MWH

BUILDING A BETTER WORLD

REPORT

Motueka Transportation Study

Prepared for Tasman District Council

DECEMBER 2009

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NZ TRANSPORT AGENCY AND TASMAN DISTRICT COUNCIL

Motueka Transportation Study

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1 Introduction

1.1 Background

Motueka is a township located in the Tasman Bay area, close to the coastline, with a population of approximately 6,400 people.

The town length is approximately 4km with a mixture of residential and commercial development on either side of State Highway 60 (SH60). The town centre is between Whakarewa Street and Pah Street. As there are few other north-south links through Motueka, SH60 becomes congested during peak periods of the day, and this is exacerbated during the summer holiday period as SH60 provides the main access to Golden Bay and Abel Tasman National Park.

There is substantial growth being planned for Motueka, particularly the Wahanga Limited development located to the west of SH60. These developments, and the resultant increase in vehicle flows, parking demand and pedestrian numbers, will place additional pressure onto the transportation network.

Figure 1-1 shows the study area.

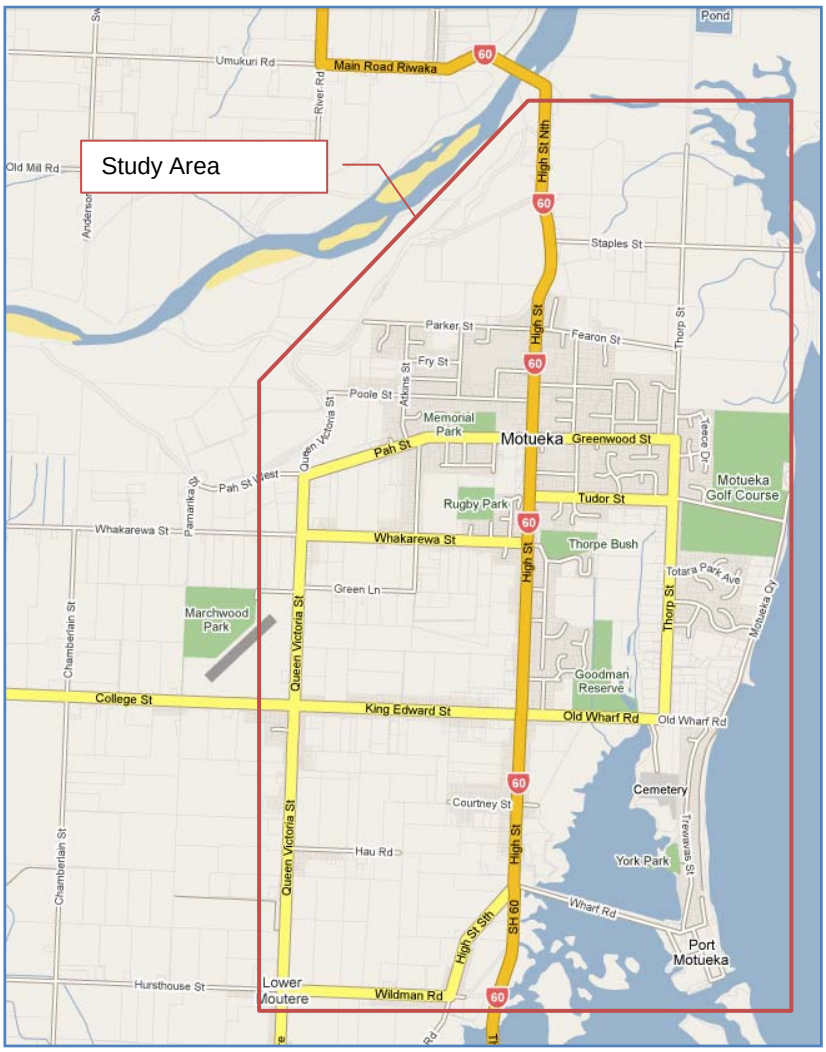

Figure 1-1: Study Area

1.2 Investigation Scope

NZ Transport Agency and Tasman District Council have engaged MWH New Zealand to investigate options for improving the north-south connectivity through Motueka so that the safety and efficiency of movements along SH60 High Street is improved, particularly in the town centre for pedestrians.

The scope of the study includes investigation of alternative routes through Motueka and improvements in provision and safety for pedestrians within the Town Centre to assist in creating a pleasant shopping precinct.

The investigation scope is to produce a Final Study Report that:

- Reviews previous reports undertaken within Motueka with respect to bypasses and alternative routes.
- Assesses the existing network operation and identifies operational and safety issues with current routes.
- Identifies alternatives for provision of vehicle movements on SH60 through Motueka, including consideration of heavy traffic, and alternative routes, and improvements to vehicle and pedestrian movements on SH60 within the town centre.
- Develops a strategy that meets the immediate needs and future long term needs of Motueka, specifically allowing for future developments.
- Provides conclusions from the study and recommends an action plan.

Due to the current legislative and funding environment, a full bypass of Motueka including a new bridge over the Motueka River is not likely to be progressed within the next 10 to 20 years. Accordingly, consideration of such an option is specifically excluded from the scope of this study, which instead focuses on the short to medium term improvements which can be undertaken before such a bypass is constructed.

1.3 Report Layout

This report is divided into the following sections:

- Section 2 describes the existing network, including traffic volumes and crash history.
- Section 3 notes proposed developments that could affect this study.
- Section 4 notes key observations from the team site visit in July 09.
- Section 5 identifies the potential options.
- Section 6 summaries the traffic modelling.
- Section 7 summarises costs.
- Section 8 provides conclusions and recommendations.

2 Previous Reports

There have been a number of transport studies undertaken within the study area dating back to the early 1990s. A review of earlier reports has been undertaken to identify what was previously identified as key concerns and the associated options and proposals to mitigate or address these concerns.

The majority of relevant reports focused on the provision of a bypass of Motueka, although other reports looked at rural curves, car parking, flood control and land use. This section provides a summary of the previous reports relating to north-south connectivity and SH60 High Street. All reports are individually summarised in Appendix A.

2.1 Summary of Previous Reports

The Motueka River Bridge (north of Motueka) was identified as being structurally unsound in 1991, with a theoretical strength of 60% Class 1. At the same time, congestion within the Motueka township was deemed to be at an unacceptable level, with measured traffic speeds of 25km/h during peak times. The option of creating a new bridge and an associated central business district bypass was explored in several reports from 1991-1994. The options considered in the previous reports are summarised below.

Upgrading of High Street to alleviate congestion

Initial consideration was given to providing four lanes, however this was discounted due to the narrow road corridor width. Accordingly a plan was developed that focussed on intersection improvements and parking management. Key points included:

- Strict enforcement to remove double parked heavy vehicles which are seen to increase congestion.
- Limiting hours of commercial trucks loading/unloading.
- Provision of more P10 loading bays.
- Traffic signals at the SH60/Pah Street/Greenwood Street intersection
- Pedestrian crossing facilities at the SH60/Tudor Street intersection
- Developing service lanes at the rear of the commercial area (including connecting Talbot Street and Manoy Street to provide an additional connection)
- Develop parking areas/buildings to relieve parking demand on High Street.

During the scheme assessment process this option was dropped because it was not deemed economically and socially beneficial in the long term. Major concerns included the continued severance of the town centre, the retention of the poor bridge position and alignment and the number of intersections, and hence congestion and conflict points was not reduced.

Eastern Bypass

An eastern bypass was considered using Thorp Street and a new Motueka River Bridge to the east of the existing bridge. This was discarded due to the residential development in the east and the environmentally sensitive estuary that would require crossing.

Queen Victoria Street Bypass

This option was identified as early as 1983 and provided a bypass of Motueka town centre along Queen Victoria Street and a new longer bridge across the Motueka River. This was considered a good option at the time. It was noted in the reports there is ribbon residential development along this route and that it is used as a pedestrian and cyclist route by school children.

The reports noted that Queen Victoria Street was previously a State Highway so the pavement is highly likely to be suitable for higher traffic volumes. Issues with the route included severance to any further development in the west, retention of the poor alignment north of the river through Riwaka and that the route would still have a mix of local traffic as it is close to the town centre.

Chamberlain Street Bypass

A bypass option using Chamberlain Street was developed to mitigate some of the concerns of the Queen Victoria Street route. It involves a new bypass of the town centre and a new bridge over the Motukea River. This was deemed to be the preferred option by the scheme assessment report undertaken in 1994 as there would be no increase in the total distance for State Highway traffic, less disruption of residential areas (though some farm buildings would be destroyed), less severance and it would improve the alignment past Riwaka. It would also have a higher design speed and the new Motueka River bridge would be shorter compared to other options. However, it would be the most expensive option and would require large flood protection works.

In the mid-1990's the then Transit New Zealand upgraded the exiting bridge to full Class 1 loading. Subsequent updating of the economics for the western bypass options in 1997 indentified that the BCR dropped significantly and the project was not fundable in the short to medium term.

Heavy vehicle bypass

Brief mention was made of the possibility of providing a heavy vehicle bypass of the town centre via Thorp Street or Queen Victoria Street, however no detailed analysis was undertaken. These options were discarded after a full bypass to the west of the town centre was determined to be the preferred option.

3 Existing Situation

3.1 Road Hierarchy

Figure 2.2 shows the road hierarchy in Motueka. The arterial routes are in red, distributors in green, collectors in yellow, access road in purple and access place in blue. Note that there are two north-south arterial routes, being High Street (SH 60) and Queen Victoria Street up to its intersection with Poole Street.

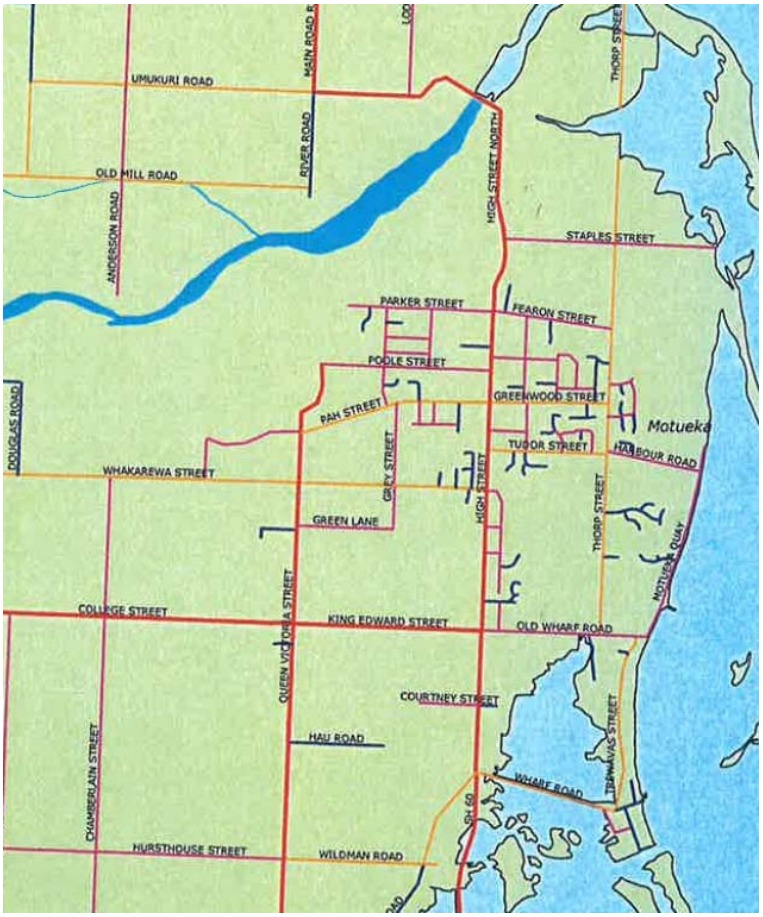

Figure 3-1: Motueka Road hierarchy

3.2 Traffic Data Collection

Historic traffic data has been collected from NZTA and Tasman District Council for the key routes within the study area. In addition to this, intersection turning counts, updated tube counts and a license plate survey have recently been completed. The following sections summarises the available data.

3.2.1 Classified Tube Counts

Traffic counts were obtained from Tasman District Council and the NZTA for local roads and state highway respectively.

Table 3-1 provides a summary of AADT volumes on roads within the study area, including the continuous count site in Riwaka.

Table 3-1: ADTs within Study Area

Road	Location	Date	% HV	ADT
SH 60 - High Street	South of Old Wharf Road	July 2009	4.1	8,171
SH 60 - Shell Garage	RS33, RP6.650	2008 AADT	7.0	13,283
SH 60 - Riwaka	RS33, RP1.163	2008 AADT	7.9	3,808
Wharf Road	East of SH 60	February 2007	6.9	1,342
College Street	West of Queen Victoria St	June 2009	4.4	1,458
King Edward Street	East of Queen Victoria St	July 2009	5.6	3,657
Old Wharf Road	East of SH 60	September 2008		2,390
Queen Victoria Street	North of Hursthouse Street	August 2009	3.7	2,572
	North of King Edward Street	August 2005		2,195
	South of Green Lane	March 2009		2,605
	South of Whakarewa Street	February 2008		2,434
Whakarewa Street	West of SH 60	February 2009	15.5	2,647
	East of Queen Victoria St	July 2009		1,514
Harbour Road	West of Motueka Quay	September 2006	1.6	675
Motueka Quay	North of Old Wharf Road	September 2006	3.0	399
Trewavas Street	South of Old Wharf Road	February 2009	3.3	1,074
Fearon Street	East of SH 60	June 2009		1,042
Greenwood Street	East of SH 60	June 2009		2,151
	Pethybridge Street	August 2008		1,092
Pah Street	West of SH 60	February 2008		2,818
	Atkins Street	February 2008		1,508
Parker Street	West of SH 60	August 2009		901
Poole Street	West of SH 60	August 2009		1,343
	Atkins Street	August 2007		253
Thorp Street	North of Old Wharf Road	September 2008		2,086
	North of Totara Park Avenue	September 2008		1,980
	South of Greenwood Street	September 2003		922
	Pethybridge Street	August 2006		634
	South of Fearon Street	June 2009		625
	South of Staples Street	August 2008		121
Tudor Street	East of SH 60	October 2008		3,752
Wildman Road	East of Main Road	August 2009		1,393
Staples Street	East of SH 60	August 2006		484

Figure 3-2 shows the Riwaka Telemetry Site data indicating the peak traffic volumes along SH60 occur in the months of December to February, with a prominent peak in the weeks immediately before and after New Year's Day. The ADT ranges from 11,000 vpd in January to 2,200 in June and July.

Figure 3-3 shows the Motueka High Street tube count data, from the site near the Shell Garage, and indicates a higher traffic volume in February. The ADT ranges from 17,000 vpd in February to 10,000 vpd in August.

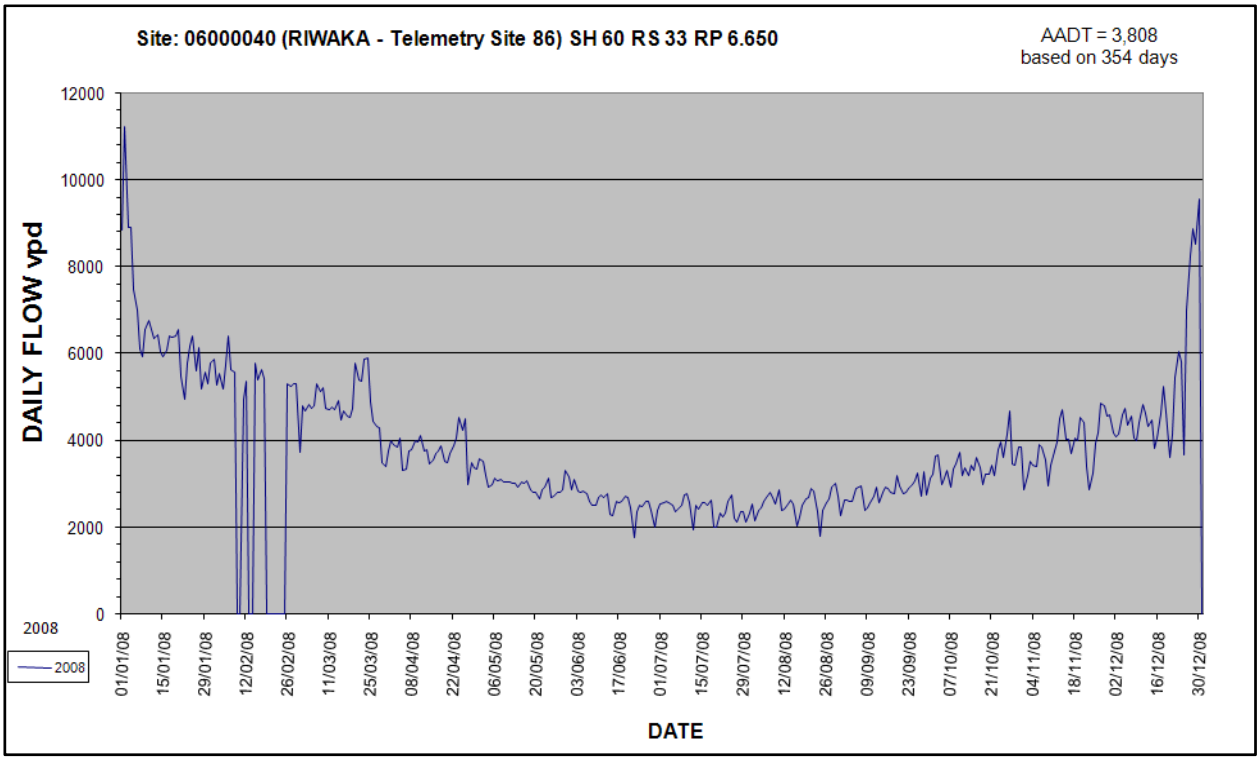

Figure 3-2: Riwaka Telemetry Site

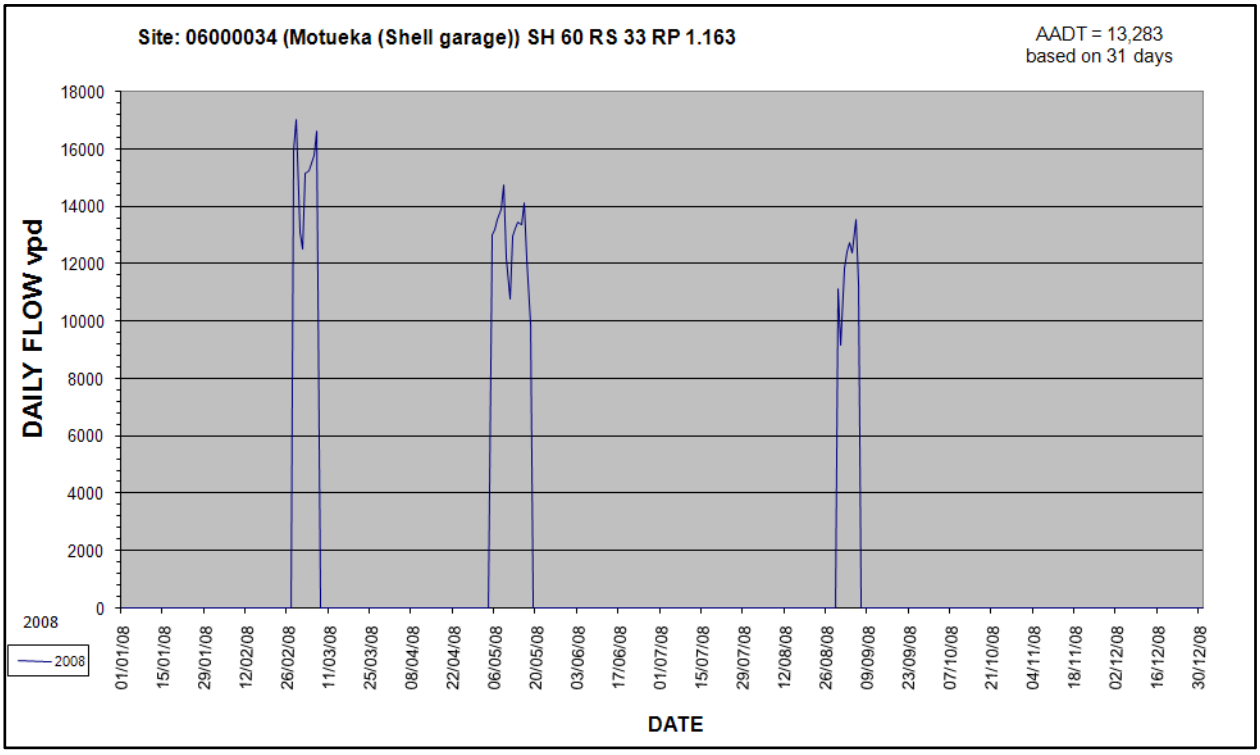

Figure 3-3: Motueka Count Site (near Shell Garage)

There is currently no recorded traffic count data for SH60 within Motueka for the peak December/January period and none was able to be undertaken as part of this study due to the timing of the contract period.

