57	7
Villers St to Spring via Gwydir SB	254	214	0	4	2	#DIV/0!
Wharf Street to Bent Street EB	290	584	162	41	22	2
Bent Street to Wharf Street WB	71	142	0	4	4	#DIV/0!
Total	1864	2249	956	1711	941	#DIV/0!
1730-1800						
	2013 PM	2018 PM	2028 PM	2013 PM	2018 PM	2028 PM
Location 6pm to 7pm						
Reid Street to Villers Street NB	224	88	0	45	48	#DIV/0!
Villers Street to Reid Street SB	180	72	0	308	349	#DIV/0!
Bent Street NB	180	72	0	517	548	#DIV/0!
Bent Street SB	200	82	0	72	73	#DIV/0!
Bligh Street to Villers Street NB	202	82	0	155	153	#DIV/0!
Villers Street to Bligh Street SB	16	6	0	179	205	#DIV/0!
Spring St to Bent St via Gwydir WB	196	80	0	78	95	#DIV/0!
Bent St to Pacific Hwy via Gwydir EB	22	9	0	91	123	#DIV/0!
Spring St to Villers St via Gwydir NB	20	8	0	156	164	#DIV/0!
Villers St to Spring via Gwydir SB	262	118	0	2	5	#DIV/0!
Wharf Street to Bent Street EB	262	108	0	29	43	#DIV/0!
Bent Street to Wharf Street WB	120	40	0	3	7	#DIV/0!
Total	1885	766	0	1636	1810	#DIV/0!
1800-1830						
	2013 PM	2018 PM	2028 PM	2013 PM	2018 PM	2028 PM
Location 6pm to 7pm						
Reid Street to Villers Street NB	214	88	0	25	30	#DIV/0!
Villers Street to Reid Street SB	180	72	0	273	320	#DIV/0!
Bent Street NB	170	72	0	270	362	#DIV/0!
Bent Street SB	200	80	0	40	50	#DIV/0!
Bligh Street to Villers Street NB	192	80	0	81	104	#DIV/0!
Villers Street to Bligh Street SB	16	6	0	105	123	#DIV/0!
Spring St to Bent St via Gwydir WB	188	76	0	44	60	#DIV/0!
Bent St to Pacific Hwy via Gwydir EB	21	9	0	78	92	#DIV/0!
Spring St to Villers St via Gwydir NB	20	8	0	125	153	#DIV/0!
Villers St to Spring via Gwydir SB	98	48	0	2	1	#DIV/0!
Wharf Street to Bent Street EB	234	92	0	9	10	#DIV/0!
Bent Street to Wharf Street WB	41	30	0	1	2	#DIV/0!
Total	1575	662	0	1054	1305	#DIV/0!
1830-1900						
	2013 PM	2018 PM	2028 PM	2013 PM	2018 PM	2028 PM
Location 6pm to 7pm						
Reid Street to Villers Street NB	210	84	0	19	19	#DIV/0!
Villers Street to Reid Street SB	180	72	0	246	260	#DIV/0!
Bent Street NB	170	68	0	217	223	#DIV/0!
Bent Street SB	194	78	0	35	36	#DIV/0!
Bligh Street to Villers Street NB	190	76	0	65	62	#DIV/0!
Villers Street to Bligh Street SB	16	6	0	87	99	#DIV/0!
Spring St to Bent St via Gwydir WB	190	72	0	33	41	#DIV/0!
Bent St to Pacific Hwy via Gwydir EB	21	9	0	136	171	#DIV/0!
Spring St to Villers St via Gwydir NB	20	8	0	122	110	#DIV/0!
Villers St to Spring via Gwydir SB	96	46	0	2	1	#DIV/0!
Wharf Street to Bent Street EB	222	88	0	6	4	#DIV/0!
Bent Street to Wharf Street WB	35	9	0	2	1	#DIV/0!
Total	1544	617	0	969	1026	#DIV/0!