Nevertheless, the likely increase in through traffic on SH60 during this summer peak can be determined from the Riwaka telemetry site and adjustments made to the Motueka AADT to account for this peak. This process is explained further in the traffic modelling section of this report (see Section 8).

3.2.2 Intersection Turning Surveys

To allow analysis of key intersections using the traffic modelling package SIDRA, intersection turning movement surveys have been undertaken for the morning and evening peak periods.

From the NZTA tube count data on High Street (at RS 33, RP 1.163, near the Shell Station at No.250 for May 08 and March 09) the peak one-hour periods were evaluated to be:

- Morning Peak, 8.30-9.30am
- Evening Peak, 4.30-5.30pm

From the tube count data it was noted that the midday peak (12-2pm) has similar traffic volumes to the morning peak period, with the peak flows being directional, 12-1pm southbound higher (decreasing RP) then 1-2pm northbound higher (increasing RP).

The key intersections identified by the steering group for survey were:

1. SH60 / King Edward Street
2. SH60 / Whakarewa Street
3. SH60 / Pah Street
4. SH60 / Parker Street / Fearon Street
5. SH60 / Tudor Street –including the pedestrian crossing north of Tudor Street on SH60.
6. King Edward Street / Queen Victoria Street

The turning count surveys included pedestrian and cyclist movements. The raw data from these traffic surveys is available on request.

3.2.3 License Plate Survey

A license plate survey was undertaken on 1 July 2009 to identify the proportion of heavy vehicles that were passing directly through Motueka and, where possible, the route taken. Again, due to the contract period, this survey was undertaken during winter rather than during the peak summer period.

The survey was over two hours from 12pm to 2pm with surveyors located at the following sites:

- The southern station on SH 60 north of the Wharf Road intersection. This location was selected for lower vehicle speeds entering and exiting the roundabout and to identify through traffic from the Richmond area.
- The northern station on SH 60 located immediately north of the Staples Street intersection. This location was chosen to identify any heavy vehicles that might be using Staples Street as an alternative route to SH60 to avoid the town centre.
- Western station at the Queen Victoria Street intersection with King Edward Street. The respective streets were surveyed south and west of the intersection to identify traffic using the Moutere Highway and the Motueka Valley Highway.
- An intermediate station was located on SH60 at the Tudor Street intersection. This surveyed heavy vehicles only and was to identify any vehicles using alternative routes through Motueka.

It was considered that surveying during the morning or evening peak periods could identify a higher number of through vehicles than would be expected during the remainder of the day, hence the survey was over the midday period.

Figure 3-4 shows the license plate survey sites, and the identification numbers that were assigned to each direction of travel for analysis and reporting. For example, the High Street northbound movement passes through count sites with Id-1 and Id-7, and where this movement passed through the Tudor Street station Id-a is added. It should be noted that the Tudor Street station (Id-a and Id-b) took account of heavy vehicles only.

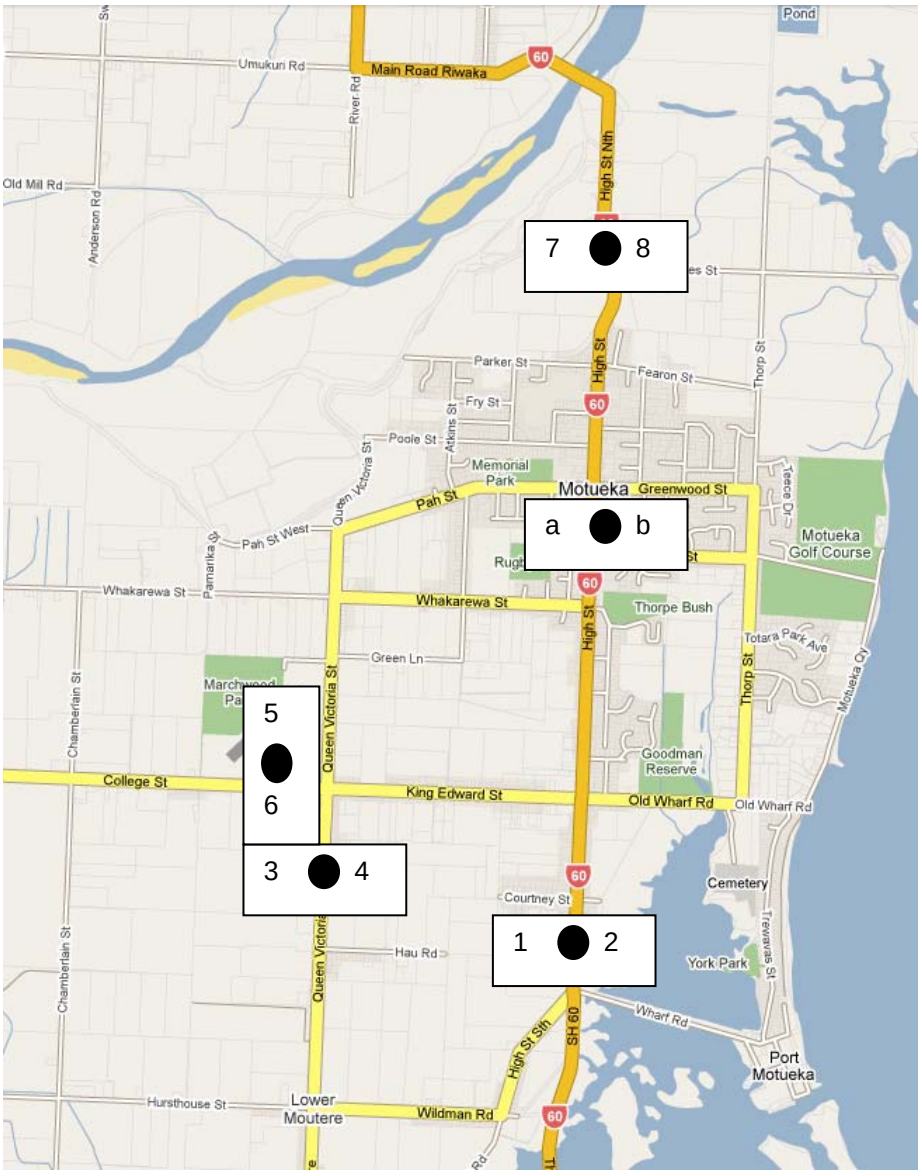

Figure 3-4: License Plate Survey Sites and ID

3.2.3.1 Survey Results

Analysis of the license plate survey has helped to identify the routes used by heavy vehicles. Also reviewed was the north-south travel time, and from this inference of whether heavy vehicles have a destination within Motueka Town Centre or are passing directly through.

The analysis has been split into two portions:

- Matching of license plates from the counts sites. This identified where vehicles entered and exited, and where there was no exit recorded it has been assumed the vehicle has reached its destination within Motueka.

For the vehicles where entry and exit are recorded, the split of heavy vehicles was identified and the average travel times evaluated.

Table 3-2 summarises the raw data collected from the license plate survey for vehicles entering Motueka.

Table 3-2: License Plate Survey Results

Site	ID	No. of Vehicles Surveyed	No. of Vehicles Matched	% of Vehicles Matched
High Street south - northbound	1	528	330	63%
High Street south - southbound	2	555	343	62%
High Street north - northbound	7	409	409	100%
High Street north - southbound	8	359	252	70%
Queen Victoria Street	3-4	419	309	74%
College Street	5-6	243	207	85%
Total		**2,513**	**1,850**	

The percentage of vehicles matched reflects the vehicles that have been tracked through the count sites. Vehicles that have not been matched fall into three categories:

1. Vehicles that have used a route not surveyed, such as Chamberlain Street or Wharf Road.
2. Vehicles that have Motueka as a destination, or left from the Motueka town centre and not returned during the survey period.
3. License plates were recorded incorrectly, and through the data review could not be linked.

It is not possible to identify what proportion of vehicles fall into each category, however from back analysis there are potentially up to 663 vehicles (or 26%) that had Motueka as an origin or destination during the survey period.

For the vehicles where an entry and exit was recorded, Table 3-3 summaries the routes taken, number of vehicles and heavy vehicles and the average journey time for vehicles and heavy vehicles.

The survey has revealed that 34% of trucks use the High Street route from north to south or vice versa, and 21% of trucks use the Queen Victoria Street or King Edward Street to High Street north or south route. The percentage of heavy vehicles entering and leaving from either the north or south, i.e. they have a destination within Motueka, is 20% to 35% respectively.

For northbound trucks (route 1-7) eight of the nine recorded travelled through the High Street count station (station a) north of Tudor Street. For southbound trucks (route 8-2) sixteen of the seventeen recorded travelled through the High Street count station (station b) north of Tudor Street. The trucks that did not pass through station a or b are likely to be servicing businesses rather than using alternative routes.

The survey sites did not enable identification of vehicles that could be using Queen Victoria Street as an alternative through route.

Table 3-3: License Plate Survey Routes Used

Route	ID	No. of Cars	No. of Trucks	Total	Avg Time cars (mins)	Avg Time HV (mins)
Northbound						
High St northbound	1-7	74	9	83	5.4	5.7
High south to Queen Vic St	1-4	12	0	12	31.7	-
High south to College St	1-6	11	2	13	29.3	15.5
Queen Vic to High St	3-7	52	3	55	32.2	45.0
College to High St	5-7	31	2	33	42.0	43.5
High St south enter and exit	8-7	42	8	50	37.4	33.6
Southbound						
High St southbound	8-2	84	17	101	5.4	5.2
High north to Queen Vic	8-4	5	0	5	38.9	-
High north to College	8-6	7	1	7	35.0	-
Queen Vic to High St	3-2	19	3	22	35.5	34.3
College to High St	5-2	14	1	15	21.9	17.5
High St north enter and exit	1-2	75	7	82	35.0	41.0

It was noted that neither of the eastern alternative north-south routes, being either Thorp Street or Vosper Street, were used by heavy vehicles during the survey. This survey was undertaken during a time of low congestion on High Street, therefore it is unknown whether a significant amount of heavy vehicles use these alternative routes at other times.

The survey did show that a number of vehicles approaching from the west use College Street and Queen Victoria Street for destinations north of Motueka.

In terms of journey time, the results show the majority of vehicles and heavy vehicles that are north-south or south-north bound are not stopping in Motueka but passing directly through.

3.3 Main Street Comparison with other Towns

Some brief investigations were undertaken to compare the highway through Motueka with other towns of a similar size. The comparison included determining those towns which have a population between 5,000 and 10,000 people, and outlining the form of the main street through the town centre where this is also the State Highway.

A list of the towns investigated and their characteristics is shown in Table 3-4 below.

In summary, of the 21 towns with a population of between 5,000 and 10,000, six others have their main street also acting as the state highway. Of these six, only two others have a similar road cross-section to Motueka, being a narrow street with parallel parking; the four others have a much wider cross section with a raised, often planted, median and angle parking.

The two towns which are in a similar situation to Motueka are Otaki and Dannevirke. A full bypass of Otaki has recently been consulted upon by the NZ Transport Agency as part of it place in the Levin to Wellington Road of National Significance and Dannevirke currently has a heavy vehicle bypass signposted to the west of the town centre.

There are other towns around New Zealand with slightly different populations which may also be in a similar position to Motueka in regards to the dual use of the main street. Further investigation could be undertaken in this area looking at the towns in the table below, as well as other towns outside the immediate population band, to determine the level of congestion within the town centre on a typical day and during the summer peak.

Table 3-4: Comparison with other Towns

Route	Population	State Highway as main street	AADT	Form of High Street
Hawera	10,600	No	-	-
Gore	9,700	Yes	10,000	Wide with large planted median and angle parking
Greymouth	9,300	No	-	-
Queenstown	9,100	No	-	-
Waiheke	7,700	No	-	-
Te Puke	7,000	Yes	18,000	Wide with large planted median and angle parking
Waiuru	7,000	No	-	-
Huntly	6,800	No	-	-
Kawerau	6,800	No	-	-
Thames	6,800	No	-	-
Motueka	**6,500**	**Yes**	**13,000**	**Narrow with parallel parking**
Morrinsville	6,400	No	-	-
Matamata	6,300	Yes	9,000	Wide with large planted median and angle parking
Waitara	6,200	No	-	-
Orewa	5,800	No	-	-
Otaki	5,700	Yes	16,000	Narrow with parallel parking
Dannevirke	5,300	Yes	9,000	Narrow with parallel parking
Kerikeri	5,200	No	-	-
Kaitaia	5,100	No	-	-
Ngaruawahia	5,100	No	-	-
Stratford	5,100	Yes	14,000	Wide with median and angle parking

3.4 Crash Analysis

A crash analysis has been undertaken using NZTA's CAS database for the five-year period from 2004 to 2008 for the entire study area.

Of the reported crashes over the five-year period; there were ten serious, 49 minor and 141 non-injury crashes with a total of 200 reported crashes. For the ten-year period there were three fatal, 20 serious, 74 minor and 271 non-injury crashes with a total of 368 reported crashes. Table 3-7 shows the high number of rear end (30%) and crossing/turning crashes (47%) and Table 3-4 above reflects the urban nature of the study area. There are also, however, a significant proportion of loss of control crashes (20%). In addition to the 14 pedestrian crashes identified in the table above, there were 11 crashes involving cyclists which are included in the other movement categories.

Table 3-5: Time of Year (5 year period)

Month	Number of Reported Crashes	Percentage of Reported Crashes
January	18	9%
February	20	10%
March	14	7%
April	17	9%
May	23	12%

June	14	7%
July	19	10%
August	10	5%
September	12	6%
October	21	11%
November	6	3%
December	26	13%
Total	200	100%

The high variation in traffic flows throughout the year as a result of the tourist influx has been investigated in terms of the number of crashes occurring during different months. Table 3-8 shows that only a very slight increase in crashes occurs over the summer period as a result of the increased traffic volumes.

Table 3-6: Distribution of Crashes (5 and 10 year periods)

Year	Fatal	Serious	Minor	Non-Injury	TOTAL
1999 - 2003	3	10	25	130	168
2004 – 2008	-	10	49	141	200
Total	**3**	**20**	**74**	**271**	**368**

Other factors are presented in Table 3-9 and shows that there has been almost a doubling of minor injury crashes in the last five years compared to the previous five years. However, there have been no fatal crashes in the last five years and serious injury crashes have remained constant.

Table 3-7: Crash Type (5 year period)

Crash Type	Number of Reported Crashes	Percentage of Reported Crashes
Head On	4	2%
Hit Object	10	5%
Lost Control	40	20%
Overtaking	10	5%
Rear End	30	15%
Crossing, Direct	19	10%
Crossing, Turning	73	37%
Pedestrian	14	7%
Total	**200**	**100%**

The high number of rear end (30%) and crossing/turning crashes (47%) in Table 3-7 reflects the urban nature of the study area. There are also, however, a significant proportion of lost control crashes (20%). In addition to the 14 pedestrian crashes identified in the table above, there were 11 crashes involving cyclists which are included in the other movement categories.

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The high variation in traffic flows throughout the year as a result of the tourist influx has been investigated in terms of the number of crashes occurring during different months. Table 3-8 shows that only a very slight increase in crashes occurs over the summer period as a result of the increased traffic volumes.

Table 3-9: Other Factors (5 year period)

	Wet	Dry
No	30	170
%	15%	84%

Night	Day
38	162
19%	81%

Weekend (Fri 6:00PM to Mon 5:59AM)	Weekday
55	145
28%	73%

Other factors are presented in Table 3-9 above. The percentage of crashes occurring during wet or dark conditions is lower than the typical percentages for New Zealand.

Further crash analysis for the latest five year period is attached in Appendix B. This includes spreadsheets and graphs showing:

- Severity by year
- Movement
- Time of day and time of year
- Objects hit
- Street lighting
- Weather conditions

The sites with the highest crash costs have also been identified. This specifically included those crashes involving pedestrians, cyclists or heavy vehicles. This analysis is outlined in the table below; it is noted that 55% of the crashes are related to SH60, being either intersection or midblock related.

Table 3-10: Crash Sites

Location	Fatal	Serious	Minor	Non Inj	Total	Ped	Cyclist	HCV
College/Chamberlain	0	2	1	0	**3**	0	1	0
SH60/Pah St	0	1	3	7	**11**	4	1	0
Whakarewa/Queen Victoria	0	1	1	5	**7**	0	0	0
SH60 – 80 south of Poole St	0	1	0	3	**4**	0	1	0
SH60 – 50 north of Greenwood St	0	1	0	2	**3**	1	0	0
Greenwood/Vosper	0	1	0	1	**2**	0	1	0
SH60/Whakarewa	0	0	3	6	**9**	1	0	2
SH60/King Edward	0	0	3	5	**8**	0	0	2
Wharf/Ward	0	0	2	3	**5**	0	2	0
SH60/Wharf	0	0	2	2	**4**	0	0	0
SH60/Tudor	0	0	2	2	**4**	0	0	0
Inglis/Vosper	0	0	2	2	**4**	0	1	0
SH60/Poole	0	0	1	4	**5**	0	0	2
Z CPK DECKS RESERVE – 50e Greenwood/SH60	0	0	2	1	**3**	1	0	0
King Edward – 90 east of Queen Victoria Street	0	0	1	2	**3**	1	0	1
SH60 – 30 north of Wallace	0	0	1	2	**3**	1	0	0
Tudor/Thorp	0	0	1	2	**3**	0	1	0
Whakarewa/Naumai	0	0	1	2	**3**	0	0	1

Appendix B contains a spreadsheet of the above crash sites, ranked by social cost, and identifies common factors or crash causes. The top ten crash sites are summarised below, and have been considered in the options and improvements in Section 7.

3.4.1 Site 1: College/Chamberlain Intersection

There have been three crashes at this site, with two resulting in serious injury and one resulting in minor injury. All crashes were in daylight and during fine weather.

Summary - One crash involved a vehicles crossing at right angles, one involved a vehicle turning right and one involved a cyclist turning from the left side of the road into the path of a motorcycle.

Causes – There is a possible restriction to sight distance to and from side road and the tunnel vision effect from a high hedge row.

3.4.2 Site 2: SH60/Pah Intersection

There have been eleven crashes at this site with one resulting in serious injury, three in minor injury and the remaining seven were non-injury crashes. One crash occurred at twilight and all were during fine weather.

Summary

- Eight of the eleven crashes occurred on SH60
- Two crashes involved an unsupervised child pedestrian; one on Pah Street and one on SH60

- Two crashes involved northbound vehicles hitting a pedestrian crossing SH60 from the right
- Two rear-end crashes occurred when queuing at the pedestrian crossing.
- Four crashes related to drivers failing to give way.

Causes – There is a pedestrian crossing conflict at the intersection, as the crossing is located within the right turn bay development length. The failure to give way crashes could be related to driver frustration when trying to cross or enter SH60 at times of high traffic volumes.

3.4.3 Site 3: Queen Victoria/Whakarewa Intersection

There have been seven crashes at this site with one resulting in serious injury, three in minor injury and the remaining three crashes were non-injury. One crash occurred in the dark (street lighting was on) and all were in fine weather.

Summary

- Six crashes occurred as a result of drivers failing to give way.
- Four crashes involved vehicles crossing from Whakarewa Road heading straight, one involved a right turn and one a left turn merge.
- The other was a rear-end crash on Whakarewa Street.

Causes – Visibility constrained by hedge. Recent Tasman District Council minor improvement project improved sight distances and installed a splitter island at this intersection.

3.4.4 Site 4: SH60 – 50m south of Poole St

There have been four crashes at this site with one resulting in serious injury, two in minor injury and one was non-injury. One crash was at night and another occurred in wet conditions.

Summary

- Three crashes involved vehicles crossing, turning or manoeuvring.
- One was a head on crash after a driver lost control of their vehicle.

Causes – It appears that the crashes are related to the narrow carriageway width due to the adjacent parking.

3.4.5 Site 5: SH60 – 50m north of Pah Street

There have been three crashes at this site with one resulting in serious injury and the remaining two were non-injury crashes. Two crashes occurred at night (street lighting was on) and all were during fine weather.

Summary

- One of the crashes involved a pedestrian.
- All crashes were a result of vehicles manoeuvring.

Causes – Possibly poor street lighting.

3.4.6 Site 6: Greenwood/Vosper Intersection

There have been two crashes at this site with one resulting in serious injury and the other was a non-injury crash. Both occurred during the day.

Summary

- One involved a vehicle overtaking a turning vehicle.
- One involved a driver failing to give way to a cyclist

Causes – no common links with these crashes.

3.4.7 Site 7: SH60/Whakarewa Intersection

There have been nine crashes at this site with three resulting in minor injury and the remaining 6 being non-injury. Three crashes occurred in the wet, and all were during daylight hours.

Summary

- One crash involved a pedestrian running headless of traffic.
- Two crashes involved vehicles merging; one crash involved a right turning vehicle.
- Two of the minor injury crashes involved vehicles crossing or turning.
- One crash was a rear end and two involved vehicles turning being hit by vehicles travelling in the same direction.

Causes – No common links identified with these crashes. There could be some driver frustration when trying to cross or enter SH60 at times of high traffic volumes

3.4.8 Site 8: SH60/King Edward/Old Wharf Intersection

There have been eight crashes at this site; three minor injury and five non-injury. Four occurred in the wet and all were during daylight hours.

Summary

- Six crashes involved turning or through movements failing to give way.
- Two crashes involved vehicles rear-ending, where vehicle had slowed for crossing traffic.

Causes – Drivers failing to give way at a busy intersection.

3.4.9 Site 9: Wharf/Trewavas Area

There have been five crashes within 300m of the Wharf Road intersection with Trewavas Street. Two were minor injury and three non-injury. Two crashes occurred at night and all were in fine weather.

Summary

- Two crashes on Wharf Road involve vehicles overtaking.
- Two crashes involved vehicles manoeuvring, and one involved vehicles merging.

Causes – Overtaking on Wharf Road.

3.4.10 Site 10: SH60/Wharf/High Street South Intersection

There have been four crashes at this site, including two minor injury and two non-injury. One crash occurred in the wet and two were in the dark.

Summary

- Two crashes involved drivers failing to give way at the roundabout.
- One crash involved a driver driving straight through the intersection.
- One crash was due to a driver turning right off SH60 too fast.

Causes – High speeds on the approach to the intersection.

4 Proposed Development

Tasman District Council consulted on the *Motueka West and Central Draft Structure Plan* during March and April 2009. This consultation document outlined Council's proposals for future urban development in Motueka.

The document stated that the population of Motueka is expected to grow from 6408 in 2006 to 6741 in 2031 assuming the medium growth projection. However, the high growth projection would result in a population of 7742. This would require an additional 14ha and 55ha respectively for additional household lots.

In addition, the Motueka and Environs Industrial and Commercial Land Assessment forecast that the following additional land requirements are needed to serve the Motueka area until 2056:

- 24 hectares of industrial land
- 15 hectares of commercial land
- 4 hectares of retail land

The structure plan, as shown on the diagram on the following page, indicates how growth might occur around a greenway system. The consultation document states that "the greenway would provide an amenity area separating the residential area from the business and industrial development area. Compact density housing would be located close to the centre and open space with more conventional housing density beyond. The greenway would include a new pedestrian and cycle link through the area. This linkage would be complemented by a network of indicative roads that improves accessibility on the west side of Motueka. East of the town centre there are opportunities for future commercial development including large format retail and higher density residential development adjoining Decks Reserve. At the southern gateway there are opportunities to enhance the appearance of the town with redevelopment and tourist services close to High Street and the Moutere Inlet".

Known developments and areas of expected growth are outlined below.

- Wahanga Ltd (Trading under the name of Whakatu development group) propose to develop an area of land approximately bound by Queen Victoria Street, King Edward Street, High Street, Grey Street and Pah Street. This area is proposed for residential, commercial and industrial development over the next 50 years.
- Parker Street residential, south of Parker Street;
- Fearon Street residential, south of Fearon Street;
- Sanderlane Drive residential, the northern extent;
- Cemetery Road residential;
- Courtney Street East residential, potential development south of the hospital;
- King Edward Street business, in the vicinity of High Street.

It is understood that the community response to the consultation was generally favourable. It was noted that there needs to be good pedestrian and cycle links between this development and the existing town centre.

As a result of the structure plan and the consultation process, the growth projections that were originally included in the Tasman Growth, Supply-Demand Model (see map and table in Appendix C) have been refined by Tasman District Council. The rate and location of development expected over the next 10 and 20 years for residential and business land uses are now shown in the tables below. The zone numbers in the tables refer to the map as shown in Appendix C.

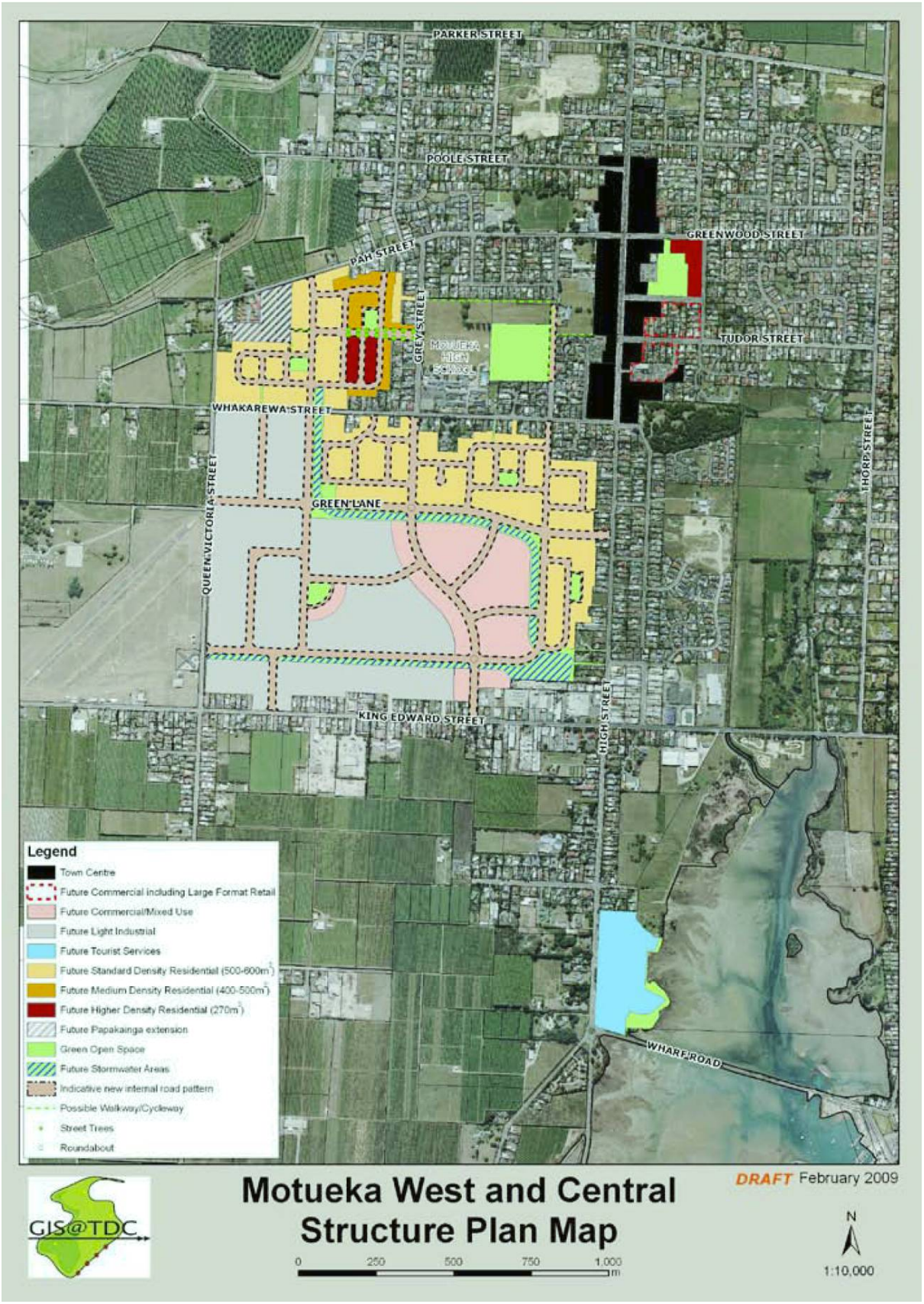


Figure 4-1: Structure Plan Map

Table 4-1: Residential Households

Zone	Location	Additional Households next 10 years	Additional Households years 11-20
1	Parker Street residential	60	45
1	Fearon Street residential	22	17
1	Sanderlane Drive	20	15
1	Cemetery Road	22	17
1	Courtney Street	15	10
7	Wahanga Area	30	20
8	Wahanga Area	45	30
10	Wahanga Area	35	30

Table 4-2: Commercial and Industrial Lots

Zone	Location	Additional Lots Years 10-20	Additional Lots Years 11-20
10	Wahanga Area	10	10
13	Wahanga Area	4	9
14	King Edward Street	7	3

This updated data has been used in the traffic modelling. Further information on the traffic modelling is contained within Section 8.

It is understood that further consultation on the draft Structure Plan will commence on completion of this study.

5 Site Visit

The steering group, comprising representatives of NZTA, Tasman District Council and MWH, undertook a site visit on Wednesday 1 July 2009 to view the issues that had been identified in the inception meeting that had been held earlier the same day. Photos of the site visit are included in Appendix D.

This section summaries observations and thoughts made during the site visits, and thus will assist in confirming the direction for further investigations.

5.1 Key Intersections

The following section outlines the intersections that were visited and the points that were raised during the site visit.

5.1.1 SH60 / King Edward Street / Old Wharf Road

The intersection is a priority controlled cross road. Key observations are:

- Priority to SH60 with side roads Stop controlled.
- High volume of heavy vehicles turning right from SH60 northern approach to King Edward Street. This is due to industrial nature of businesses along King Edward Street (e.g. Concrete and Metals, Contracting)
- Pavement is showing signs of distress.
- Short queues observed on King Edward Street (about 3 vehicles) with low delay.
- Right turn bays on SH60.
- Poor pedestrian cut-down provisions (lack of or incorrect guidance to visually impaired).
- Motueka Clock tower located on north western corner, with key power pole on same corner.
- Large intersection area, possible roundabout as option.
- Mixture of commercial and residential adjacent land use.

5.1.2 SH60 / Whakarewa Street / Woodland Avenue

The intersection is offset left-right stagger with side roads priority controlled. Key observations are:

- Priority to SH60 with side roads Give Way controlled.
- High number of vehicles turning right from SH60 northern approach to Whakarewa Street. Vehicles queuing in right turn bay.
- Mixture of commercial and residential adjacent land use.
- No stopping on both sides of SH60 on both approaches.
- Woodland Avenue is low volume and could possibly be closed to simplify intersection layout.
- This intersection forms the southern extent of the Motueka Town Centre.

5.1.3 SH60 / Tudor Street

This is a T-intersection with pedestrian crossing over SH60 located immediately to the north. Key observations are:

- Priority to SH60 with Tudor Street Give Way controlled.
- Well used pedestrian crossing across SH60 immediately north of Tudor Street. Pedestrian bollards and wire rope around all corners and opposite Tudor Street prevent pedestrians from J-walking.
- No turning provisions on SH60 which can result in turning vehicles restricting the movement of through vehicles.
- Adjacent land use is commercial. Car sales on one corner.
- Parking signage is obscured by landscaping. Also reduces effectiveness of street lighting.
- On-street parking on approaches to intersection was well occupied.

- 2-3 vehicle queues developed quickly when pedestrian crossing was used.

5.1.4 SH60 / Pah Street / Greenwood Street

This is a priority crossroads intersection with Give Way control on side roads. Key observations are:

- Pedestrian crossing on Greenwood Street just about 6m in advance of limit line.
- Pedestrian crossing on SH60 about 15m south of intersection.
- Pedestrian barriers around all corners.
- Noted a number of mobility scooter users.
- Adjacent land use is commercial. Pub / Bars on northeast and southwest corners and convenience store on northwest corner.
- Right turn lanes on SH60 (note southern lane develops through pedestrian crossing), and provision for two lane approaches on both side roads.
- Street lighting effectiveness is reduced by landscaping.
- Cycle parking is on-street (stand is on footpath with bike when occupied on-street).
- Short queues (2-3 vehicles) developing on Pah Street.
- Intersection effectively forms the northern extent of the Town Centre.
- Traffic signals could be an option.

5.1.5 SH60 / Parker Street / Fearon Street

This is a priority crossroads with side roads Give Way controlled. Key observations are:

- Adjacent land use is residential.
- Narrow right turn lanes on SH60, with short left turn provisions. Through lanes appear narrow.
- Narrow shoulder for parking on SH60 on both approaches, with no cyclist provision.

5.1.6 College Street / King Edward Street / Queen Victoria Street

The intersection is a priority crossroads adjacent to Motueka Aerodrome. This forms the western point of the study area. Key observations are:

- Priority to Queen Victoria Street traffic, with side roads Stop controlled.
- Adjacent land use is Aerodrome and residential.
- Right turn bays on Queen Victoria Street.
- Larger intersection area, with no specific cyclist provisions although there is provision further south on Queen Victoria Street, in the form of a shared use path.
- Recent changes to the intersection control removing give way on Queen Victoria Street southbound approach.

5.2 Existing Routes

This section provides a general description of the three north-south routes being:

- High Street
- King Edward Street - Queen Victoria Street – Pah Street
- Old Wharf Road – Thorp Street – Staples Street.

5.2.1 High Street Route

High Street (SH60) provides the key north-south route through Motueka. Starting from the south at the Moutere Inlet Bridge, and heading north to Motueka River Bridge the key features, described as you travel from south to north are:

- Rural 2-lane carriageway with posted limit of 100km/h. This links to Richmond and Nelson.

- Speed limit reduces to 50km/h just south of the intersection with Wharf Road.
- Change to urban environment north of Wharf Road intersection, which is a single circulating lane roundabout. The 2-lane carriageway with central flush median and narrow parking shoulders continues from here north. There is no provision for cyclists, although the low on-street parking demand means that the shoulder can be used safely by cyclists.
- The central flush median ends immediately north of the intersection with King Edward Street, the traffic lane widens and shoulder remains constant width.
- Marked shoulder ends before intersection with Whakarewa Street.
- The adjacent land activity changes approaching Tudor Street from residential to commercial. The marked parking shoulder returns and the parking demand increases which reduces space available for cycling. There is an increase in on-street landscaping. This continues to Pah Street, then parking demand decreases.
- A flush median is introduced from the Pah Street intersection continuing north to just north of Parker Street.
- North of Parker Street the environment changes to semi-rural, then rural, and the speed limit increases to 80km/h about 300m north of Parker Street.
- Between Staples Street and Motueka River Bridge there are cycle provisions on the eastern side of the carriageway. This links to the shared pedestrian / cycleway attached to the bridge.
- Rural 2- lane carriageway which links to Riwaka, Kaiteriteri and Golden Bay.

Overall, there is limited cyclist provision, which is limited further through the town centre where the parking demand increases.

The existing route runs directly through the Motueka Town Centre creating conflict between through traffic and local traffic making it difficult for pedestrians to cross High Street.

5.2.2 King Edward Street - Queen Victoria Street – Pah Street Route

King Edward Street runs from SH60 to Queen Victoria Street and is lined with commercial, light industrial and residential land uses.

Queen Victoria Street commences at the intersection with Wildman Road and continues past King Edward to the intersection with Pah Street. The route is predominately rural to semi-rural and has a shared use path for cyclist between Wildman Road and King Edward Street.

Pah Street is semi-rural for approximately 400m.South of Grey Street the surrounding land use changes to being more urban and this continues to the intersection with High Street. The carriageway cross-section also changes south of Grey Street from rural to urban with kerb and channel and an increase in width. The parking demand is low through this section, increasing closer to High Street. There are two schools on Pah Street.

5.3 Old Wharf Road – Thorp Street – Staples Street Route

Old Wharf Road changes from a wide urban cross section at the western end to a narrower semi-rural cross section at the eastern end. The adjacent land use changes from commercial, including a gym and movie theatre at the western end, to the Goodman Reserve at the eastern end.

Thorp Street has an urban cross section from Old Wharf Road north to Adair Drive. The adjacent land use for this section is residential and the cross section comprises two lanes with on-street parking provisions. Between Adair Drive and Petthybridge Street there is kerb and channel on the western side of the carriageway and swale on the east. North of here the cross section becomes rural and narrow with no centre line. The adjacent land use is farming. North of Fearon Street there is a deep drain on the eastern side of the carriageway.

Staples Street also has a narrow rural cross section with a swale on the southern side of the carriageway, however there are more residential properties in this section compared to the rural northern end of Thorp Street.

The intersection of Stapes Street and SH60 is priority controlled with a give way sign and no specific turning lanes provided on SH60.

5.4 Parking Provisions

All of the streets contained within the study area provide for on-street parking, and it was observed that High Street has a high parking demand and occupancy between Tudor Street and Pah Street. There are off-street parking provisions, which have signage to guide motorist to them, however the signage is not easily visible due to the often small nature of these signs and overgrown vegetation.

The parking survey (results of which were presented in the Issues Identification Report) identified that approximately 70% of all on-street and off-street parking in Motueka town centre is situated to the east of High Street. There are no public off-street car parking facilities to the west.

The provision of signage and guidance from High Street to the off-street car parks could be improved resulting in better utilisation of the car parks, removing some parking manoeuvres from SH60.

It is noted that some of the off-street car parking areas and service lanes may not be used to their full potential due to the right turning movements to or from High Street that are required when entering or existing these facilities.

5.5 Pedestrian Provisions

There are three pedestrian crossings located on High Street between Tudor Street and Pah Street, and a mixture of pedestrian crossings and raised medians crossing intersecting roads with High Street.

The treatment of corner radii, pedestrian cut-downs and tactile paving for the visually impaired is inconsistent throughout the study area.

A high number of mobility scooter users were observed along High Street, and is understood to be typical of the area with a high proportion of elderly.

There is a pedestrian demand over High Street between New World and The Warehouse, located between Whakarewa Street and Tudor Street. Currently pedestrians are using the flush median to cross at a point located between opposing right turn bays.

5.6 Cyclist Provisions

Provisions for cyclists vary from nothing, to wide shoulders, to a dedicated two way cycle path on the shoulder of SH60 from the 50/80 speed change near Staples Street to Riwaka.

In 2002, a 2.3m wide clip-on cycleway was added to the eastern side of the Motueka River Bridge.

The Tasman District Council Walking and Cycling Strategy is currently being revised and will include detailed information about current and future walking and cycling routes in and around Motueka.

6 Summary of Key Issues

Based on the information above including the review of historic reports, recent data collection and a site visit by the project team, the Key issues have been identified as:

- Pedestrians and Cyclists on SH60
    - The location and number of pedestrian crossings are not ideal as pedestrians are choosing not to use the formal facilities. There is also an apparent demand around The Warehouse.
    - There have been a number of reported pedestrian crashes, particularly at the Pah Street intersection with High Street.
    - Pedestrian provisions at intersections are not consistent around the town centre.
    - Need to ensure good pedestrian and cycle connectivity between the existing town centre and the future development proposed between Whakarewa Street and King Edward Street.
    - Lack of on-road cycle provisions.