Appendix F

Options Testing – Network Evaluation Summary

OPTION 1 4:30PM - 5:30PM																												
Existing	Measured Totals												Estimated Totals						Resultant Derived Averages (per vehicle)									
	All	Cars	Light	Heavy	Freeflow	Trip Time	Distance	Cars	Light	Heavy	Time	Distance	Cars	Light	Heavy	Total	Cost(\$)	Trip Time	Distance	Speed	Delay	h						
					(min)	(min)	(km)																(min)	(km)	(min)	(km)	(km/h)	(min)
Complete	6357.6	5491.6	474.4	391.6	15564.6	27077.2	10670.6	24231.6	2002.6	1449.2	0	0	0	0	2624.82	789.96	2624.82	107.234	86.51	1154.04	3.349	8.5635	2.358	17.643	6.113	5.5405	4.9355	4.807
Incomplete	333.8	284.4	25	24.4	336.158	1247	231.91	1091.6	94.8	80.4	2978.96	789.96	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	6691.4	5776	499.4	416	15900.8	28323.8	10902.4	25233.2	2097.4	1529.6	30055.6	11460.6	26856	2109.92	1535.7	13017.2	6.207	12.791	4.038	41.928	7.8895	8.161	7.42	7.0065				
2013 AM	Complete	8954.2	6038.8	531	394.4	16466.4	32293.2	11332.6	28205.6	2234.6	1451.6	0	0	0	0	0	0	0	0	13625.4	1.95	4.613	1.63	21.9775	2.244	2.845	2.5745	2.3155
Incomplete	444.4	392.2	32.6	19.6	373.152	2074.94	257.638	1448	124.6	57.6	5104.36	1041.72	4053.42	138.504	60.662	1829.72	3.9965	11.0425	2.3445	13.9405	8.674	6.385	3.162	2.669	5.4165			
Total	7398.6	6431	563.6	404	16839.6	33368.1	11591.2	29653.8	2359.2	1509.2	37398.2	12374.6	32259.2	2373.14	1512.22	15455.4	5.9465	15.6555	3.9745	35.918	10.918	9.23	9.2045	7.732				
2018 AM	Complete	7586.4	6599	555.4	432	17521.6	37202.6	12086.6	33377.8	2399.2	1488.8	0	0	0	0	0	0	0	0	15404.8	2.0205	4.871	1.593	20.002	2.561	3.152	2.669	2.138
Incomplete	498	450.6	25.8	21.6	408.922	2594.4	283.768	1739.8	97.4	78.4	8278.8	1178.12	5037.88	106.272	79.792	2214.72	4.4035	12.442	2.3635	11.8715	10.1325	6.919	6.362	5.256				
Total	8084.4	7049.6	581.2	453.6	17930.4	39796.4	12370	35117.6	2497.6	1567.2	43486.6	13264.6	38415.8	2496.44	1568.58	17619.2	6.424	17.313	3.9565	31.8735	12.6835	9.971	9.031	7.394				
2028 AM	Complete	8370.2	7345.8	584.8	439.6	18363.2	49263.4	12729.2	50531.6	3329.2	2286.6	0	0	0	0	0	0	0	0	20170.6	2.3915	5.8225	1.522	15.8825	3.628	4.499	3.7165	3.408
Incomplete	717.2	653.8	33.6	29.8	644.4	4636.54	453.004	3464.6	199.2	164.2	10221.8	1633.42	8712	205.62	169.886	3592.54	4.973	14.145	2.2815	11.9495	8.3715	8.9625	8.9625	8.584				
Total	9087.4	7999.6	618.4	469.4	19008	53899.6	13182.4	53996.2	3528.4	2450.8	59465.4	14362.6	59243.6	3534.82	2496.52	23762.8	7.3645	19.9675	3.8035	25.645	15.5775	12.8705	12.679	11.992				

OPTION 1- with addition bridge capacity 4:30PM - 5:30PM																												
Existing	Measured Totals												Estimated Totals						Resultant Derived Averages (per vehicle)									
	All	Cars	Light	Heavy	Freeflow	Trip Time	Distance	Cars	Light	Heavy	Time	Distance	Cars	Light	Heavy	Total	Cost(\$)	Trip Time	Distance	Speed	Delay	h						
					(min)	(min)	(km)																(min)	(km)	(min)	(km)	(km/h)	(min)
Complete	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Incomplete	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2013 AM	Complete	7314.6	6309.2	567.8	437.6	17798.2	20398.2	12217.8	13561.8	1236.6	901.2	0	0	0	0	0	0	0	0	9507.8	1.295	2.7725	1.67	36.328	0.34	1.2725	1.2875	1.2275
Incomplete	418.4	350.2	32.4	35.8	634.66	900.5	419.228	735.2	68	71.8	1897.02	991.64	1232.58	72.23	72.698	832.52	1.9605	4.451	2.3695	32.5065	2.016	2.066	1.963	1.8725				
Total	7733	6659.4	600.2	473.4	18433	21299	12637.2	14297	1304.6	973	22295	13209.4	14795	1308.8	973.9	10340.6	3.2555	7.2235	4.0395	68.8345	2.356	3.3385	3.2505	3.1				
2018 AM	Complete	7947.4	6835.8	627.8	483.8	18766.8	23069.6	12931.8	17154.6	1618	1182	0	0	0	0	0	0	0	0	10770.4	1.355	2.961	1.626	33.797	0.542	1.544	1.5825	1.513
Incomplete	453.6	384.8	42	31.8	685.28	1046.94	455.672	897.4	96.6	71.6	2198.42	1077	1545.52	102.882	72.834	955.28	2.082	4.7275	2.3495	30.227	2.3885	2.313	2.3	2.236				
Total	8406	7220.6	669.8	515.6	19453.8	24116	13387.8	18032	17212.6	1253.6	25268.2	14008.4	18699.8	1718.9	1254.64	11725.6	3.417	7.6285	3.9755	64.024	2.9105	3.857	3.8725	3.749				
2028 AM	Complete	8962.2	7778.8	677	506.4	20148.6	34042	13945.8	28500.8	2271.8	1601.8	0	0	0	0	0	0	0	0	14773.8	1.64	3.771	1.5555	25.005	1.525	2.244	2.135	2.026
Incomplete	673.6	589.6	44.2	39.8	766.38	2612.18	517.68	1861.8	131.4	114	5719.04	1564.76	3961.86	141.726	118.512	2124.5	3.115	8.352	2.3275	17.387	6.1055	4.0785	3.7925	3.576				
Total	9635.8	8368.4	721.2	546.2	20914.8	36654.6	14463.6	30362.6	2403.2	1715.8	39762	15510.8	32462.8	2413.54	1720.3	16898.4	4.735	12.123	3.883	42.392	6.7305	6.4225	5.9275	5.602				