- Traffic Capacity
    - While congestion is common during the two week Christmas and New Year's period, it is not economic to design for such a short period of time. Nevertheless, the traffic volumes of the entire summer period do result in significant delays on High Street and these do need to be addressed.
    - The capacity of High Street is restricted by existing priority intersection designs, pedestrian movements and on-street parking provisions.
    - There is concern about whether the priority controlled intersections adequately cater for side road traffic during peak morning and evening hours particularly during the peak months.
    - The additional traffic that would be generated by the proposed residential and commercial plan changes to the west of Motueka would place additional demand on the network.

- Routes through Motueka
    - SH60 is seen to sever the town centre and the competing use of High Street for through traffic and local traffic affects efficiency and vitality
    - On-street parking on SH60 may exacerbate the interference between through and local traffic.
    - There is a limited number of routes through Motueka and lack of efficient alternative routes around the town centre.
    - Due to the current legislative and funding environment, a full bypass of Motueka including a new bridge over the Motueka River is not likely to be progressed within the next 10-20 years. Accordingly there is a need to focus on what can be undertaken before such a bypass is constructed.

7 Options Identification

The identification of options to improve the flow of traffic through Motueka focussed on the provision of possible north-south routes. As mentioned above, consideration of a full bypass is specifically excluded from the scope of this study, which instead focuses on improvements which can be undertaken in the short to medium term.

Figure 5.1 below shows the routes identified and these are discussed further in the paragraphs below and summarised in Table 5.1.

Figure 7-1: Route Options

Some localised network improvements off these main routes are likely to be required to safely and efficiently connect the large development areas into the local road network, but these will be considered as and when these are progressed by the developer. Council will seek to obtain developer contributions for these works.

7.1 Upgrade High Street

This is the main north-south route through Motueka. Improvements to the existing route are aimed at improving the throughput of north-south traffic on High Street and improving the safety of pedestrians and cyclists.

Required improvements identified to alleviate issues on this route, listed from south to north, include:

1. Installation of a roundabout at the intersection of King Edward Street and Old Wharf Road with High Street. The roundabout would reduce the crash rate and reduce delay for side road and all turning traffic. This would consist of single approach and circulating lanes.
2. Installation of a roundabout at the intersection of Whakarewa Street and High Street.

   This could be implemented with the restriction of turning movements into the New World and Hickmott Carpark to 'in' only from High Street. The exit would be via Woodland Avenue, onto the proposed roundabout, or Tudor Street. The entry could be further restricted to left-in only, which would reduce the number of vehicle movement conflicts on High Street. Restriction of the turning movements at the High Street entrance to The Warehouse could also be considered by creating an exit onto Naumai Street.
3. Narrow the entrance or install a median island on Tudor Street to encourage turning vehicles to slow down. This will improve the provision for pedestrians across Tudor Street and would include removing the kerb build-out on High Street to allow marking of a right turn bay into Tudor Street.
4. Relocation of the three zebra crossings on High Street closer to pedestrian desire lines and away from intersection conflicts with turning vehicles. One or all of the zebra crossings could be replaced by signalised pedestrian crossings in the future.
5. Marking of parallel parking bays on both sides of High Street between Whakarewa Street and Poole Street. This is to formalise the parking zone, and would retain the existing parking duration of P60 and P10.
6. Narrow the entrance or install a median island on Wallace Street to encourage turning vehicles to slow down. This would improve the pedestrian provisions across Wallace Street. Consideration was given to reinstating two-way flow on Wallace Street but this was discounted as it would likely result in additional delay at the intersection with High Street.
7. Provide kerb build-outs to cater for the existing cycle stands to help promote cycling by provision of a safe location for cycle parking. The existing cycle stands are positioned so that cycles are on the High Street parking shoulder where they could possibly be struck by vehicles.
8. Installation of traffic signals at the intersection with Pah Street and Greenwood Street. This will include facilities for pedestrians to cross.

All the above improvements would have localised benefits such as reductions in side road delays, improving the town centre environment and improving the facilities for pedestrians and cyclists. However, none of the above options on their own, would significantly improve the traffic flow on High Street, especially during the summer period. One option that would improve traffic flows on SH60 is to remove on-street car parking on one or both sides of the street. However, this option was not pursued further due to the adverse effects it is likely to have on businesses, pedestrians and traffic safety. Nevertheless, other options to improve the parking situation are discussed below.

Initial sketches of the above improvements are contained within Appendix E.

7.2 Parking Improvements

High Street on-street parking between Tudor Street and Pah Street is reducing the capacity of High Street due to parking manoeuvres. It was identified in the previous section that the marking of individual on-street parking bays would help to formalise the parking area and could lead to improvements in operation. It was also recommended that the existing parking time restrictions be retained.

An earlier car parking survey report recorded the average car park occupancy on High Street between Tudor Street and Greenwood Street to be 70 – 80% during the March 2009 survey period. At the same time the Decks Reserve Carpark (behind the shops adjacent to and east of this section of High Street) showed occupancy of 60 – 80%.

The adjacent sections of High Street, Whakarewa Street to Tudor Street and Greenwood Street to Poole Street had occupancies of 30 – 45% and 50 – 70% respectively.

It was noted that the signage of parking areas was not clear, and that better utilisation of the existing off-street parking areas could be obtained if signage guiding drivers to the areas and recommending a parking search pattern was erected. A high level parking signage plan is shown in Appendix E on drawing C005.

To be considered in conjunction with this, is changing the existing time restrictions that currently apply to the off-street car parking during the summer peak period when there is an increased demand for short term parking. It is proposed that the parking split between long term and short term parking could be altered to provide more short term parking. This would provide more accessible parking to visitors, and potentially help alleviate congestion by reducing the number of car parking manoeuvres on High Street. A change in the parking split would require agreement with the local carpark users, with potential longer term parking provided at an alternative location further from the town centre, and could be assessed over the next summer peak period by implementing a new regime temporarily.

Another option which should be further considered is the creation of parking areas to the west of the High Street in the town centre to help reduce the number of vehicles turning right across SH60 to access car parking areas.

7.3 Alternative Through Route Options

The following sections identify four options for a short to medium term alternative through route for Motueka.

7.3.1 Option 1 – Thorp Street

Thorp Street, between Staples Street and Old Wharf Road, could be considered as a possible alternative route especially during the summer peak period. The route is likely to be more attractive to southbound vehicles, as it would only require a left turn on and off the route.

Required improvements to this route would include:

- Installation of a roundabout at the intersection of High Street with Old Wharf Road and King Edward Street, as per the “Upgrade High Street” improvements.
- Carriageway widening and piping of the drainage channel for the northern section of Thorp Street.
- Easing of the curve at the intersection of Thorp Street with Staples Street.
- Widening of Staples Street including drainage improvements and possible power pole relocation.
- Improvements to the intersection of Staples Street with High Street. This could be in the form of an improved T- intersection or roundabout.

The use of Thorp Street as a heavy vehicle route conflicts with the adjacent residential land use and it could be difficult to encourage heavy vehicles to use due to the extra distance.

7.3.2 Option 2 – Queen Victoria Street

Queen Victoria Street, between Wildman Road and north of Motueka, was considered in previous reports when the alternative Motueka River Bridge options were being considered. However, the option evaluated in this report does not include a new bridge.

This option has two alternatives at the southern end and three alternatives at the northern end. At the southern end the existing road network could be utilised by starting the alternative route at King Edward Street. A more attractive, yet more costly option would be to create a new intersection and link road from SH60 to Wildman Road. Either option would require local improvements to the corner of the alternative route and Queen Victoria Street to provide priority to the traffic on the new route.

At the northern end, the three alternatives are:

- Connecting back into SH60 via Pah Street. The intersection of Pah Street with High Street has a crash history, therefore installation of traffic signals would be required to control vehicles and pedestrians. This route also passes two schools, which is not ideal for a heavy vehicle route.
- Constructing a new link from the end of Queen Victoria Street to Parker Street, then use Parker Street to access High Street. Improvements would be required at the intersection with High Street to provide for heavy vehicles turning into and out of Parker Street.
- Building on the Parker Street option, a new link from Parker Street running north parallel to the stormwater drainage channel, through the shingle grading plant and intersecting High Street North with a T-intersection or roundabout.

Upgrading and/or widening of the existing Queen Victoria Street carriageway from Whakarewa Street to Pah Street would likely be required for all options. Any of the options could be implemented with the proposed improvements as detailed in “Upgrade High Street”.

With the majority of adjacent land use being semi-rural the affect on properties adjacent to the existing Queen Victoria Street alignment is expected to be minor. Designations will be required for the proposed link, which will affect landowners.

The route would effectively cater for traffic arriving from the west on Motueka Valley Highway, but it could be difficult to attract north-south traffic due to the longer distances, unless the route had a higher speed limit.

7.3.3 Option 3 – Saxon Street / Vosper Street / Wilkinson Street

This route includes Saxon Street, Vosper Street and Wilkinson Street between Fearon Street and Tudor Street. This is currently used by southbound traffic to avoid traffic congestion on High Street. Intersection improvements with High Street would be required to make this route attractive to northbound vehicles, as the time needed to turn right into and right out of the route is likely to be greater than staying on High Street.

Key improvements on the route include:

- Strengthening of the pavement for full length of the route. It is likely that the existing pavement would not handle an increased volume of heavy vehicles.
- Provision of turning lanes on High Street at the intersection with Tudor Street.
- Improvement of the intersection of Fearon Street with High Street to provide for increased volume of heavy vehicles.
- This option could be implemented with the proposed improvements as detailed in “Upgrade High Street”.

The use of the Vosper Street route as a heavy vehicle route conflicts with the adjacent residential land use.

7.3.4 Option 4 – Talbot Street / Manoy Street

The route extends the proposed Manoy Street to Talbot Street link to the north, linking Talbot Street to Poole Street by skirting the edge of Memorial Park.

Key features of the link include:

- Construction of roundabout at the intersection of High Street with Whakarewa Street and Woodland Avenue.
- Intersection improvements to the Whakarewa Street intersection with Manoy Street to promote the route. This is likely to take the form of a right turn bay on Whakarewa Street.
- Construction of a new link from Manoy Street to Talbot Street. This has Rugby Park on the western side and Parklands School on the eastern side.
- New cross-intersection at Talbot Street/Pah Street and a new link to the north. This intersection would provide priority to the new route, with Pah Street traffic giving way.
- Construction of a new link from Pah Street to the north, skirting the eastern side of Memorial Park and intersecting Poole Street at house number 17 or nearby. This will require the purchase and either relocation or demolition of a house.
- New T-intersection with Poole Street and improvements to the intersection of Poole Street with High Street to provide for heavy vehicles.
- This option could be implemented with the proposed improvements as detailed in “Upgrade High Street”.

This route has conflicts with the introduction of heavy vehicles to a residential area, and it also impacts on Rugby and Memorial Parks and Parklands School.

7.4 Temporary Traffic Management

Options 1, 2 and/or 3 could be signed as temporary alternative routes over the peak summer period to reduce the impact on Motueka town centre. This could be in the form of temporary traffic management using barriers and signposting of the detour north-south route. This would require regular signage to reassure drivers they were using the correct route through Motueka.

This could also be implemented for traffic from College Street that is north or south bound.

In essence, this would result in a Town Centre that solely caters for local traffic, perhaps with reduced posted speed limits, and adjacent local streets catering for the majority of traffic. Vehicles would not enter the Town Centre unless this was the destination, in which case drivers would need to make a conscious decision to leave the signed route.

With temporary traffic management, a possibility exists to create different routes for northbound and southbound traffic. Northbound traffic could be directed along the King Edward Street – Queen Victoria Street – Pah Street route and southbound traffic along the Staples Street - Thorp Street – Old Wharf Road. This would result in only left turn movements being required on and off SH60 to reduce the delays associated with turning movements.

This proposal could also be used to promote the options above on a temporary basis to allow evaluation of their effectiveness and possible impacts on the adjacent land owners.

7.5 Selection of Preferred Alternative Through Route Option

Because of the large number of options, a preliminary assessment was undertaken to score the practical issues that may preclude an option from being implemented regardless of its traffic patterns.

Table7-1 summarises the current characteristics of the routes under the following categories:

- Links;
- Intersections;
- Pedestrian and cycle;
- Heavy vehicles, and
- Other.

Table 7-1: Summary of Route Characteristics

Option	Links	Intersections	Pedestrian and Cycle	Heavy Vehicles	Notes
Upgrade High Street	• Adjacent residential/ commercial land use. • Passes through town centre. • Three closely spaced pedestrian crossings in town centre. • Good pavement condition. • High vehicle delays in town centre– especially in summer.	• All priority T or X. • Some intersections have crash history.	• No specific cycle provisions. Some shoulders. • Footpaths on both sides. • Number of pedestrian crashes in town centre area.	• Currently use this route as through route and local access.	• Possibly the do minimum. • Most direct route for all vehicles. • High crash rate.
Option 1 Thorp Street	• Adjacent residential land use. • Pavement could need strengthening. • Deep road side drains at northern end. • Northern section is narrow.	• Intersections with SH60 will require modification to promote route.	• No specific cycle provisions, no shoulders at northern end. • Footpaths along southern extent.	• Conflicts with residential land use.	
Option 2 Queen Victoria Street	• Adjacent residential land use, passes aerodrome, some farm land. • Mixture of urban and semi-rural environment. • Passes two schools, kindergarten and Marae. • Good pavement condition. • Requires improvements/new road links at southern and northern extents.	• All priority T or X. • Pah / Greenwood intersection and Queen Victoria/Whakarewa Intersection have crash history.	• No specific cycle provisions except off-road adjacent to some of Queen Victoria Street. • Some footpaths.	• Difficult to force HV to use longer route.	• Needs new road construction, land designations.
Option 3 Saxon/ Vosper/ Wilkinson	• Adjacent residential and commercial land use. • Pavement could need strengthening.	• All priority T or X. • Improvements needed to all intersections. • Narrow local intersections.	• No specific cycle provisions. • Footpaths on both sides.	• Possible existing through route, during summer peak.	• Conflict with adjacent land use.
Option 4 Talbot/ Manoy	• Adjacent residential, school, kindergarten, Rugby and Memorial Parks. • Pavement would need strengthening. • New Link required	• All priority T or X. • Improvements needed to intersections.	• No specific cyclist provisions. • Existing has footpath both sides.	• None at present.	• Needs new road construction, land designations.
Option 5 Traffic Management	Could be implemented on Option 1, 2 and/or 3 above Advantages include the low cost Disadvantages include that it only provides relief during the peak season and it could be seen as being visually unattractive.				

Table 7-1 above was used to identify the options with greater potential. To assist with this, a score has been applied to each option as shown in Table 7-2, ranging from "0" (no issue) to "3" (major issue).

Table 7-2: Preliminary Option Assessment

Option	Link	Intersection	Pedestrian and Cycle	Heavy Vehicles	Other	Overall Rating
Upgrade High Street	1	1	2	2	1	**7**
1: Thorp Street	3	1	2	2	0	**8**
2: Queen Victoria Street	1	1	1	1	0	**4**
3: Vosper Street	3	2	1	3	0	**9**
4: Talbot Street	1	1	1	3	0	**6**

No weighting has been applied, but Table 7-2 suggests that Option 2, Queen Victoria Street, and Option 4, Vosper Street, show more potential as a possible alternative route.

The temporary traffic management option has not been included in the table above as the impacts are dependant on the route chosen. Furthermore, the impacts are likely to be greater than other options during the peak season but negligible during the remainder of the year. This option is seen as a promising short term solution and has been retained for further consideration.

Locating a permanent alternative through route, and therefore a large number of heavy vehicles, down residential streets is considered to be a fatal flaw. Accordingly, Option 1, Thorp Street, and Option 3, Vosper Street, have not been brought forward into the traffic modelling stage.

Nevertheless, all options have been retained for the consultation phase of the project.

8 Traffic Modelling

Traffic modelling for the study area has been developed through a simplified spreadsheet traffic distribution model of the Motueka network and detailed analysis of key intersections and a pedestrian crossing over High Street.

The network model was used to test the alternative route options and SIDRA intersection modelling was used to evaluate the intersection improvements on High Street.

The following sections summarise the development of the models and present the results.

8.1 Network Modelling

The simplified spreadsheet traffic distribution model created for this study contains all arterial routes within Motueka. This was developed and tested for July 2009. The traffic volumes within the model were then factored up to represent the summer 2009 peak period.

To create the future year models, both background traffic growth and the new traffic generation from the proposed developments have been used to calculate future traffic volumes. This process is discussed further below.

8.1.1 Base Model Calibration and Validation

The spreadsheet model was calibrated against MWH and Opus turning and link counts using July 2009 as the base.

Calibration was carried out by adjusting the turning proportions of the modelled intersections where no turning counts were available to match the link flows provided by Tasman District Council. The model was also calibrated by factoring the flows along the links to represent the gain or loss of the traffic due to the developments along the links.

The spreadsheet model required an iterative approach to balance the downstream flows with the upstream flows while avoiding “circular reference” errors (this necessitated “hard-coding” of about 20 flows and manually changing these flows to achieve a reasonable equilibrium convergence). The developed 2009 morning and evening peak models were calibrated with the observed flows at the key intersections basically replicated and the link flows were within the 10% of the observed for the (mainly two-way) link flows.

The 2009 morning and evening models were validated by comparing the model link counts with surveyed link flows which were not utilised as part of the model development or calibration.

It showed that there was only small or negligible discrepancy between the model link flows and the surveyed link flows.

8.1.2 Peak Season Flows

From analysis of the traffic count information obtained at the telemetry site at Riwaka and the non-continuous traffic count stations in Motueka, the following seasonal correction factors were derived. These seasonal correction factors were applied to adjust the mid-year observed flows (July 2009) to represent the higher summer flows.

- AM peak hour seasonal correction factor: 1.20
- PM peak hour seasonal correction factor: 1.15

8.1.3 Future Flows

All existing count data was analysed to determine appropriate growth factors of the external flows to the model. The growth factors were determined to be:

- Traffic growth on SH60: 2.5 % per annum
- Traffic growth Western Motueka: 2 % per annum
- Traffic growth Eastern Motueka: 1.5 % per annum

Based on the above factors, Table 8-1 lists the growth factors applied to the model for 2019 and 2029 peak hour traffic volume with 2009 winter as the base.

Table 8-1: Growth Factors (to create summer models)

	2009 AM	2009 PM	2019 AM	2019 PM	2029 AM	2029 PM
SH 60	1.20	1.15	1.50	1.44	1.80	1.73
Western Motueka	1.20	1.15	1.44	1.38	1.68	1.61
Eastern Motueka	1.20	1.15	1.38	1.32	1.56	1.50

For internal growth, the 2019 and 2029 traffic generation from Wahanga, greenfield developments and infilling was estimated based on forecasting the number of residential, business and industrial lots as detailed in Section 3 – Proposed Developments of this report.

The estimated trip generation rates, calculated using the Trips Database Bureau guidelines, were moderated to reflect that some of the trips would be from/to outside of Motueka and should be included in the external traffic flows.

For the residential developments, it was assumed that 0.9 trips were generated in the peak hour and that the total inbound and outbound trip split was assumed to be 0.4 and 0.5 trips per lot respectively during the morning peak hour, and 0.5 and 0.4 respectively during the evening peak hour.

Tables 8-2 and 8-3 summarise the residential and business and industrial development areas respectively. Areas the zone numbers refer to are in Appendix C.

Table 8-2: Residential Trip Generation

Zone	Peak Hour Trips per Household
All	0.9

Table 8-3: Business and Industrial Trip Generation

Zone	Ground Area per lot (m^2)	Building Area per lot (m^2)	Trips per 100 m^2	Peak Hour Trips per building	External Peak Hour Trips per building	Internal Peak Hour Trips per building
10	500	150	2	3	1	2
13	2000	667	2	13	2	11
14	1000	300	2	6	2	4

For the future year models, the turning proportions resulting from network changes were manually adjusted using professional judgment. This aimed to identify the most likely route that the development traffic would use.

The trip patterns derived from the model for the base network and future year options were used for the SIDRA modelling on key intersections along High Street.