OPTION 2 4:30PM - 5:30PM																												
Existing	Measured Totals												Estimated Totals						Resultant Derived Averages (per vehicle)									
	All	Cars	Light	Heavy	Freeflow	Trip Time	Distance	Cars	Light	Heavy	Time	Distance	Cars	Light	Heavy	Total	Cost(\$)	Trip Time	Distance	Speed	Delay	h						
					(min)	(min)	(km)																(min)	(km)	(min)	(km)	(km/h)	(min)
Complete	6426.2	5540	510.8	375.4	15823.8	28069.8	10913	26515.6	2349.8	1527.6	0	0	0	0	0	0	0	0	0	12429.6	1.925	4.3345	1.7005	24.081	1.87	2.706	2.7175	2.389
Incomplete	359.6	313.8	22	23.8	370.896	1376.08	256.77	1235.4	79	85.4	3241.26	854.58	2951.14	88.658	88.892	1251.5	3.374	6.6185	2.38	17.4165	6.1545	5.4805	5.017	4.9815				
Total	6785.8	5853.8	532.8	399.2	16194.6	29446	11169.6	27751	2428.8	1613	3111	11767.2	29466.8	2438.46	1616.52	13681.4	5.299	12.953	4.0805	41.4975	8.0245	8.2765	7.7345	7.3705				
2013 AM	Complete	8915.8	5896.2	514	405.6	16641.2	32577.6	11554.8	31019	2465.4	1751	0	0	0	0	0	0	0	0	14098.8	2.031	4.677	1.8715	21.8875	2.2715	3.0745	2.8595	2.5925
Incomplete	455.4	401.4	29	25	437.868	2033.32	306.398	1618.8	90.8	81.8	4827.46	1056.98	4113.04	107.486	83.424	1769.46	3.7905	10.243	2.32	14.331	7.8375	6.057	4.483	5.216				
Total	7371.2	6297.6	543	430.6	17078.8	34610.8	11861.2	32630.8	2556.2	1832.8	37405	12611.6	35124.8	2572.88	1834.38	15868	5.8215	14.92	3.9915	36.2785	10.109	9.1315	7.3425	7.0885				
2018 AM	Complete	7142	6194.4	543.8	403.8	16593.6	41282	11557.8	40300.2	3149.6	2012.4	0	0	0	0	0	0	0	0	17113.8	2.4125	5.8315	1.621	17.442	3.5055	4.02	3.619	3.042
Incomplete	655.8	597.8	33.2	24.8	636.79	4564.84	443.344	3244	158	92.8	9372.06	1471.94	7669.34	174.914	93.954	3240.62	4.6955	13.38	2.2485	10.942	11.053	8.06	7.3575	5.993				
Total	7797.8	6792.2	577	428.6	17230.6	46847.4	12001.4	43544.2	3307.6	2105.2	50653.4	13029.2	47969.6	3324.86	2106.32	20354.8	7.108	19.2115	3.8695	26.384	14.5565	12.08	10.9765	9.035				
2028 AM	Complete	1965.4	1696.8	159.4	109.2	4234.224	15148.41	2962.248	14077.8	1151.8	809.2	0	0	0	0	0	0	0	0	5950.314	2.151	5.567	1.115	13.5555	4.009	4.4015	2.9095	3.369
Incomplete	1123	992.6	68.2	62.2	1414.92	38376.6	984.38	7169.8	544.2	495	15923.55	1115.892	7445.652	263.86	193.144	4818.492	4.449	14.608	1.0525	3.584	13.0505	8.3535	9.3325	8.7335				
Total	3088.4	2689.4	227.6	171.4	5648.82	53525.2	3946.9	21247.6	1696	1304.2	31072.36	4078.044	21523.45	1415.6	1002.42	10769.19	6.6	20.175	2.1675	17.1195	17.0595	12.755	12.242	12.1025				