An inherent assumption in the above process is that any new intersections for the Wahanga development would efficiently accommodate all turning traffic, and that traffic would not re-route to avoid an intersection operating at or above its capacity.

It is considered that the future 2029 flows are generous and represent the upper level of traffic growth. For the purposes of the study, they are considered suitable for testing the "resilience" of the existing network and proposed network options, and for a basis of estimating indicative benefits of intersection and route upgrades. Further detailed analysis would need to be undertaken on any options before funding is requested.

8.1.4 Options tested

The do-minimum for the option testing is taken as essentially being the do-nothing, i.e. continuation of the existing maintenance and safety regime, but no capacity improvements except those required within the development areas to distribute the generated traffic to the existing road network. The full level of development, as discussed in Section 4, will still proceed.

The upgrade high street option has not been modelled with the network model as the spreadsheet is not sensitive to the relatively minor modifications. The individual intersections have been modelled with SIDRA as presented later in this chapter.

As discussed above, only Option 2, Queen Victoria Street, and Option 4, Talbot Street, have been subject to the network modelling as the other two alternative routes are not considered to be practicable.

8.1.5 Network Results Summary

Table 8-4 and 8-5 summarise the traffic volumes in 2019 and 2029 for the base network, Option 2 and Option 4 on six key roads:

- High Street (south of Greenwood)
- Queen Victoria Street (south of Whakarewa)
- Pah Street (West of SH60)
- Whakarewa Street (West of SH60)
- King Edward Street (West of SH60)
- Thorp Street (south of Greenwood)

Table 8-4: Traffic modelling volumes in 2019

		AM			PM		
2019	**Dir[n]**	**Base**	**Option 2**	**Option 4**	**Base**	**Option 2**	**Option 4**
High Street (south of Greenwood)	NB	527	430	393	754	686	611
	SB	698	676	573	678	582	543
Queen Victoria Street (south of Whakarewa)	NB	176	318	176	253	329	253
	SB	92	147	93	177	226	190
Pah Street (West of SH60)	WB	317	335	261	353	358	313
	EB	263	291	214	270	257	212
Whakarewa Street (West of SH60)	WB	279	289	327	366	345	428
	EB	284	258	329	338	338	394
King Edward Street (West of SH60)	WB	248	251	248	296	267	295
	EB	281	225	281	407	312	407
Thorp Street (south of Greenwood)	NB	59	59	59	65	65	65
	SB	40	42	40	68	67	68

Table 8-5: Traffic modelling volumes in 2029

		AM			PM		
2029	**Dir[n]**	**Base**	**Option 2**	**Option 4**	**Base**	**Option 2**	**Option 4**
High Street (south of Greenwood)	NB	671	578	494	939	778	754
	SB	860	754	718	821	787	678
Queen Victoria Street (south of Whakarewa)	NB	233	292	233	329	480	329
	SB	154	254	160	199	335	219
Pah Street (West of SH60)	WB	393	397	333	431	407	351
	EB	360	322	297	347	328	284
Whakarewa Street (West of SH60)	WB	342	351	414	432	424	506
	EB	384	395	440	436	410	477
King Edward Street (West of SH60)	WB	360	362	365	400	391	401
	EB	382	387	382	492	388	492
Thorp Street (south of Greenwood)	NB	71	76	71	77	77	77
	SB	51	50	51	85	80	85

The spreadsheet network modelling shows that Option 2 will reduce the traffic on High Street and increase the traffic volume on Queen Victoria for the morning and evening peak periods and reduce the traffic on King Edward Street in the evening peak. No other significant changes were identified.

For Option 4, the model forecasts that the traffic volume on High Street and Pah Street will decrease and traffic volumes on Whakarewa Street will increase. No other significant changes were identified.

Based on the traffic modelling outputs, Option 4 (Talbot Street) attracts the most traffic, reducing the number of vehicles on the congested section of High Street (between Whakarewa Street and Pah Street) and based on traffic attraction is a desirable alternative route to High Street. This decrease is estimated to be in the order of 120 to 180 vph depending on the time of day and the forecast year. This compares to 20 to 100vph for the Queen Victoria Street option.

Printouts from the spreadsheet models are attached in Appendix F.

8.2 Intersection Modelling

Intersection traffic analysis has been undertaken using the traffic modelling package SIDRA. This allowed the operation of the existing intersections to be analysed, and then compared to different intersection and route options.

In addition to the intersection models, a model of the pedestrian crossing over High Street, just north of Tudor Street, has also been built. This allowed comparison to a signalised mid-block crossing option.

The models have been developed for the morning and evening peak periods for the 2009 winter peak and the 2019 and 2029 summer peak periods.

The models were developed for:

- Existing network.
- Existing network with improvements to key intersections on High Street.
- Alternative Route Option 2.
- Alternative Route Option 4.

8.2.1 Intersection Results Summary

A summary of the intersection results is presented in Table 8-7 below. Furthermore, Appendix F contains summary sheets and SIDRA outputs for the intersection and pedestrian crossing traffic modelling.

The tables presented show average delay per vehicle and the Level of Service (LOS) for both the worst movement and the intersection as a whole (where appropriate). Level of Service is a quality measure describing operational conditions at the intersection. For this study, the HCM method was used within SIDRA which determines the level of service based on average delay. Table 8.6 below describes the different Levels of Service in relation to intersections.

Table 8-6 : LoS Description

Level of Service	Description based on Austroads
A	General free flow conditions with minimal stopped delay at intersections
B	Relatively unimpeded operation with low stopped delays.
C	Stable operating conditions but motorists experience longer queues.
D	Conditions border on a range in which small increases in flow can significantly increase intersection delay.
E	Significant intersection delays and very long queues.
F	Intersections would be severely congested (over-saturated) with extensive queuing and delay.

Key observations from the modelling are noted below.

8.2.1.1 Existing Situation

The SIDRA modelling shows that in 2009, all intersections have an average delay of less than 8 seconds per vehicle. However, some movements at a couple of intersections are subject to high average delays of over 20 or 30 seconds per vehicle in peak periods. These typically are straight through and/or right turning movements from the side roads.

If no improvements are implemented by 2019, the additional traffic forecast on the network results in the overall average delay at a number of intersections increasing significantly, with SH60 / Pah Street / Greenwood Street and SH60 / Whakarewa Street both showing delays of over 50 seconds per vehicle in a summer peak hour.

In 20 years time, all modelled intersections on High Street, if retained in their current format, would have at least one movement which is operating at Level of Service F, which means that the movement would be over-saturated. Average intersection delay also reaches very high levels for all intersections except SH60 / Parker St / Fearon St.

8.2.1.2 Improvements

All intersections with significant improvements suggested by the study do result in a decrease in delays. However, if no alternative route is progressed in the short term then additional capacity improvements may be required at the SH60 / Tudor Street intersection, such as signalisation. Furthermore, if a full Motueka bypass is not progressed in the medium to long term, then additional capacity improvements may be required at the SH60 / Pah St / Greenwood St and SH60 / Parker St / Fearon St intersections to cater for the additional traffic generated by the proposed developments.

8.2.1.3 Alternative through routes

The intersections were also modelled to see how they would perform based on the turning movements predicted by the network model should one of the alternative through route options be progressed. The output of this modelling is included in the Appendix F.

8.2.1.4 Intersection Summary

A summary of the results for each intersection is described below.

- SH60 / Parker St / Fearon St
    - The overall average delay at the intersection in the peak hour is around 2 to 3 seconds and this will increase to 4-8 seconds by 2029
    - The delay for the worst movement over this same time period is predicted to increase from 14-15 seconds to 40-60 seconds in the peak hour, resulting in LOS E/F for this movement
    - Option 2 would result in improvements to both intersection and overall delay
    - Option 4 would result in little change to the delays as the same volume of traffic would still be travelling through the intersection.
    - Improvements include widening the intersection to assist turning manoeuvres for the Parker Street extension to Option 2, which only slightly improves the level of service
- SH60 / Pah St / Greenwood St
    - The overall average delay at the intersection in the peak hour is 5-7 seconds; however this increases to 40-50 seconds by 2019 and over 2 minutes by 2029.
    - The delay for the worst movement is currently 20-30 seconds, but this will increase to over 7 minutes by 2019
    - Options 2 and 4 would result in some reduction in delays, but capacity improvements to the intersection would still be warranted

  - Signalising the intersection would bring intersection delays down to around 25-30 seconds and the worst movement down to around 45 seconds in 2019. Overall LOS for the intersection is predicted to be D in 2019 and D/E in 2029.

- SH60 / Tudor St
  - The overall average delay at the intersection in the peak hour is 4-6 seconds, with this increasing to 35-45 seconds by 2029.
  - The delay for the worst movement is currently 25-35 seconds, but this could increase to around 5 minutes in the PM peak.
  - Options 2 and 4 would result in some reduction in delays, but the delays to the worst movement would still be 30-50 seconds or even up to 2 ½ minutes in 2019.
  - Installing a right turn bay for traffic turning into Tudor Street will also result in improvements to both overall intersection delay the worst movement delay.
  - Furthermore, if signals are installed at SH60 Pah St / Greenwood St then some traffic will re-route to these. Also if a roundabout is installed at SH60 / Whakarewa St then traffic may turn left out of Tudor Street and turn around at the roundabout.
  - Nevertheless, additional capacity improvements may be required in the medium to long term, depending on the timing of a full bypass.

- SH60 / Whakarewa St/ Woodlands Ave
  - The overall average delay at the intersection in the peak hour is 7-8 seconds, with this increasing to 30-50 seconds by 2019.
  - The delay for the worst movement is currently 35-40 seconds, but this could increase to over 10 minutes in the PM peak.
  - Option 2 would result in some reduction in delays, but the delays to the worst movement would still be very high in 2019.
  - Option 4 would result in a different traffic distribution and therefore higher delays for the side road traffic.
  - Installing a roundabout at this location would have significant improvements in delay for both the whole intersection and the worst movement. Delays for the intersection would reduce to 6-8 seconds in 2019 and 10-20 seconds in 2029. The worst movement would be subject to delays of 20-50 seconds in 2029. Delays would be slightly higher if this intersection is implemented with Option 4.

- SH60 / King Edward / Old Wharf
  - The overall average delay at the intersection in the peak hour is around 6 seconds, with this increasing to 15-25 seconds by 2019 and up to 2 ½ minutes by 2029.
  - The delay for the worst movement is currently 25-30 seconds, but this could increase to over 4 minutes in the PM peak in 2019.
  - Option 2 would result in some reduction in delays, but the delays to the worst movement would still be high in 2019.
  - Option 4 would result in little change to the delays as the same volume of traffic would still be travelling through the intersection.
  - Installing a roundabout at this location would have significant improvements in delay for both the whole intersection and the worst movement. Delays for the intersection would reduce to 7-8 seconds in 2019 and 10-15 seconds in 2029. The worst movement would be subject to delays of less than 20 seconds in 2029. Delays would be slightly higher if this intersection is implemented with the short Option 2 alternative route.

- College / Queen Victoria / King Edward
  - The overall average delay at the intersection in the peak hour is around 7 seconds, with this increasing to around 10 seconds by 2029.
  - The delay for the worst movement is currently around 12 seconds, increasing to 17 seconds in the PM peak.
  - Option 2 would result in some increase in delays, but all movements would be less than 30 seconds even in 2029
  - No improvements are proposed for this intersection.

Table 8-7 : SIDRA Results Summary

	AM Peak						PM Peak					
Current Layouts	2009		2019		2029		2009		2019		2029	
Delay (sec/veh)	Worst Movement	Intersection	Worst Movement	Intersection	Worst Movement	Intersection	Worst Movement	Intersection	Worst Movement	Intersection	Worst Movement	Intersection
SH60 / Parker St / Fearon St Current Layout	13.9	2.3	20.7	2.8	39.6	4.5	15.5	3.0	25.1	4.4	58.9	8.2
SH60 / Pah St / Greenwood Current Layout	26.5	6.5	467.0	51.7	2546.4	288.4	23.9	5.6	467.5	39.9	1773.0	149.5
SH60 / Tudor St Current Layout	24.2	4.4	105.7	10.5	446.5	33.0	34.1	5.6	307.6	19.7	715.7	43.1
SH60 / Whakarewa St Current Layout	34.6	7.0	339.0	28.9	1449.7	115.3	37.9	7.4	825.7	51.8	1423.1	97.9
SH60 / King Edward St Current Layout	27.8	6.2	107.2	12.8	1332.8	107.3	24.1	6.4	261.0	26.8	1777.5	150.8
King Edward St / College St Current Layout	12.1	7.0	13.9	8.0	17.2	9.7	11.6	7.1	13.8	8.0	17.6	9.7

	AM Peak						PM Peak					
Improved Layout	2009		2019		2029		2009		2019		2029	
Delay (sec/veh)	Worst Movement	Intersection	Worst Movement	Intersection	Worst Movement	Intersection	Worst Movement	Intersection	Worst Movement	Intersection	Worst Movement	Intersection
SH60 / Parker St / Fearon St Intersection Widening	14.0	2.1	22.5	2.6	39.6	3.7	17.3	2.9	26.2	3.9	46.3	5.6
SH60 / Pah St / Greenwood Traffic Signals	36.7	21.9	45.2	27.6	72.2	34.0	37.0	22.2	45.9	29.7	101.6	38.9
SH60 / Tudor St Right Turn Bay	21.3	2.4	57.5	3.6	275.3	8.6	27.5	2.9	142.2	5.9	378.1	12.0
SH60 / Whakarewa St Roundabout	12.6	5.9	14.8	6.6	20.8	9.4	13.3	6.0	17.9	8.1	49.9	20.3
SH60 / King Edward St Roundabout	11.9	6.3	13.2	7.2	18.5	10.1	11.7	6.6	14.5	8.1	19.8	13.4
King Edward St / College St No Improvements Proposed	12.1	7.0	13.9	8.0	17.2	9.7	11.6	7.1	13.8	8.0	17.6	9.7

Key

Level of Service A
Level of Service B
Level of Service C
Level of Service D
Level of Service E
Level of Service F
Level of Service not applicable (priority intersection)

8.2.2 Pedestrian Crossing

The pedestrian crossing across High Street, immediately north of Tudor Street, was surveyed as part of the Tudor Street intersection survey so that it could be modelled and compared to a traffic signal controlled mid-block crossing.

Table 8-8 to 8-10 summarise the modelling results for the zebra pedestrian crossing and a possible signalised pedestrian crossing for peak periods in 2009 and 2029.

Pedestrian signals with cycle timings of 60 seconds and 150 seconds have been undertaken as probable minimum and maximum cycle times. It is noted that the most appropriate cycle time will likely be somewhere within this range.

The modelling shows that the zebra crossing fails before 2029, with high vehicle delays and long queues. Installation of a signalised pedestrian crossing reduces the vehicle delays and queue lengths, although it does result in an increase in pedestrian delay from 0 seconds for a zebra, to 24 to 69 seconds depending on the cycle time. The risk with high pedestrian delays is pedestrians may choose to ignore the traffic signals and cross against the signals or in a different location.

Table 8-8: Zebra pedestrian crossing results

	AM Peak 2009	PM Peak 2009	AM Peak 2029	PM Peak 2029
Vehicles per hour	863	1112	2609	2885
Pedestrians per hour	39	43	104	101
Intersection Delay (sec/veh)	0.3	0.4	224.4	154.8
95% Queue (vehs)	3.0	4.1	275.8	195.2
Intersection Delay (sec/ped)	0.0	0.0	0.0	0.0

Table 8-9: Signalised pedestrian crossing results – 60 sec cycle

Pedestrian phase every cycle (every 45 secs)

	AM Peak 2009	PM Peak 2009	AM Peak 2029	PM Peak 2029
Vehicles per hour	863	1112	2609	2885
Pedestrians per hour	39	43	104	101
Cycle Time (sec)	60	60	60	60
Intersection Delay (sec/veh)	4.6	5	83.7	138.4
95% Queue (vehs)	7.5	10	115.8	154.6
Intersection Delay (sec/ped)	24.3	24.3	24.3	24.3

Table 8-10: Signalised pedestrian crossing results – 150 sec cycle

Pedestrian phase every third cycle (Every 135 secs)

	AM Peak 2009	PM Peak 2009	AM Peak 2029	PM Peak 2029
Vehicles per hour	863	1112	2609	2885
Pedestrians per hour	39	43	104	101
Cycle Time (sec)	150	150	150	150
Intersection Delay (sec/veh)	1.8	1.9	4.5	5.5
95% Queue (vehs)	7.3	9.7	49	64.4
Intersection Delay (sec/ped)	69.1	69.1	69.1	69.1

Comparison of the zebra crossing and the signalised pedestrian crossing confirms that future improvements to traffic flow can be made with signalisation, which could be further enhanced if other traffic signals were installed, say at the Pah Street intersection, and linked via SCATS. The risk is increasing the pedestrian delays to levels considered unacceptable by locals.

9 Consultation

A consultation strategy was prepared for this study and agreed by the Steering Group in October 2009. The consultation strategy basically involved sending key stakeholders a summary consultation document (see Attachment G) and an invitation to meet with representatives of the Steering Group.

Meetings were arranged on the following dates with the following key stakeholders:

- 2 November 2009:
    - Tiakina te Taiao
- 10 November 2009:
    - Keep Motueka Beautiful
    - Our Town Motueka (Business Association)
    - Economic Development Agency
    - Road Transport Association
    - Motueka Community Board
    - Motueka Ward Councillors

The Road Transport Association (RTA) was invited to attend following a specific request from Bill Findlater of the Economic Development Agency (EDA). Also Paul Heywood, fruit grower and Tasman District Council liaison person for the Automobile Association (AA), was provided a copy of the consultation document (on request).

The Bicycle Nelson Bays (BNB) representative, Richard Butler was also invited to attend the meetings and to provide feedback. A written response was received.

The stakeholder representatives expressed some surprise that there had not been wider community consultation at this stage. There is an expectation that the wider community and directly affected parties, such as landowners and Wakatu Incorporation will be consulted prior to implementation of improvement works and selection of the preferred alternative route options. BNB advised that the time frame for responses did not allow them to fully discuss with its members.

9.1 Feedback

Six written submissions were received. A number of verbal comments and submissions were also made at the consultative meetings.

There was a general appreciation of the detail in the consultation summary document. Tiakina did consider, however, that the consultation document did not make it clear that the study had taken the long term project traffic volumes, including the Motueka West Draft Structure Plan into account. Further advice has now been provided and subsequent discussions held with Wakatu Incorporation consultants to alleviate this concern.

A summary of both the written and verbal submissions is outlined in the tables below.

Q1: Do you agree with the identified issues? If No, why?

Tiakina te Taiao – No

- Impacts of Draft Structure Plan to meet 50 year growth of Motueka ignored.
- No apparent analysis based on traffic volumes, travel times or crash information in consultation document.
- Possibility of bypass and new bridge not considered.
- Need to have long term outlook.
- Require strategy to ensure longer term solutions not precluded by short term fixes.
- High Street provides poor level of service at times other than summer holiday period.

Road Transport Association – Yes

- Agree main issue is congestion

Automobile Association – Yes

- Mitigating congestion on High Street (town centre) must be progressed with urgency

Bicycle Nelson Bays

- Focus should be on traffic calming in "shopping precinct" between Whakarewa and Pah Streets
- Insufficient priority for pedestrians and cyclists

Our Town Motueka – Yes

Economic Development Association – Yes

Motueka Community Board and Ward Councillors– Yes

Keep Motueka Beautiful – Yes

Q2: Are there other issues which you would like to see addressed?

Tiakina te Taiao – Yes

- Consultation document does not address any of the transportation issues of the proposed development plan for area west of High Street.
- Wish to see operating speed in Town Centre kept round the 30kph (assessed current speed).

Road Transport Association – Yes

- Control of pedestrians – currently poor visibility of pedestrians by motorists.

Automobile Association – Yes

- Reduce inefficient stop start of vehicles.

Bicycle Nelson Bays

- Conflict from vehicles exiting from shops onto SH60 – worst being Shell Petrol Station.

Economic Development Association – Yes

- Strategy required for temporary traffic management, immediate improvements and alternative routes in medium term.