OPTION 2 - with addition bridge capacity 4:30PM - 5:30PM																							
Existing	Measured Totals												Estimated Totals						Resultant Derived Averages (per vehicle)				
	All	Cars	Light	Heavy	Freeflow	Trip Time	Distance	Cars	Light	Heavy	Time	Distance	Cars	Light	Heavy	Total	Cost(\$)	Trip Time	Distance	Speed	Delay	h	
					(min)	(min)</																	

OPTION 2B 4:30PM - 5:30PM																									
	Measured Totals									Estimated Totals									Resultant Derived Averages (per vehicle)						
	All	Cars	Light	Heavy	Freelow Time (min)	Trip Time (min)	Distance (km)	Cars	Light	Heavy	Time (min)	Distance (km)	Cars	Light	Heavy	Total Cost(\$)	Cost(\$)	Trip Time (min)	Distance (km)	Speed (km/h)	Delay (h)	Cars	Light	Heavy	
Existing	Complete	6400.2	5539.6	491.6	369	16213.6	27773.8	10669	26867	2189.2	1475	0	0	0	12308.4	1.914	4.3105	(min)	24.106	1.776	2.835	2.6285	2.344		
	Incomplete	351.2	305.8	20.2	25.2	405.832	1293.936	270.104	1322.6	74.6	89.4	2967.6	825.46	2881.7	80.112	90.714	1171.02	3.236	8.123	2.347	18.2105	5.588	5.559	4.7565	
	Total	6751.4	5845.4	511.8	394.2	16619.6	29067.8	11139	28189.6	2263.8	1564.4	3074.2	11694.6	29748.8	2269.32	1565.7	13479.6	5.15	12.4335	4.047	42.3165	7.364	8.394	7.6665	7.1005
2013 AM	Complete	6924	6007.2	524.6	392.2	17091.8	33082.2	11512.6	31718.6	2499	1657	0	0	0	14231.2	2.051	4.7565	1.664	21.4775	2.2875	3.16	2.8885	2.533		
	Incomplete	444.8	390.6	30	24.2	414.054	2054.94	277.748	1599.6	110	91	4904.72	1044.12	4175.64	125.224	89.68	1798.18	3.9475	10.6855	2.346	14.1085	8.215	6.602	5.5395	6.2655
	Total	7368.8	6397.8	554.6	416.4	17506.2	35136.6	11790.2	33318.2	2609	1748	37986.4	12586.4	35894.4	2624.28	1746.66	16027.6	5.9985	15.442	4.01	35.586	10.5025	9.762	8.428	8.7985
2018 AM	Complete	7521	6556.8	554	410.2	17883.4	40116.4	12110	38405.2	2858.6	1774	0	0	0	16676	2.2025	5.2725	1.607	18.5165	2.898	3.611	3.214	2.624		
	Incomplete	538.2	489.4	28.6	20.2	479.912	3098.32	324.802	2050	116	88.4	7088.4	1243.54	5677.68	128.044	86.524	2479.66	4.6095	13.196	2.311	10.749	10.821	6.9045	6.951	6.6865
	Total	8059.2	7046.2	582.6	430.4	18363.4	43214.6	12434.8	40455.2	2974.6	1862.4	47204.6	13353.4	44082.8	2986.56	1860.52	19155.6	6.812	18.4685	3.918	29.2555	13.719	10.5155	10.165	9.3205
2028 AM	Complete	1422	1224	106.6	91.4	3301.464	9251.868	2216.764	8078.4	715.8	578	0	0	0	0	3733.624	1.8985	5.009	1.208	15.3785	3.199	2.8865	2.7075	2.713	
	Incomplete	1033.8	900	73.4	60.4	1367.96	37774	911.3	6618.4	629.2	371.6	10109.2	785.9	4359.72	255.326	116.954	3074.19	3.0305	9.9205	0.793	3.737	8.1085	8.365	9.92	7.1305
	Total	2455.8	2124	180	151.8	4669.52	47025	3128.34	14696.8	1345	949.6	19361.51	3002.704	12438.12	971.2	694.96	6808.154	4.929	14.9295	2.001	19.1155	11.3075	11.2515	12.6275	9.8435