Keep Motueka Beautiful – Yes

- Ownership of Whitwells car park, poor access.

Our Town Motueka – Yes

- Encourage/educate for parking away from the main street.

Motueka Community Board and Ward Councillors– Yes

- Priority for Talbot-Manoy link
- Better utilisation/existing carparks
- Roundabouts to provide 'entrance' to town.
- 'Too good a job' in short term may not justify bypass and remain with congestion in High Street.

Q3: Do you agree with the options for High Street? If not, why?

Tiakina te Taiao – Yes

- However short term solutions and not likely to improve traffic flows.

Road Transport Association – Yes

- Priority for roundabouts and controlled pedestrian crossings.

Automobile Association – Yes

- Support roundabouts and signalised pedestrian crossings.

Bicycle Nelson Bays

- Does not support roundabouts as off putting and dangerous to cyclists.

Economic Development Association – Yes

Keep Motueka Beautiful – Yes

- Concern re possible loss of landscaping.

Our Town Motueka – Yes

Motueka Community Board and Ward Councillors– Yes

- Need to check location/relocation of pedestrian crossings (eg. cafes near Tudor Street)

Q4: Are there other improvements you would like to see implemented?

Tiakina te Taiao – No

- No other changes required on High Street

Road Transport Association – Yes

- Restricted traffic access into individual businesses directly from High Street.

Automobile Association – Yes

- Wallace Street be reinstated two way with no right turns into Wallace or Tudor, in conjunction with the roundabouts and traffic signals as proposed. (Note purpose built visitor centre in Wallace Street)

Bicycle Nelson Bays

- Reduced parking on SH60.

Economic Development Association – Yes

- Should cyclists road share with trucks, or encourage alternative routes.

Keep Motueka Beautiful – Yes

- Maintain current level of landscaping.

Our Town Motueka – No

Motueka Community Board and Ward Councillors– Yes

- More provision for cyclists.
- Streetscape – redo if pedestrian crossings moved.
- Consider impact of mobility scooters.
- No right turns into Wallace Street.
- Widen road to allow turning into Tudor Street.
- Move some trees and bollards back to improve traffic flow.

Q5: Do you think an alternative route is needed and should it attract all through traffic, holiday traffic or just heavy vehicle traffic?

Tiakina te Taiao – Yes

- Effects of current and future development will support road for bypass.
- Attractive to all traffic.

Road Transport Association – Yes

- Needs to be attractive to all users.
- At peak times heavy vehicles and vehicles towing trailers encouraged to use alternative.

Automobile Association – Yes

- Needs to attract heavy vehicle traffic.

Bicycle Nelson Bays – No comment

Economic Development Association – Yes

- Primarily for heavy vehicle traffic.

Keep Motueka Beautiful – Yes

Our Town Motueka – Yes

- Primarily to attract heavy vehicle traffic.

Motueka Community Board and Ward Councillors– Yes

- Primarily to attract heavy vehicle traffic.

Q6: Which of the alternative through route options identified do you think most beneficial for Motueka?

Option 1: Thorp Street
Option 2: Queen Victoria Street
Option 3: Vosper Street
Option 4: Talbot Street
Option 5: Traffic Management

Tiakina te Taiao –

Option 2: Queen Victoria Street - Preferred

- Predominantly rural in nature.
- Provide direct access to proposed industrial area associated with plan change.
- Route can be progressively upgraded.
- At southern end can create link to SH60 via Wildman Road with short term via King Edward Street.
- At northern end, connect to SH60 with Staples Street. Use of Pah Street in short term to recognise Te Awhina Marae, at corner and current issues with vehicle speeds.

Other Options 1, 3 and 4 not supported.

Option 5: Traffic Management

- Consider will create confusion to travellers and is not supported.

Road Transport Association –

Option 2: Queen Victoria Street - Preferred

- Treatments for connections to SH60 needed at southern end either direct link via Wildman Road or intersection improvement at King Edward Street, preferable at roundabout.
- At northern end prefer connection to SH60 north of Staples Street connection.

Option 1: Thorp Street – possible short term

- South bound only unless access onto SH60 at Staples Street made easier.

Option 5: Traffic Management

- High Street remains route of choice until alternative route of similar distance and travel time provided.

Automobile Association –

Option 1: Thorp Street – preferred short term

- Require roundabout at King Edward Street and Old Wharf Road.
- Require roundabout at Staples Street/SH60.

Option 2: Queen Victoria Street – preferred medium to long term

- At southern end access via Wildman or in vicinity need to address safety issues with proximity to current roundabout.
- At northern end linkage via Parker Street preferred over route traversing base of stop banks due to loss of productive land.

Economic Development Association –

Referred to Road Transport Association and Automobile Association for comment.

Keep Motueka Beautiful – Yes

- No preferred option advised.
- Alternative route required to give clear definition for traffic.

Our Town Motueka –

- No preferred option advised.

Motueka Community Board and Ward Councillors– Yes

Option 2: Queen Victoria Street - Preferred

- Alternative route via Queen Victoria Street with suitable connection in to SH60 at northern and southern ends.
- Roundabout at King Edward Street provides interim connection.
- Need to confirm alternative routes to west, say via Chamberlain extension not viable in long term.

Option 1: Thorp Street – possible short term

- Require improvements at Old Wharf Road and Staples Street.

Option 5: Traffic Management

- High Street remains route of choice until alternative route of similar distance and travel time provided.

It is noted that from analysis of the comments received, there appears to be a lack of understanding about the traffic management option and it possible benefits in the immediate future.

9.2 Other Comments

In addition to the responses to the specific questions, a number of other comments and suggestions were received both during the meeting and on the written submissions. These comments are outlined below.

9.2.1 Identified Issues

- Agree with issues raised.
- Has study considered effects of traffic flows from proposed Motueka west development and likely new intersections with High Street.
- Possible lack of traffic analysis to address long term effects now and in future.
- Right turns from High Street difficult and inefficient, such as Pah Street and Tudor Street.
- Lack of control of pedestrians.
- Conflicts with streetscape with visibility of pedestrians.
- Measures resulting in any increase in speed on High Street would not be supported.
- Pah Street/Queen Victoria Street intersection needs addressing.
- Agree there is lack of efficient alternative routes around the town centre.
- Agree parking needs clearer definition.
- Focus on traffic calming between Whakarewa and Pah Streets
- Conflicts with shop access from and egress to High Street

9.2.2 Roundabouts

- King Edward Street roundabout long overdue, most important entrance to town, include suitable streetscaping.
- Support proposed roundabouts at Whakarewa Street, however need to consider disruption to through traffic as priority.
- Roundabouts at Staples Street for access, across from alternative route.
- Use roundabouts as ‘entrance’ to town centre.
- Opposed to new roundabouts as off-putting and dangerous to cyclists.

9.2.3 Pedestrian Crossings

- Relocation of crossings supported.
- Final choice of crossing places to consider traffic generated from businesses such as cafes.
- Support use of controlled signalised crossings, especially at Pah Street.
- Improve visibility of pedestrians at crossings, remove current conflict with streetscaping.

9.2.4 Right Turns on High Street

- Strong support for changes at Tudor Street to provide for a right turn bay.
- Support changes at Wallance Street
- Some suggest no right turn onto Wallace Street.
- One suggestion for no right turn into Tudor Street.
- Support for traffic signals at Pah Street to provide efficient right turn onto High Street.

9.2.5 Cyclists

- Oppose roundabouts as off-putting and dangerous for cyclists
- Support for cycle provision but insufficient room unless parking removed.
- Consider provision for cyclist's routes alternative to High Street.
- At likely vehicle speeds, cyclist's able to travel within traffic flow.
- Support protection of cycle stand areas.

9.2.6 Carparks and Service Lanes

- Strong support for improved signage.
- Support linkage from roundabouts to carparks.
- Urgent need for Talbot-Manoy link and connection to Whitwells carpark.
- Ownership/purchase of land for carparks.
- Need to make better use of existing carparks.
- Need for carparks on west side of High Street
- Better use of service lanes and reduce direct access from businesses onto High Street.
- Reduce parking on SH60

9.2.7 Streetscaping

- Need to resolve visibility conflicts with pedestrians.
- Want to retain good level of streetscaping.
- Use streetscaping at 'entrance' roundabouts.

9.2.8 Alternative Routes

- Definite need for alternative route/bypass.
- Generally strong support for Queen Victoria Street (Option 2) as alternative route in short to medium term and with development as the longer term alternative including new bridge crossing.
- Connections to SH60 preferred generally north of Staples Street and via Wildman Road subject to safety issues being resolved.
- Some support for Thorpe Street as interim but subject to connection treatments at north and south.
- No support for temporary traffic management nor alternative route options using Vosper or Talbot Streets.
- Need for selection of longer term alternative/bypass route to fit with proposed development plans.
- Roundabout at King Edward Street would encourage use of Queen Victoria Street option.
- Need to address likely short term impacts on Pah and/or Parker Street.
- Some informal use made of Thorp Street option in peak season.
- High Street will be preferred heavy vehicle route until attractive alternative provided.
- Likely need to retain existing bridge if new bridge on future bypass some distance from communities served.
- Some concern re loss of productive land for Queen Victoria Street extensions.

Copies of the written responses are attached in Appendix G.

10 Scheme Components and Costs

Based on the traffic modelling and consultation, the following options have been identified to cater for current and future traffic in Motueka:

10.1.1 Alternative Through Route Options

Two options could cater for traffic wishing to avoid the town centre:

- Option 2: Queen Victoria Street from Wildman Road to north of Parker Street. This reduces the traffic volume on High Street through the Town Centre and offers a viable alternative north-south route for traffic from the proposed Wahanga Ltd development. This option could be staged to accommodate the increased level of demand in the future. Included with Option 2 is the intersection upgrades where the route ties back into the existing SH60.
- Option 4: Talbot Street. This option is a more localised alternative route, running from Whakarewa Street to Poole Street and is expected to remove more traffic from the High Street than Option 2. Included with Option 4 is the installation of a roundabout at the High Street intersection with Whakarewa Street.

As a result of the consultation phase, the most appropriate alternative through route is seen to be Option 2: Queen Victoria Street, however cost estimates for both options were developed.

A full Scheme Assessment Report will be required to more completely evaluate all through route options. This investigation will need to consider the potential for traffic diversion but also other factors, similar to those identified in Section 7.5, such as:

- Cost (this is discussed in Section 10 below).
- Suitability for heavy vehicles.
- Impact on surrounding land use, including whether any changes are required to the growth strategy.
- Impact on High Street businesses.
- Assessment of the environmental impacts.
- Need for pedestrian and cycle provision.
- Timeframe.
- Likelihood of funding.

Consideration will also need to be given in regards to the impact of the routes in relation to the costs and benefits of a future possible bypass of Motueka, including a new bridge.

As an interim solution in the immediate future, an alternative route signed with temporary traffic signs could be used to divert through traffic only during the peak season.

10.1.2 High Street Upgrade Improvements

A number of different improvements have been identified along SH60 which could be implemented with or without an alternative through route:

- High St / Fearon St / Parker St intersection: provision of turning lanes to reduce impact of turning vehicles on through traffic.
- High Street Town Centre Upgrades: includes pedestrian crossings relocation, parking route signage, turning lanes at the High Street / Tudor Street intersection and improved linemarking.
- High St / Whakarewa St / Woodland Ave roundabout to reduce delays for turning vehicles.
- High / King Edward / Old Wharf roundabout to reduce delays for turning vehicles.

- Queen Victoria /Wildman intersection, Wildman / SH60 intersection and link: required for Option 2.
- High / Pah / Greenwood traffic signals to reduce delays for all vehicles.
- Talbot Street extension: required for Option 4.
- Mid-block pedestrian signals to reduce delays for through traffic on High Street.

10.1.3 Cost Estimates

Preliminary cost estimates of the improvements and options outlined in the previous section are summarised in Table 10-1, with feasibility estimates provided in Appendix H. The cost estimates include a contingency of 25% and are based on aerial photography with no survey or pavement testing.

Table 10-1: Component Costs

Component	Drawing No.	Capital Cost ($000)
Queen Victoria St extension – Stage 1 (Pah – Parker)	**1a**	2,900
Queen Victoria St extension – Stage 2 (Parker – High)	**1b**	3,740
High / Fearon / Parker intersection - turn lanes	**2**	310
High Street Town Centre (pedestrian crossings relocation, parking route signage, linemarking)	**3**	650
High / Whakarewa / Woodland roundabout	**4**	500
High / King Edward / Old Wharf roundabout	**5**	330
Queen Victoria /Wildman intersection, Wildman / SH60 intersection and link	**6**	1,680
Talbot Street extension	**7**	1,840
Mid-block pedestrian signals	**-**	200
Temporary Traffic Management	**-**	2 per day

Table 10-2 summarises the capital costs for the upgrade of the existing High Street and for Options 2 and 4. The cost for the alternative through routes reflects those components that would be required to ensure the route is attractive to through traffic.

Table 10-2: Capital Costs

Option	Components	Combined Capital Cost ($000)
Upgrade High Street	3, 4, 5	1,500
Option 2 (Stage 1)	1a, 2, 6	4,900
Option 2 (Stage 2)	1b, 6	5,400
Option 4	4, 7	2,300
Temporary Traffic Management	Assuming four weeks	56 per year

While many improvements are proposed for High Street, these would not need to be undertaken concurrently; unlike the alternative through route components which would need to be constructed at the same time.

The High Street improvements could also be progressed in conjunction with an alternative through route as the improvements would still have a benefit to the town centre. If this was the case, timing of the project would need to be given further consideration; some improvements could be undertaken before the alternative route is completed to improve the High Street environment immediately, others could be delayed as the new route would reduce traffic demand on this main arterial.

The total cost of Option 2 (long term), if it were constructed as one project instead of staging, would be less than the addition of Option 2 medium and long term. The cost savings relate to Parker Street pavement works and onsite establishment.

11 Conclusions and Recommendations

The competing uses of Motueka High Street as both a through route and a town centre have resulted in a road that serves neither function particularly well. This study investigated the issues that are currently present in Motueka in relation to traffic movements through the town centre and has proposed a number of options to alleviate the both the current concerns and also the issues which will be created in relation to the proposed development that will increase traffic volumes in the town centre.

The recommendations from this report have been divided into four categories in relation to when the measures should be implemented; immediate, short term, medium term and long term.

11.1 Immediate (Years 0-2)

11.1.1 Temporary Traffic Management

Implement a temporary traffic management solution to cater for through traffic within the summer peak periods. This could involve a northbound route via Queen Victoria Street and a southbound route via Thorp Street.

11.1.2 Minor High Street Improvements

These include:

- Installing a right turn bay and narrowing the entrance or installation of a median island on Tudor Street
- Narrowing the entrance or installation of a median island on Wallace Street
- Relocation of the three pedestrian crossings closer to the pedestrian desire lines. This will also involve an assessment of the streetscaping elements of the High Street environment to ensure that the pedestrian crossing locations are not shaded or hidden by street furniture or trees.
- Marking of the parallel parking bays on High Street
- Provision of kerb build-outs to cater for the existing cycle stands
- Improving the signage of off-street car parking facilities.

11.2 Short Term (Years 2-10)

11.2.1 Alternative Through Route

This should initially involve monitoring of the performance, compliance and issues related to the temporary traffic management solution, as this will assist in understanding how the other alternative through route options would perform. Concurrently, investigation could continue into the options of providing a permanent alternative route and this should be implemented within the short-term.

Option 2, Queen Victoria Street, is seen as being the preferred option for an alternative through route. It is recommended that due to the safety and capacity issues at the SH60/Pah Street/Greenwood Street intersection and the narrow unsuitable nature of Parker Street, that the alternative through route include a northern extension that ties into SH60 north of Parker Street. In the short term, King Edward Street is considered to be the most appropriate connection at the southern end of the scheme.

11.2.2 High Street Improvements

These include:

- Installation of a roundabout at the intersection of SH60 with King Edward Street and Old Wharf Road.
- Installation of a roundabout at the intersection of SH60 with Whakarewa Street along with restriction of turning movements at the New World and The Warehouse accessways.
- Installation of traffic signals at the intersection of SH60 with Pah Street and Greenwood Street
- Creation of off-street parking areas on the western side of SH60 to help manage turning flows at intersections.

11.3 Medium Term (Years 10-20)

11.3.1 Alternative Through Route

In the medium term, the Queen Victoria Street route should be extended to the south to Wildman Avenue and a new link provided from Wildman to SH60 to provide a more complete alternative through route for Motueka.

It is also recommended that the Talbot Street-Manoy Street link (similar to that proposed as part of Option 4 between Whakarewa Street and Pah Street) be progressed at this stage to provide additional internal circulation around Motueka. This would also need to provide for servicing to the rear of the businesses on the western side of High Street and also access to Whitwells car park to remove traffic from High Street.

11.3.2 High Street Improvements

Monitoring of High Street and it's intersections with the side roads in particular should continue throughout this period as the true nature of the developments are realised. Additional capacity improvements are likely to be required at the intersection of SH60 and Tudor Street (such as traffic signals) as turning vehicles become subject to longer delays.

11.4 Long Term (Years 20+)

11.4.1 Motueka Bypass

As a result of the current funding environment, it is unlikely that construction of a full Motueka bypass including a new bridge over the Motueka River would attract central government funding in the short or medium term. However, it is noted that the timing of the bypass is also dependant on the condition of the current bridge. The remaining structural life of the bridge has been assessed as being approximately 25 years and it has no freeboard in the event of a 1% annual exceedence probability flood. Accordingly, these issues may result in the need for a new bridge at an earlier date.

Previous studies recommended that the location of the new bridge be in line with either Queen Victoria Street or Chamberlain Street. Whilst this study has not investigated bypass options, the Queen Victoria Street bridge would be consistent with this study's recommendation to providing an alternative through route via Queen Victoria Street.

11.4.2 High Street Improvements

Once the full bypass of Motueka has been constructed, no further capacity improvements would likely be needed on High Street.

However, the removal of through traffic from High Street does present an excellent opportunity to traffic calm the town centre and further improve the visual and social amenity of the area.

Appendix A – Previous Reports' Summary

1 Summary of Previous Reports

1.1 Motueka Bypass Scoping Study - Interim Report

This report was completed in June 1991 and investigated the existing situation and three options being the upgrade of High Street, an eastern bypass and a western bypass.

Key points to note about the options are below.

Existing Situation – High Street

The report stated that this is an arterial for through traffic, a local collector road, and a major commercial street so has three competing roles to provide. The high volumes of traffic and side friction result in average speed as low as 25km/h through the town centre during peak periods and there are many intersections and associated turning movements to commercial properties.

There is a high concentration of commercial buildings, and at the time of the report the Council plan was for continued commercial growth in this area. It was noted that parallel on-street parking manoeuvres were causing delay and there was a threat of community severance between the two halves.

Existing Situation – Motueka River Bridge

The Motueka River Bridge was in poor condition, with some spans being prior to 1918, and is very narrow (5.5m total width) requiring some heavy vehicles to stop to allow oncoming traffic through.

There were no cyclist or pedestrian facilities on the bridge thus creating severance to the north (there is now a shared pedestrian/cycle facility across the bridge).

Corrosion was common in the bridge beams causing spalling and it only has capacity for 50 year flood, emergency scour protection was required in1990 and it was estimated that the bridge would need replaced by 2010.

Options Considered
Do Minimum – Upgrade of High Street

This option was not considered viable for the following reasons:

- Difficult to provide four lanes as not enough space, parking would need to be removed from most of the length.
- Possibility of developing rear servicing access for High Street discounted.
- Continued severance of the community.

Eastern bypass via Thorp Street

This option was not considered viable for the following reasons:

- Council plan for continued residential growth in this area
- Sensitive environmental area at the estuary would make it difficult to construct a bridge.

Western bypass via Queen Victoria Street or Chamberlain Street

These options were considered ideal for the following reasons:

- Limited residential growth in this area (although comparatively more on Queen Victoria Street)
- Possibility for high (100km/h) design speeds

These options would both require a new bridge that would cater for an acceptable design flood. The Queen Victoria Street option would need to be around 600m long, with Chamberlain Street being around 300m long. The Chamberlain Street option also included a possible bypass of Riwaka by using Swamp Road. Advantages of the Queen Victoria Street option included fact that it has been in the plan since 1983 – residents would not be surprised.