OPTION 2B - with addition bridge capacity 4:30PM - 5:30PM																									
	Measured Totals									Estimated Totals									Resultant Derived Averages (per vehicle)						
	All	Cars	Light	Heavy	Freelow Time (min)	Trip Time (min)	Distance (km)	Cars	Light	Heavy	Time (min)	Distance (km)	Cars	Light	Heavy	Total Cost(\$)	Cost(\$)	Trip Time (min)	Distance (km)	Speed (km/h)	Delay (h)	Cars	Light	Heavy	
Existing	Complete	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Incomplete	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2013 AM	Complete	7347.6	6347.8	560.4	439.4	18365.2	21848.2	12352.4	17167.8	1521.2	1138.8	0	0	0	10289.4	1.4	2.969	1.6795	34.024	0.472	1.8065	1.626	1.552		
	Incomplete	416.8	356.6	30.2	30	653.7	872.62	422.718	744	62.8	56.2	1839.84	970.88	1305.3	66.384	56.416	811.62	1.944	4.408	2.331	31.8335	1.9105	2.0585	2.1425	1.8095
	Total	7764.4	6704.4	590.6	469.4	19018.8	22720.8	12775.4	17911.8	1584	1195	23687.6	13323.2	18472.6	1589.58	1195.22	11100.6	3.344	7.377	4.0105	65.8575	2.3825	3.665	3.7685	3.3615
2018 AM	Complete	7903.6	6814.2	615.2	474.2	19413.2	27922.8	13101.8	24722.2	2135.2	1573	0	0	0	12771	1.609	3.51	1.66	28.6755	1.0525	2.1705	2.081	1.997		
	Incomplete	535.4	456	41.6	37.8	776.08	1517.06	505.34	1320.2	118.8	96.6	3145.58	1243.18	2426.36	126.286	88.898	1301.56	2.39	5.738	2.325	25.2615	3.28	3.058	2.9975	2.7195
	Total	8439	7270.2	656.8	512	20189.6	29439.4	13607.8	26042.4	2254	1669.6	31068	14345.8	27148.4	2261.54	1671.9	14071.8	3.999	9.248	3.985	53.937	4.3325	5.0785	4.7165	
2028 AM	Complete	432.4	369.4	26.6	26.6	1051.916	2635.26	695.452	1428.2	143	83.4	0	0	0	0	977.588	1.917	5.7015	1.0915	12.4435	4.066	2.6125	1.251	1.082	
	Incomplete	1687.6	1433	132.2	122.4	2485.72	68267.6	1576.76	8093.4	707.8	639	14445.8	959.232	3996.412	186.714	173.88	4168.044	2.4995	8.6565	0.577	7.255	7.023	6.0555	5.762	5.5485
	Total	2120	1802.4	168.6	149	3537.58	70902.8	2272.22	9521.6	850.8	722.4	17080.96	1654.62	5424.44	329.716	257.28	5145.25	4.4165	14.358	1.6685	15.169	11.089	8.668	7.013	6.6305

OPTION 3 4:30PM - 5:30PM																									
	Measured Totals									Estimated Totals									Resultant Derived Averages (per vehicle)						
	All	Cars	Light	Heavy	Freelow Time (min)	Trip Time (min)	Distance (km)	Cars	Light	Heavy	Time (min)	Distance (km)	Cars	Light	Heavy	Total Cost(\$)	Cost(\$)	Trip Time (min)	Distance (km)	Speed (km/h)	Delay (h)	Cars	Light	Heavy	
Existing	Complete	8810.4	5916.4	508	385	16668.4	31425.6	11390.6	29171.6	2345.8	1629.2	0	0	0	13960.6	2.0095	4.6355	1.683	23.661	2.1895	2.9225	2.7275	2.545		
	Incomplete	435.2	376.8	29.4	29	407.092	1952.074	284.15	1457.6	115.4	101.4	4636.22	1043.64	3665.68	62.374	106.238	1702.74	3.7485	10.098	2.393	16.6725	7.6335	5.816	5.877	5.04
	Total	7245.6	6293.2	537.4	415	17075.6	33378	11674.4	30629.2	2461.2	1730.6	36001.6	12433.8	32837.2	2469.22	1735.48	15283.8	6.758	14.7515	4.076	40.3335	9.823	8.7385	8.6045	7.585
2013 AM	Complete	7369.8	6415.6	552.8	401.2	17430	35856.2	11966	36546.8	2908.8	1855	0	0	0	15512.8	2.11	4.8725	1.632	22.237	2.4965	3.451	3.269	2.879		
	Incomplete	488.6	434.2	30.8	23.6	435.412	2323.3	306.066	1854.4	159.8	102.2	5470.74	1167.88	4656.08	174.778	99.664	2012.88	3.997	10.8105	2.395	15.3755	8.434	6.678	8.268	6.6
	Total	7858.2	6849.8	583.6	424.8	17865.8	38180.2	12272.2	38401.2	3068.6	1957.2	41326.6	13134.6	41202.8	3083.48	1954.7	17525.8	6.107	17.583	4.027	37.6325	10.3905	10.129	11.637	9.479
2018 AM	Complete	7293.6	6362.8	524.2	406.6	16681.18	36089.2	11488.52	38770.2	2910	1933.6	0	0	0	15626.14	2.181	5.0605	1.602	20.881	2.725	3.8015	3.5425	3.058		
	Incomplete	580	528.4	28.6	23	547.244	4635.98	383.666	2671.2	136	117.8	6764.66	1247	5653.14	128.978	115.074	2409.86	4.066	11.2105	2.234	13.53	8.873	7.473	7.4995	7.2415
	Total	7873.6	6891.2	552.8	429.6	17228.4	40725	11872.46	41441.4	3046	2051.4	42894.6	12735.86	44423.4	9038.912	2046.68	18035.4	6.247	16.271	3.936	34.411	11.398	11.2745	11.042	10.2965
2028 AM	Complete	5525.6	4807	422	296.6	12447.84	27689.44	8565	29443.4	2383.4	1533.2	0	0	0	11966.12	2.318	4.5355	1.681	19.865	2.9525	3.746	3.391	3.412		
	Incomplete	801.2	734	35.2	32	928.588	12427.88	635.368	4533.8	233	176	9744.88	1324.74	6638.672	161.82	118.736	3237.47	4.0025	11.732	1.788	9.7955	9.25	7.9385	9.007	7.49
	Total	6326.8	5541	457.2	328.6	13376.44	40117	9200.5	33977.2	2616.4	1709.2	37434.94	9889.72	36082.16	2545.38	1851.928	15203.52	6.3205	17.1675	3.469	29.6605	12.2025	11.6845	12.398	10.902

OPTION 3 - with addition bridge capacity 4:30PM - 5:30PM																									
	Measured Totals									Estimated Totals									Resultant Derived Averages (per vehicle)						
	All	Cars	Light	Heavy	Freelow Time (min)	Trip Time (min)	Distance (km)	Cars	Light	Heavy	Time (min)	Distance (km)	Cars	Light	Heavy	Total Cost(\$)	Cost(\$)	Trip Time (min)	Distance (km)	Speed (km/h)	Delay (h)	Cars	Light	Heavy	
Existing	Complete	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	Incomplete	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2013 AM	Complete	7767.2	6724	584.2	459	19040	28787.4	13017.2	21764.4	1855.8	1313.4	0	0	0	12608.2	1.633	3.7365	1.8835	28.3295	1.275	1.912	1.8795	1.7295		
	Incomplete	559.6	478.4	45.2	36	723	1804.96	483.1	1397.4	123.2	94.8	3921.94	1336.78	2583.64	131.386	94.988	1525.86	2.6725	6.87	2.39	23.9745	24.3755	3.308	3.152	3.1895
	Total	8326.8	7202.4	629.4	495	19763	30592	13500.6	23161.8	1979	1408.2	32709.6	14353.6	24347.8	1987.24	1408.44	14134.2	4.3055	10.5735	4.0735	51.204	5.6505	5.22	5.0315	4.919
2018 AM	Complete	6289.2	5455.2	480	354	14898.52	23617.6	10201.1	18961.6	1635	1085.8	0	0	0	10330.08	1.725	4.0075	1.6615	26.6075	1.5605	2.13	2.113	1.903		
	Incomplete	878.6	745.6	72	61.8	1288.68	9628.9	839.838	3094	302.4	217.2	8918.06	1690.82	4066.1	240.968	170.93	2996.3	3.11							