All of the bypass options require Maori Land.

1.2 Motueka Bypass Scoping Study

This report was undertaken in September 1991 and was an extension of the previous report with the following additional comments being made:

- A major redevelopment of the existing alignment of SH60 would be socially and economically unacceptable to the local community.
- The heavily built up nature and degree of residential and commercial development along High Street complicate any major improvements. Heavy vehicles, intersections and parallel parking manoeuvres all reduce the capacity of the route.
- SH60 widening would require land purchase between Monahan and Whakarewa Streets, which is about 800m of residential property.
- SH60 widening would require removal of parking pushing it out to other streets.
- With the SH60 upgrade, heavy vehicles would still travel through the town centre. The retention of the existing bridge is an important strategic consideration in the evaluation of any bypass, it would be good for the community to have two bridges, i.e. upgrade existing as well for local traffic.
- Approximately 80% of the traffic volume over the bridge is local.
- If the Chamberlain Street option is used and the existing bridge is demolished then this would create a high degree of severance.
- An eastern bypass is unacceptable as a result of serious engineering, environmental and planning constraints.

In addition, common issues with the Western bypass were raised:

- Removing the bridge will likely have large social impacts for the community
- It would be best to stick to existing roads to avoid loss of Class 1 productive land
- Several conditions placed on construction by Maori due to many archaeological sites
- Motueka District Scheme (1982) proposed a bypass on Queen Victoria Street that connected back to the existing bridge.

In regard to the traffic modelling, the following assumptions were made:

- Origins and destinations of vehicles assumed based on results from a number plate survey.
- Likelihood of using bypass estimated.

The BCRs of the options assuming construction in 1991 were calculated and these are summarised in Table 1.

Table 1: Summary of BCRs for construction in 1991

	Option Chamberlain	Option Queen Vic 1	Option Queen Vic 2
New bypass and removal of the existing bridge	1.3	1.1-1.8	1.5-2.3
New bypass but retention of the existing bridge (i.e. two bridges)	1.1	0.7-1.1	1.0-1.5

The range of BCRs for the Queen Victoria Street option is due to uncertainties as to whether a long bridge would be required or a series of weirs.

The BCRs of the options assuming construction in 2001 were also calculated and are summarised in Table 2.

Table 2: Summary of BCRs for construction in 2001

	Option Chamberlain	Option Queen Vic 1	Option Queen Vic 2
New bypass and removal of the existing bridge	2.8	2.6-4.8	2.8-5.1
New bypass but retention of the existing bridge (i.e. two bridges)	1.7	1.1-1.6	1.4-2.0

1.3 Motueka Bypass Investigation Report

This report is dated June 1992 and answers questions raised by the previous two Motueka Bypass Scoping Studies as to how long the bridge needs to be and whether better crash savings can be achieved.

In summary, the following bridge lengths were recommended:

- Queen Victoria Street – 400m long bridge with $100,000 for flood protection (1992)
- Chamberlain Street – 350m long bridge with $50,000 for flood protection (1992)

Additional crash savings were expected by separating the local traffic and through traffic improving the alignment, widths, intersections and reducing traffic flow through Motueka.

Table 3 summarises the BCR for the revised schemes.

Table 3: Summary of BCR (1992)

Option	BCR
Bridge Replacement (better alignment)	2.0
Queen Victoria Bypass	4.3
Chamberlain Bypass	3.9

The report concluded that retaining the existing bridge at Class 1 is not economic although it could be retained at a lower posting. The travel distances for local travel between Riwaka and Motueka is greater for the Chamberlain Street option although this could be negated if the existing bridge is retained, thus increasing the BCR.

Detailed bridge inspections showed that the western five spans require replacing and significant structural repairs are required for the remaining 20 spans.

An outline plan was developed for public consultation.

1.4 Options for Motueka and Riwaka – Information Kit

This kit is a series of publicity brochures handed out during public consultation in May 1993. All information is based on the previous reports.

1.5 Motueka Bypass Technical Review

This report was prepared in September 1993 and recommended that the existing Motueka River Bridge be retained by the Council as long as it is given a major maintenance overhaul. The report expects that with maintenance the bridge can be retained as a light vehicle route for approximately 50 years. This would mean that the sewer main currently attached would not need to be relocated.

The report also listed options for development of High Street, these include creating off-street car parks/parking buildings and development of service lanes/access roads as well as intersection upgrades. Staged development of the Queen Victoria Street bypass was not supported as this would not alleviate congestion.

The report includes a series of drainage upgrade options for the bypass.

1.6 State Highway 60 Options Motueka and Riwaka - Scheme and Environmental Impact Assessment Consultation Report

This report further developed the schemes included in previous reports and presented them as a scheme assessment report.

Key conclusions from public consultation undertaken as part of this process included:

- Need to improve conditions on SH60 and remove HCVs from central Motueka.
- Significant support for a bypass
- No clear consensus as to the preferred location.
- Chamberlain Street cannot proceed until a large (expensive) flood control system is installed in Riwaka.
- There is support for an improved Do-minimum, such as a HCV bypass.
- Want to retain links from CBD to bypass.
- Pedestrians and cyclists must be provided for in bridge and road design.

Crash records from 1988 to 1992 show there were 45 urban injury crashes, 31 of which occurred at intersections. There were also 8 pedestrian crashes and 5 cyclists crashes. 16 crashes (5 injury and 11 non-injury) occurred with parked cars or manoeuvring to park.

An improved do-minimum option included provision of a heavy vehicle bypass. No detailed analysis was undertaken but it was expected to include widening and upgrades, although it was noted that this will simply transfer the issues such as noise, vibration, and pollution to another street.

The heavy vehicle routes considered include:

- Thorp Street (Old Wharf Road to Staples Street)

- Queen Victoria Street (Pah Street/Parker Street)

It was noted that the heavy vehicle bypasses would be the Tasman District Council's responsibility and not Transit's.

Submissions suggest that double parking by commercial vehicles is a major cause of congestion. This could be alleviated by providing service lanes to the rear of commercial areas. The possibility of altering the parking layout to reduce the impact of parking vehicles was also considered. Other ideas include:

- Strict parking enforcement
- Limiting hours of HCV unloading to outside peak times

Concerns were raised in regards to the safety of the large numbers of school children using Queen Victoria Street (to access Motueka High School). Actions recommended for pedestrian and cyclist provisions on the bypass options included:

- Footpath on at least one side of a Chamberlain Bridge
- Footpaths on both sides of a Queen Victoria bridge
- 8 metre carriageway for all bridges to allow sharing with cyclists
- Minimum of 1.5m shoulder on all sealed road sections for cyclists and parked vehicles

Different options were considered for a northern link to the bypass:

- Poole Street – narrow and highly residential
- Pah Street – difficult intersection with High Street and little space for improvement
- Parker Street – requires new road construction but has most space for intersection improvements

Concerns were also raised that the Queen Victoria Street option would restrict growth to the west causing severance of the town.

1.7 Motueka Corners - Investigation Report

This report was undertaken in July 1994 and looked at locations on the State Highway network where side roads intersect on curves. They concluded that minor physical works could alleviate the traffic issues that are expected as traffic volumes increase.

The corners looked at for minor safety improvements were:

- Aranui Corner
- Packing Shed Corner
- Riwaka Corner

It appears that all of the recommended changes have been made.

1.8 State Highway 60 Options for Motueka and Riwaka - Scheme and Environmental Impact Assessment Final Report, Volume One (of Two) (JULY 1994)

The report identified the existing problems to be:

- Existing Motueka River Bridge is on a poor alignment with substandard width, it is in poor repair and theoretically should be posted at 60% Class1.
- BCR for bridge replacement means that this option is no longer justifiable
- If major expense is invested to repair the bridge, a replacement could not be justified for 10 – 20 years.
- Problem exists between through and local traffic conflicts causing congestion.
- There is estimated to be a 50% increase in traffic over summer
- The rest of SH60 is substandard with many right-angle curves and reduced width (7.5m)
- Existing effects include noise, fumes, congestion, difficulties finding parking, perception of reduced safety for non-motorised users.
- Traffic Engineering Issue include HCV = 12-15% weekdays on SH60 and 29% on the Motueka river Bridge. Existing traffic models show no increase in speed through the town centre due to the bypass.
- Problem is perceived to be in management of traffic on High Street

The options were again refined:

- Bridge lengths reviewed; replacement of existing = 390m, Queen Victoria Street =400m, Chamberlain Street = 350m.
- Queen Victoria Street would require a change between an urban and a rural cross section along its length.
- Much of Queen Victoria Street is a former state highway and is in good pavement condition, minimal widening and shape correction would be required. The Chamberlain Street option would require pavement rehabilitation over the entire length.
- The Do-Minimum option was confirmed as repairing the existing bridge rather than replacing it. Using this assumption, the BCRs for the three main options were reported as follows:

Table 4: BCR summary

Option	Replace Bridge	Queen Vic bypass	Chamberlain bypass
BCR	1.0 to 3.0	1.9 to 4.0	1.7 to 3.2

The scheme report recommended the Chamberlain Street option as it had the following advantages over the Queen Victoria Street option:

- Less development alongside the route
- Better alignment north of the river
- Will not create a severance issue
- Less impact on historic sites

It was noted that Chamberlain Street is more expensive and would require some cost sharing with TDC in relation to drainage near Riwaka. The option of improving high street was abandoned.

1.9 State Highway 60 Options for Motueka and Riwaka - Scheme and Environmental Impact Assessment Final Report, Volume Two (of two) (JULY 1994)

This volume has a quick summary of all previous reports and a large submission from local Maori but is predominately traffic count and analysis.

1.10 Motueka Car Parking and Service Lane Review (February 1994)

This report looked at car parks and service lanes within Motueka in order to fulfil the following objectives:

- Identify a future layout for service lanes and car parks
- Identify land ownership details for Council purchase
- Summarise a landowner/business/user survey
- Recommendations on costs and a staged development

Existing service lanes are generally unused and not owned by the Council. These have been identified on the maps. There are around 400 fewer parking spaces provided than is required under the district plan. The report outlined that 64% of businesses that replied have no customer parking, 23% of businesses have more than 20 deliveries per week. 54% take deliveries from the street.

The most severe issues identified were:

- Congestion in High Street due to delivery vehicles
- Congestion in High Street due to traffic volumes
- Lack of parking on the north end of the business area
- Improper use of existing service lanes

The options proposed were:

- Full bypass of Motueka
- Provision of loading zones along High Street. These could reduce double parking, provide good access, but would reduce the number of parking spaces.
- Upgrading existing service lanes. These would be taken under Council control and would reduce double parking, use existing infrastructure and provide a high level of access to businesses.
- Combining the library and Supervalue car parks.
- Council to plan and provide for future parking requirements, i.e. parking buildings/public areas
- Formalise Tudor to Wallace service lane and consider making it one way to discourage use as a rat run.
- Construct a service lane from Tudor Street to Woodlands
- Formalise service lane between Wallace and Greenwood.
- Formalise 'Whitwells' car park
- Formalising several other service lanes.

Recommendation was to provide additional service lanes, which should be 7m wide minimum with turning or through facilities. There was a three year, ten year and ultimate plans for development presented, but it was suggested that only a bypass would reduce the problems.

1.11 Motueka Traffic Study (March 1997)

This traffic study looked at developing options to achieve the following the objectives:

- Reduce the congestion on High Street and adjoining streets
- Reduction in HCV in the CBD
- The outcome of the study with any recommendations or conclusions is reviewed as an affect on the future bypass.

By the time of this report the bridge had been repaired reducing the BCR of the bypass.

The report noted that some intersections were developing a safety problem, these being:

- King Edward/SH60
- Greenwood/Pah/High
- Whakarewa
- Taylor
- Queen Victoria/Whakarewa

A major issue was identified as being double parked service vehicles. These were observed but didn't seem to cause the problem suggested by other sources. Trucks find it easier to double park than to use narrow service lanes which are then hard to exit from. Suggested that service lanes are hazardous and should not be encouraged due to reversing trucks.

Options identified include:

- High Street/Greenwood/Pah
  - Traffic signals.
  - Or relocation of the pedestrian crossing further south.
- Tudor/High
  - Needs pedestrian crossing facilities
- Double parking on High Street
  - Stricter enforcement
  - More loading P10 parks
- Improvements to pedestrian facilities and crossings and footpath gradients can be hard to negotiate
- Widening of High Street between Whakarewa Street and King Edward Street
- Improvements to the pedestrian environment on High Street
- Connect Manoy Street to Talbot Street and promote as a service lanes to for High Street properties.
- Develop car parking areas
- Develop parallel arterial route to the west of the CBD.
- Investigate a roundabout at High Street/King Edward Street
- Review lighting and sign posting in accessways and car parks
- Upgrade street furniture and landscaping.

1.12 Motueka and Environs - Industrial and Commercial Land Assessment (March 1997)

This report noted that Motueka has everything it needs for business to grow except space. Expected forecasts are 3,600 additional people in Motueka and Environs by 2056. The prime area for development was noted to be west Motueka.

1.13 Motueka River Flood Control – Scheme Update

The purpose of this report was to prepare a preliminary design of the proposed upgrade scheme to the specified design standards based on desktop information and limited site investigation and provide a cost estimate and programme for consultation, consenting and detailed design phases leading up to the start of construction.

The report noted that the SH60 Bridge over the Motueka River was assessed to have no freeboard to the 1% AEP (annual exceedence probability) flood event top water level(including climate change allowance), and that normal freeboard to NZ Transport Agency bridges was 1 metre. The freeboard allows for debris floating down the river to pass under the bridge without obstruction.

One of the design requirements was for the proposed stop banks to be 0.6m higher than the design flow, thus the proposed stop banks will be higher than the existing. In addition to this, the stop bank cross section would be designed to have a 4m wide crest, 1 vertical to 2.5 horizontal side slope on the river side and 1:2 side slope on the land side. The landward side toe is designed to stay in its original position with the increased width of the cross section (5 to 10m) to encroach into the river flood way.

1.14 Motueka Parking Survey

MWH undertook a parking survey of the Motueka CBD in March 2009. The results were presented in a factual report, and form the basis for future surveys and comparisons.

The survey recorded both peak and off-peak parking for on-street and off-street car parks in the following areas:

- High Street. This was split into three sections that are:
  - Section 1 – between Whakarewa Street and Tudor Street
  - Section 2 – between Tudor Street and Greenwood Street
  - Section 3 – between Greenwood Street and Poole Street
- Greenwood Street
- Pah Street
- Wallace Street
- Tudor Street
- Hickmott Carpark
- Decks Reserve carpark.

The results showed that off-street car parking was 50 to 80% occupied, with the peak period between 10am and 2pm and the duration generally one hour or less. For the on-street parking occupancy was 40 to 60%, relatively consistent across the day with duration generally one hour or less.

The three sections of High Street showed an occupancy from 30 to 80% consistent across the day with duration generally one hour or less.

Appendix B – Crash Analysis

Moutueka Transportation Study Crash Analysis [2004-2008]

	Road	Distance	Direction	Intersection	Location	Reference	Date	Day	Time	Movement	Veh & Dirn	Causes	Object	Curve	Wet	Light	Weather	Junction	Control	Markings	Speed Limit	Fatal	Serious	Minor	Pedestrian	Cyclist	Easting	Northing
1	CHAMBERLAIN ST			I	HURSTHOUSE ST	2451785	4/05/2004	Mon	1720	AA	CS1C	331A 338A 505A 818	BB	R	D	B	F	T	N	C	100	0	0	0			2508177	6007619
2	COLLEGE ST			I	CHAMBERLAIN ST	2411030	16/01/2004	Fri	1815	LB	MW1C	303B 375B		R	D	B	F	X	S	C	100	0	1	0			2508242	6009249
3	COLLEGE ST			I	CHAMBERLAIN ST	2511210	3/02/2005	Wed	1110	HA	MW1V	321B		R	D	B	F	X	S	C	100	0	1	0			2508242	6009249
4	COLLEGE ST			I	CHAMBERLAIN ST	2411522	30/03/2004	Tue	950	GC	MW1S	174B 372B		R	D	B	F	X	S	C	100	0	0	1		75	2508242	6009249
5	COLLEGE ST	400	E		QUEEN VICTORIA ST	2550602	2/08/2005	Tue	1700	CB	CE1	132A 358A	F	R	D	B	F		N	C	70	0	0	0			2509154	6009214
6	COLLEGE ST	50	W		QUEEN VICTORIA ST	2712046	6/04/2007	Mon	1245	JA	4W1M	308B 375B 929		R	D	B	F	D	N	C	70	0	0	1			2509504	6009201
7	COLLEGE ST	190	W		QUEEN VICTORIA ST	2757341	19/12/2007	Wed	1005	GE	4W1C	160A 920		R	D	O	F	D	N	C	70	0	0	0			2509364	6009205
8	COLLEGE ST	300	W		QUEEN VICTORIA ST	2750013	1/04/2007	Thu	5	EA	CW1C	502A	M	R	D	DN	F		N	C	50	0	0	0			2509254	6009210
9	GLENAVEN DRIVE	20	W		CLAIRE PLACE	2613342	13/12/2006	Wed	1755	MD	4W1C	308B 371B 929		R	D	B	F	D	N	N	50	0	0	2			2512073	6009631
10	GREENWOOD ST	40	E		SH 60	2650269	2/07/2006	Tue	1400	EA	CW1V	129A	M	R	D	B	F		N	N	50	0	0	0			2510963	6010731
11	GREENWOOD ST	60	E		SH 60	2452064	5/10/2004	Mon	740	LB	CW1C	303B 375B 926		R	D	O	F	D	G	C	50	0	0	0			2510983	6010731
12	GREENWOOD ST	80	E		SH 60	2450626	2/04/2004	Wed	1545	JA	CE1C	303B 309B 922		R	D	O	L	D	N	C	50	0	0	0			2511003	6010730
13	GREENWOOD ST			I	VOSPER ST	2411658	23/03/2004	Tue	1730	HA	SE1C	302B 352B 375B		R	D	B	F	X	G	C	50	0	1	0		73	2511159	6010729
14	GREENWOOD ST			I	VOSPER ST	2452800	6/10/2004	Thu	1045	GE	VW1C	160A 387A		R	D	B	FF	T	N	C	50	0	0	0			2511159	6010729
15	GREENWOOD ST	110	E		WILKINSON ST	2711011	16/01/2007	Tue	1615	MC	CE1S	372B 503B 507B		R	D	B	F		N	C	50	0	0	1		86	2511295	6010728
16	GREY ST			I	GREEN LANE	2752370	15/05/2007	Tue	1730	MO	CS1C	309B 929		S	D	TN	F	D	N	C	50	0	0	0			2510246	6009852
17	GREY ST	50	S		PAH ST	2454323	8/10/2004	Tue	1430	MO	CS1CCC	420A		R	D	O	F		N	C	50	0	0	0			2510272	6010671
18	GREY ST			I	PAH ST	2552717	6/04/2005	Sat	1010	DB	CW2C	111A 131A	M	R	W	B	F	T	N	C	50	0	0	0			2510274	6010721
19	GREY ST	100	N		WHAKAREWA ST	2550970	3/11/2005	Fri	1700	GB	CN1C	158A 175B 929		R	D	B	F	D	N	C	50	0	0	0			2510256	6010253
20	HIGH ST SOUTH			I	BATCHELOR FORD RC	2653880	8/05/2006	Sat	U	CA	CS1	132A	P	R	D	B	F	X	G	C	70	0	0	0			2510451	6007530
21	HIGH ST SOUTH			I	WILDMAN ROAD	2751765	15/04/2007	Sun	1453	DA	CS1	111A 134A 402A	T	M	D	B	F	T	N	C	70	0	0	0			2510451	6007530
22	HURSTHOUSE ST			I	QUEEN VICTORIA ST	2650893	13/03/2006	Mon	1430	HA	VW1V	321A 375A		R	D	B	F	X	S	R	70	0	0	0			2509483	6007567
23	INGLIS ST			I	SAXON ST	2650479	13/02/2006	Mon	1215	HA	CE1V	302B 375B		R	D	B	F	X	G	C	50	0	0	0			2511171	6011029
24	INGLIS ST			I	VOSPER ST	2511257	15/02/2005	Tue	1705	HA	CE1S	302B 375B		R	D	B	F	X	G	C	50	0	0	1		13	2511171	6011029
25	INGLIS ST			I	VOSPER ST	2511821	5/09/2005	Mon	1220	HA	CE1V	302B 375B		R	D	B	F	X	G	C	50	0	0	1			2511171	6011029
26	KING EDWARD ST	50	E		QUEEN VICTORIA ST	2854439	29/08/2008	Fri	1500	EE	TW1C	374B 817	Q	R	D	O	F		N	C	50	0	0	0			2509604	6009196
27	KING EDWARD ST	90	E		QUEEN VICTORIA ST	2451315	4/07/2004	Wed	1800	KA	CE1C	308B 929		R	D	B	F	D	N	C	50	0	0	0			2509644	6009195
28	KING EDWARD ST	100	E		QUEEN VICTORIA ST	2711506	16/03/2007	Fri	1512	NA	CE1E	713B 726B		R	D	B	F		N	C	50	0	0	1	2		2509654	6009195
29	KING EDWARD ST	300	E		QUEEN VICTORIA ST	2650494	28/01/2006	Sat	U	DB	VW1	133A 929	F	R	D	B	F	D	N	C	50	0	0	0			2509854	6009187
30	KING EDWARD ST	800	E		QUEEN VICTORIA ST	2453292	17/06/2004	Thu	1250	GB	CW1V	158A 333A 929		R	W	O	F	D	N	C	50	0	0	0			2510353	6009167
31	KING EDWARD ST	70	W		SH 60	2854457	23/07/2008	Wed	1910	MG	CE1C	512B 927		R	D	DF	F	D	N	C	50	0	0	0			2510794	6009151
32	KING EDWARD ST	100	W		SH 60	2656559	29/12/2006	Fri	1130	CC	CW1	129A 137A	H	R	D	B	F		N	C	50	0	0	0			2510764	6009152
33	KING EDWARD ST	400	W		SH 60	2550156	1/08/2005	Sat	1600	EA	CE1C	129A 359A	M	R	D	B	F		N	C	50	0	0	0			2510464	6009163
34	KING EDWARD ST	800	W		SH 60	2413267	12/06/2004	Mon	1850	MD	CW1S	408B 929		R	D	B	F	D	N	C	50	0	0	1		6	2510064	6009179
35	MOFFATT ST	180	N		CLAY ST	2854065	8/09/2008	Sat	940	DA	CS1C	103A 111A	FM	E	D	B	F		N	N	50	0	0	0			2511529	6011003
36	MOTUEKA QUAY	100	N		OLD WHARF ROAD	2852478	15/05/2008	Thu	920	MO	4N1V	130A 385A 407A	EJM	R	D	B	F		N	N	50	0	0	0			2512051	6009195
37	MOUTERE HIGHW	400	S		HURSTHOUSE ST	2752549	27/05/2007	Sun	850	CB	TS1	501A	S	R	D	B	F		N	C	70	0	0	0			2509469	6007167