Appendix G

Options Testing - Queue Length Summary

appendix

South Grafton Traffic Study - Queue Summary Gwydir Hwy / Bent Street

Options	95% Queue AM Peak (PM Peak)				
	Approach	2007	2013	2018	2028
Existing	Gwydir Hwy E App	16 (8)	32 (33)	33 (32)	32 (0)
	Gwydir Hwy W App	25 (5)	52 (12)	54 (21)	53 (51)
	Bent Street S App	11 (6)	11 (7)	11 (9)	12 (8)
	Bent Street N App	2 (6)	45 (44)	42 (46)	45 (16)
Ex+b	Gwydir Hwy E App		31 (21)	27 (32)	31 (34)
	Gwydir Hwy W App		15 (15)	22 (34)	52 (54)
	Bent Street S App		4 (4)	9 (6)	7 (12)
	Bent Street N App		9 (6)	45 (44)	45 (44)
Option 1	Gwydir Hwy E App	3 (3)	4 (4)	4 (5)	6 (31)
	Gwydir Hwy W App	48 (3)	53 (10)	53 (8)	54 (44)
	Bent Street S App	11 (5)	11 (6)	11 (8)	12 (11)
	Bent Street N App	3 (4)	2 (5)	3 (9)	5 (43)
Option 1+b	Gwydir Hwy E App		3 (3)	3 (7)	3 (24)
	Gwydir Hwy W App		13 (10)	22 (9)	30 (28)
	Bent Street S App		10 (10)	10 (10)	11 (11)
	Bent Street N App		4 (9)	3 (12)	3 (12)
Option 2	Gwydir Hwy E App	4 (4)	6 (5)	4 (31)	33 (3)
	Gwydir Hwy W App	15 (5)	52 (9)	52 (12)	54 (52)
	Bent Street S App	10 (5)	12 (10)	12 (10)	10 (2)
	Bent Street N App	4 (6)	5 (8)	4 (22)	46 (43)
Option 2+b	Gwydir Hwy E App		4 (13)	4 (31)	1 (0)
	Gwydir Hwy W App		11 (9)	35 (19)	53 (50)
	Bent Street S App		10 (7)	11 (9)	10 (9)
	Bent Street N App		4 (15)	7 (45)	48 (45)
Option 2B	Gwydir Hwy E App	4 (4)	3 (7)	11 (14)	0 (2)
	Gwydir Hwy W App	43 (3)	52 (4)	54 (13)	52 (51)
	Bent Street S App	10 (5)	11 (5)	12 (6)	7 (3)
	Bent Street N App	3 (5)	3 (5)	5 (7)	11 (10)
Option 2B+b	Gwydir Hwy E App		3 (4)	4 (13)	3 (9)
	Gwydir Hwy W App		20 (4)	10 (5)	50 (50)
	Bent Street S App		8 (5)	10 (7)	10 (10)
	Bent Street N App		3 (7)	5 (8)	11 (11)

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Option 3	Gwydir Hwy E App	3 (4)	3 (14)	13 (15)	4 (15)
	Gwydir Hwy W App	53 (7)	54 (42)	55 (47)	54 (52)
	Bent Street S App	11 (11)	11 (10)	12 (11)	12 (9)
	Bent Street N App	4 (6)	5 (6)	3 (11)	3 (43)
Option 3+b	Gwydir Hwy E App		6 (13)	3 (14)	3 (15)
	Gwydir Hwy W App		48 (38)	53 (53)	53 (51)
	Bent Street S App		11 (10)	12 (10)	12 (11)
	Bent Street N App		2 (11)	5 (47)	4 (45)

AM Peak: 8:30-9:30

PM Peak: 16:30-17:30

appendix

South Grafton Traffic Study - Queue Summary Through St / Bent Street

Options	95% Queue AM Peak (PM Peak)				
	Approach	2007	2013	2018	2028
Existing	Gwydir Hwy E App	5 (3)	4 (9)	3 (30)	28 (19)
	Gwydir Hwy W App	54 (2)	57 (3)	56 (10)	56 (45)
	Bent Street S App	57 (5)	58 (4)	59 (5)	60 (58)
	Bent Street N App	2 (2)	21 (7)	20 (42)	43 (41)
Ex+b	Gwydir Hwy E App		4 (4)	9 (25)	35 (13)
	Gwydir Hwy W App		7 (4)	8 (6)	13 (13)
	Bent Street S App		7 (4)	5 (4)	7 (60)
	Bent Street N App		2 (4)	20 (26)	48 (46)
Option 1	Gwydir Hwy E App	3 (3)	3 (6)	3 (4)	3 (12)
	Gwydir Hwy W App	46 (3)	56 (3)	56 (11)	55 (8)
	Bent Street S App	58 (4)	58 (6)	60 (5)	59 (25)
	Bent Street N App	2 (3)	2 (2)	2 (3)	2 (21)
Option 1+b	Gwydir Hwy E App		5 (5)	3 (7)	3 (9)
	Gwydir Hwy W App		3 (3)	6 (4)	42 (6)
	Bent Street S App		10 (5)	8 (5)	7 (7)
	Bent Street N App		4 (6)	3 (4)	3 (7)
Option 2	Gwydir Hwy E App	3 (10)	2 (5)	5 (8)	11 (19)
	Gwydir Hwy W App	52 (3)	57 (5)	58 (9)	45 (44)
	Bent Street S App	58 (4)	61 (4)	60 (6)	21 (24)
	Bent Street N App	2 (2)	2 (2)	2 (3)	44 (42)
Option 2+b	Gwydir Hwy E App		4 (4)	3 (14)	12 (3)
	Gwydir Hwy W App		3 (4)	6 (12)	44 (40)
	Bent Street S App		6 (4)	7 (7)	20 (13)
	Bent Street N App		2 (3)	2 (49)	50 (49)
Option 2B	Gwydir Hwy E App	2 (2)	2 (2)	2 (1)	2 (2)
	Gwydir Hwy W App	54 (2)	56 (4)	58 (9)	56 (45)
	Bent Street S App	47 (4)	51 (5)	48 (7)	32 (6)
	Bent Street N App	2 (2)	2 (3)	2 (3)	41 (45)
Option 2B+b	Gwydir Hwy E App		2 (2)	2 (2)	2 (2)
	Gwydir Hwy W App		8 (2)	5 (12)	40 (44)
	Bent Street S App		6 (5)	9 (4)	7 (2)
	Bent Street N App		2 (4)	2 (4)	49 (49)

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Option 3	Gwydir Hwy E App	2 (3)	5 (7)	5 (5)	2 (4)
	Gwydir Hwy W App	52 (2)	57 (4)	56 (8)	56 (41)
	Bent Street S App	61 (6)	58 (4)	56 (7)	58 (32)
	Bent Street N App	2 (2)	3 (2)	2 (4)	4 (47)
Option 3+b	Gwydir Hwy E App		2 (5)	2 (24)	3 (7)
	Gwydir Hwy W App		9 (4)	12 (38)	25 (40)
	Bent Street S App		8 (4)	9 (6)	4 (29)
	Bent Street N App		2 (3)	3 (49)	3 (49)

AM Peak: 8:30-9:30

PM Peak: 16:30-17:30

appendix

South Grafton Traffic Study - Queue Summary Pacific Highway/Gwydir Highway

Options	95% Queue AM Peak (PM Peak)				
	Approach	2007	2013	2018	2028
Existing	Gwydir Highway W App	8 (3)	35 (32)	34 (36)	34 (21)
	Pacific Highway S App Slip Lane	1 (0)	9 (14)	18 (25)	12 (2)
	Pacific Highway N App RT	2 (0)	25 (22)	27 (24)	23 (6)
Ex+b	Gwydir Highway W App		33 (3)	34 (34)	35 (32)
	Pacific Highway S App Slip Lane		5 (7)	14 (19)	22 (21)
	Pacific Highway N App RT		10 (1)	6 (11)	16 (24)
Option 1	Gwydir Highway W App	2 (2)	3 (3)	3 (4)	3 (29)
	Pacific Highway S App Slip Lane	0 (0)	0 (0)	0 (0)	0 (31)
	Pacific Highway N App RT	2 (0)	1 (1)	1 (2)	2 (25)
Option 1+b	Gwydir Highway W App		3 (3)	2 (3)	16 (7)
	Pacific Highway S App Slip Lane		0 (0)	0 (0)	0 (23)
	Pacific Highway N App RT		1 (1)	0 (2)	2 (4)
Option 2	Gwydir Highway W App	3 (4)	4 (3)	14 (28)	26 (23)
	Pacific Highway S App Slip Lane	0 (0)	0 (0)	0 (10)	15 (5)
	Pacific Highway N App RT	6 (3)	12 (7)	12 (20)	26 (21)
Option 2+b	Gwydir Highway W App		3 (25)	8 (31)	34 (34)
	Pacific Highway S App Slip Lane		0 (0)	0 (8)	6 (6)
	Pacific Highway N App RT		9 (8)	11 (21)	25 (10)
Option 2B	Gwydir Highway W App	3 (5)	3 (5)	4 (8)	31 (30)
	Pacific Highway S App Slip Lane	0 (0)	0 (0)	0 (3)	4 (7)
	Pacific Highway N App RT	9 (5)	9 (7)	7 (8)	22 (21)
Option 2B+b	Gwydir Highway W App		5 (7)	4 (9)	27 (27)
	Pacific Highway S App Slip Lane		0 (0)	0 (1)	7 (0)
	Pacific Highway N App RT		7 (6)	8 (10)	13 (22)

AM Peak: 8:30-9:30

PM Peak: 16:30-17:30

South Grafton Traffic Study - Queue Summary The big about

Options	95% Queue AM Peak (PM Peak)				
	Approach	2007	2013	2018	2028
Option 3	Gwydir Hwy W App	1 (2)	0 (2)	0 (3)	1 (3)
	Iolanthe St N App	2 (1)	7 (2)	7 (3)	6 (11)
	Pacific Hwy NE App	0 (0)	32 (0)	31 (1)	30 (35)
	Pacific Hwy SE App	3 (1)	30 (3)	30 (6)	31 (32)
	Armidale St S App	3 (2)	5 (2)	11 (4)	6 (13)
Option 3+b	Gwydir Hwy W App		1 (2)	5 (2)	2 (5)
	Iolanthe St N App		0 (4)	6 (10)	2 (10)
	Pacific Hwy NE App		14 (0)	27 (32)	20 (35)
	Pacific Hwy SE App		23 (3)	31 (29)	30 (27)
	Armidale St S App		6 (2)	8 (12)	12 (15)

AM Peak: 8:30-9:30

PM Peak: 16:30-17:30