	Road	Distance	Direction	Intersection	Location	Reference	Date	Day	Time	Movement	Veh & Dirn	Causes	Object	Curve	Wet	Light	Weather	Junction	Control	Markings	Speed Limit	Fatal	Serious	Minor	Pedestrian	Cyclist	Easting	Northing
38	OLD WHARF ROAD	510	E		SH 60 HIGH	2813127	19/08/2008	Tue	546	PA	VW1E	370A 702B 860		R	D	DN	F		N	C	100	0	1	0	19		2511373	6009130
39	OLD WHARF ROAD	80	W		THORP ST	2450497	18/02/2004	Wed	2040	AD	VE1C	110A 431A 110B 431B	FPF	R	D	TN	F		N	C	50	0	0	0			2511605	6009120
40	OLD WHARF ROAD	200	W		THORP ST	2853754	7/05/2008	Sat	1530	MO	CE1	402A 800	D	R	D	B	F		N	C	50	0	0	0			2511485	6009126
41	PAH ST			I	ATKINS ST	2757354	26/12/2007	Wed	1345	DA	CW1	111A 402A 430A	K	R	D	B	F	T	N	C	50	0	0	0			2510209	6010699
42	PAH ST			I	QUEEN VICTORIA ST	2853454	7/04/2008	Fri	2345	DA	CW1	103A 131A	V	E	W	DO	L	X	G	C	50	0	0	0			2509610	6010515
43	PAH ST			I	QUEEN VICTORIA ST	2711082	27/01/2007	Sat	50	DB	CE1	103A 111A	FT	R	D	DF	F	X	G	C	50	0	0	1			2509610	6010515
44	PAH ST			I	SIMPSON ST	2713656	21/08/2007	Tue	1825	JA	PW1C	145A 301B 387B		R	D	DO	F	X	S	C	50	0	0	1			2510435	6010736
45	PAH ST			I	SIMPSON ST	2851026	15/03/2008	Sat	2336	DB	CN2	103A 111A	F	E	D	DO	F	X	G	C	50	0	0	0			2510435	6010736
46	POOLE ST			I	MICHAEL MYERS ST	2513219	24/11/2005	Thu	1232	JA	CE1T	303B 352B 817		R	W	O	L	T	N	C	50	0	0	3			2510714	6010956
47	POOLE ST	120	E		WILKIE ST	2413375	25/12/2004	Sat	1850	NB	CE1E	105B 713B		R	D	O	F		N	N	50	0	0	1	17		2510618	6010959
48	POOLE ST			I	WILKIE ST	2856650	14/12/2008	Sun	130	DA	CS2C	101A 111A	M	R	D	DO	F	T	N	N	50	0	0	0			2510498	6010964
49	QUEEN VICTORIA ST			I	COLLEGE ST	2752100	5/03/2007	Thu	1235	HA	CS1C	301A 375A		R	D	O	F	X	S	C	50	0	0	0			2509554	6009198
50	QUEEN VICTORIA	400	S		HAU ROAD	2412895	14/10/2004	Thu	1700	GC	CS1S	353B 372B 929		R	D	B	F	D	N	C	70	0	1	0		21	2509502	6007980
51	QUEEN VICTORIA ST			I	HAU ROAD	2855264	10/10/2008	Fri	2000	DA	CW2	111A	F	R	D	DN	F	T	G	C	80	0	0	0			2509518	6008379
52	QUEEN VICTORIA	400	S		KING EDWARD ST	2511349	26/02/2005	Sat	1335	GC	VS1P	333A 174B 387B		R	D	B	F		N	C	50	0	0	1			2509536	6008799
53	QUEEN VICTORIA ST			I	KING EDWARD ST	2654562	9/07/2006	Thu	930	HA	VN1C	321B		R	D	B	F	X	S	C	50	0	0	0			2509554	6009199
54	QUEEN VICTORIA ST			I	KING EDWARD ST	2654275	26/08/2006	Sat	1330	JA	CS1C	301B 375B		R	D	B	F	X	S	C	50	0	0	0			2509554	6009199
55	QUEEN VICTORIA ST			I	KING EDWARD ST	2655524	11/10/2006	Fri	1515	JA	CW2C	321A		R	D	B	F	X	S	C	50	0	0	0			2509554	6009199
56	QUEEN VICTORIA	100	N		PAH ST	2753056	17/06/2007	Sun	1755	DA	CN1	332A 860	F	M	D	DN	FF		N	N	50	0	0	0			2509612	6010615
57	QUEEN VICTORIA	280	N		PAH ST	2853928	8/03/2008	Sun	1700	DA	CS1	111A 134A 402A	FP	S	D	TN	F		N	N	50	0	0	0			2509726	6010733
58	QUEEN VICTORIA ST			I	PAH ST	2654943	10/03/2006	Tue	1830	DB	CW2	103A 131A	F	R	D	O	F	X	N	C	50	0	0	0			2509610	6010515
59	QUEEN VICTORIA ST			I	WHAKAREWA ST	2611070	15/01/2006	Sun	1730	KB	4S1C	302B 350B		R	D	B	F	X	G	C	50	0	0	1			2509594	6010175
60	QUEEN VICTORIA ST			I	WHAKAREWA ST	2750311	23/01/2007	Tue	1610	HA	CS1C	302B 375B		R	D	B	F	X	G	N	50	0	0	0			2509594	6010175
61	QUEEN VICTORIA ST			I	WHAKAREWA ST	2850758	24/02/2008	Sun	1247	HA	CW2C	302A		R	D	O	F	X	G	C	50	0	0	0			2509594	6010175
62	QUEEN VICTORIA ST			I	WHAKAREWA ST	2553017	18/06/2005	Sat	1900	HA	CN1V	302B		R	D	DO	F	X	G	C	50	0	0	0			2509594	6010175
63	QUEEN VICTORIA	200	N		WILDMAN ROAD	2811872	5/02/2008	Fri	1725	CB	PN1	129A 350A 402A	T	R	D	TN	F		N	C	50	0	0	1			2509493	6007766
64	SIMPSON ST	30	S		PAH ST	2753318	6/10/2007	Sun	40	CB	CN1	133A	F	R	D	DO	FF		N	N	50	0	0	0			2510434	6010706
65	STAPLES ST	400	E		THORP ST	2852473	14/05/2008	Wed	1645	DA	CW1	131A 400A 430A	V	S	D	O	F		N	N	50	0	0	0			2512194	6011819
66	TAYLOR AVENUE	30	S		TUDOR ST	2654823	20/09/2006	Wed	2350	DA	CN1	101A 195A	F	E	D	DO	F		N	N	50	0	0	0			2511168	6010361
67	THORP ST			I	ADAIR DRIVE	2713182	15/09/2007	Sat	2146	EA	CN1C	129A 351A	M	R	D	DO	F	T	G	C	50	0	0	1			2511755	6010855
68	THORP ST	10	N		FEARON ST	2450425	2/01/2004	Sun	600	CB	CN1	131A 358A	V	R	W	ON	H	T	N	N	100	0	0	0			2511771	6011249
69	THORP ST			I	GREENWOOD ST	2556443	12/07/2005	Wed	1745	JA	VN1C	104B 302B		R	D	B	F	T	G	C	50	0	0	0			2511750	6010724
70	THORP ST			I	KRAMMER ST	2752451	15/05/2007	Tue	1635	LB	CS1C	303B 375B		R	D	B	F	T	G	C	50	0	0	0			2511746	6010631
71	THORP ST			I	KRAMMER ST	2653881	20/04/2006	Thu	1301	JA	CS1C	110A 132A		R	D	B	F	T	G	C	50	0	0	0			2511746	6010631
72	THORP ST	30	S		PETHYBRIDGE ST	2757193	17/12/2007	Mon	1400	CC	CN1	357A 512A	F	R	D	B	F		N	C	50	0	0	0			2511760	6010970
73	THORP ST			I	TUDOR ST	2656434	29/12/2006	Fri	1925	JA	CN14	302B 375B		R	D	B	F	T	G	C	50	0	0	0			2511736	6010371
74	THORP ST			I	TUDOR ST	2711779	24/01/2007	Wed	1140	JC	CN2S	302A		R	D	B	F	T	G	C	50	0	0	1		46	2511736	6010371
75	TREWAVAS ST	350	N		EVERETT ST	2512627	29/08/2005	Mon	1430	QG	CN1E	663A		R	D	B	F		N	C	50	0	0	1	49		2511837	6008247
76	TREWAVAS ST	250	N		WHARF ROAD	2550298	17/02/2005	Thu	1500	MD	CS1C	386B 929	M	R	D	B	F	D	N	C	50	0	0	0			2511838	6008148
77	TUDOR ST	15	E		SH 60	2850279	29/01/2008	Tue	1510	MA	CE1V	373B 671B		R	D	B	F		N	C	50	0	0	0			2510924	6010399
78	TUDOR ST	20	E		SH 60	2513104	17/10/2005	Mon	1030	PC	CN1	371A 925		R	D	B	F	D	N	C	50	0	0	1	95		2510929	6010398
79	TUDOR ST			I	THORP ST	2656401	19/12/2006	Tue	1800	CC	CW1	133A 632A	K	R	D	B	F	X	G	N	50	0	0	0			2511736	6010371
80	TUDOR ST	60	E		WILKINSON ST	2854114	17/08/2008	Sun	200	CB	VE1	103A	F	R	W	DO	FF		N	C	50	0	0	0			2511232	6010388

	Road	Distance	Direction	Intersection	Location	Reference	Date	Day	Time	Movement	Veh & Dirn	Causes	Object	Curve	Wet	Light	Weather	Junction	Control	Markings	Speed Limit	Fatal	Serious	Minor	Pedestrian	Cyclist	Easting	Northing
81	VOSPER ST			I	INGLIS ST	2850944	3/10/2008	Mon	1200	DA	400	124A	IS	R	D	O	F	X	G	R	50	0	0	0			2511171	6011029
82	WALLACE ST	60	E		SH 60	2612182	16/06/2006	Fri	1308	CB	CE1C	137A		R	D	B	F		N	C	50	0	0	1			2510975	6010532
83	WALLACE ST	20	W		WILKINSON ST	2854814	17/09/2008	Wed	1235	GD	CE1V	181A 926		R	W	O	L	D	N	C	50	0	0	0			2511160	6010524
84	WHAKAREWA ST			I	COPPINS PLACE	2711267	27/02/2007	Tue	1845	JA	CW1C	309B		R	D	B	F	T	N	C	50	0	0	1			2510774	6010134
85	WHAKAREWA ST			I	GREY ST	2757116	12/07/2007	Fri	1435	HA	CW1C	302B 353B 375B		R	D	B	F	X	G	C	50	0	0	0			2510258	6010154
86	WHAKAREWA ST	20	E		NAUMAI ST	2754776	22/08/2007	Wed	1040	GD	4W1C	181A 333A 927		R	D	B	F	D	N	C	50	0	0	0			2510813	6010132
87	WHAKAREWA ST			I	NAUMAI ST	2855265	10/12/2008	Sun	1315	GD	TW1C4	331A		R	D	B	F	T	N	C	50	0	0	0			2510793	6010133
88	WHAKAREWA ST	40	W		PAMARIKA ST	2651129	25/03/2006	Sat	1344	CC	CE1	103A 112A 130A	FP	R	D	B	F		N	N	50	0	0	0			2508904	6010197
89	WHAKAREWA ST	50	W		PAMARIKA ST	2653023	28/06/2006	Wed	1100	CB	CN1	135A 802	F	R	I	B	FF		N	N	100	0	0	0			2508894	6010197
90	WHAKAREWA ST			I	QUEEN VICTORIA ST	2553014	27/06/2005	Mon	1005	JA	CE1C	302A 375A		R	D	B	F	X	G	C	50	0	0	0			2509594	6010175
91	WHAKAREWA ST			I	QUEEN VICTORIA ST	2650577	2/06/2006	Mon	1830	FB	CE1C	103A 331A		R	D	B	F	X	G	C	50	0	0	0			2509594	6010175
92	WHAKAREWA ST			I	QUEEN VICTORIA ST	2713080	9/12/2007	Wed	1600	HA	CN2CC	302B		R	D	B	F	X	G	C	50	0	1	2			2509594	6010175
93	WHAKAREWA ST	10	W		SH 60	2613268	21/11/2006	Tue	1515	NB	4W1E	713B		R	D	B	F	T	G	C	50	0	0	1	10		2510890	6010127
94	WHARF ROAD	200	W		EVERETT ST	2411145	1/09/2004	Fri	1200	AF	CW1S	130B 903		R	D	B	S		N	C	100	0	0	1		18	2511606	6007944
95	WHARF ROAD	300	W		EVERETT ST	2852837	25/05/2008	Sun	1430	AA	SW1C	128A 198A		R	D	B	F		N	C	100	0	0	0			2511510	6007971
96	WHARF ROAD	300	W		WARD ST	2713369	17/10/2007	Wed	1045	CC	CW1	103A 359A	Z	R	D	O	F		N	C	100	0	1	0			2511415	6007998
97	WHARF ROAD			I	WARD ST	2711211	2/09/2007	Fri	2040	KA	CW1C	103A 302A	T	R	D	DO	F	Y	G	C	100	0	0	2			2511703	6007916
98	WILDMAN ROAD	800	W		HIGH ST SOUTH	2511269	24/02/2005	Thu	1850	GC	VE1S	371B		R	D	B	F		N	C	70	0	0	1		11	2509652	6007562
99	WILDMAN ROAD			I	MOUTERE HIGHWAY	2754257	8/05/2007	Sun	850	DA	CN2	124A 360A 902	IS	R	W	B	L	X	S	R	70	0	0	0			2509484	6007567
100	WILKINSON ST	50	S		GREENWOOD ST	2851951	5/02/2008	Fri	1500	MO	CE1C	371A 507A	M	R	D	B	F		N	C	50	0	0	0			2511183	6010679
101	WOODLAND AVEN	100	E		HIGH ST	2611961	19/05/2006	Fri	1930	AF	CS1S	150A 386A 105B		M	D	DO	F		N	C	50	0	0	1		20	2510983	6010091
102	Z CPK BNZ			A	SH 60	2455149	21/10/2004	Thu	1555	MO	VS1C	370A 371B		R	D	B	F		N	N	50	0	0	0			2510967	6010473
103	Z CPK DECKS RESERVE			A	GREENWOOD ST	2412611	9/10/2004	Fri	127	NA	CN1E	507B 711B 926		R	D	O	F	D	N	N	50	0	0	1	72		2511011	6010704
104	Z CPK DECKS RES	50	E		GREENWOOD/SH 60	2851150	27/03/2008	Thu	1200	MO	VE1CC	386A 400A	M	R	W	O	L		N	N	50	0	0	0			2511052	6010670
105	Z CPK DECKS RES	50	E		GREENWOOD/SH 60	2811508	16/03/2008	Sun	1142	MO	CN1V	133A 507A	MP	R	D	B	F		N	N	50	0	0	1			2511063	6010666
106	Z CPK FRESH CHO	50	E		PAH/HIGH	2454548	24/09/2004	Fri	1810	MO	CS1C	371A 925	M	R	D	B	F	D	N	N	50	0	0	0			2510864	6010719
107	Z CPK PARKER PA	200	W		KING EDWARD/SH 60	2654027	31/07/2006	Mon	1000	MO	CN1V	371A	M	R	D	B	F		N	N	50	0	0	0			2510664	6009155
108	Z CPK POLICE STA	80	N		SH 60/POOLE ST	2450936	2/12/2004	Thu	1505	MO	CN1C	371A		R	D	B	F		N	N	50	0	0	0			2510819	6010994
109	Z CPK SWAN HOT	20	W		WHAKAREWA/SH 60	2552066	5/10/2005	Tue	940	MO	CS1C	371A		R	D	B	F	D	N	N	50	0	0	0			2510879	6010130
110	Z CPK TALLIES			A	PATTIE ST	2554466	9/05/2005	Mon	615	MO	CW1CCC	501A	M	R	D	DF	F		N	N	50	0	0	0			2511831	6007780
111	Z CPK WAREHOUS	120	N		SH 60/WOODLAND AVI	2556025	12/06/2005	Tue	1045	MO	VW1V	386A	M	R	D	B	F		N	N	50	0	0	0			2510922	6010180
112	Z DWAY #5	100	S		TALBOT/PAH	2512466	28/07/2005	Thu	1540	PO	CS1E	371A 929		R	W	O	L	D	N	N	50	0	0	1	92		2510718	6010634
113	Z FCT SHELL	200	N		HIGH/WHAKAREWA ST	2450627	2/09/2004	Mon	2330	DB	CW1	104A 385A 922	X	R	D	DO	F	D	N	N	50	0	0	0			2510923	6010280
114	Z KFC DRIVE THRU			A	SH 60	2412910	14/10/2004	Thu	1800	FD	CW1V	350A 423A		R	D	B	F		N	N	50	0	0	1			2510943	6010364
115	Z MOTUEKA BEACH			A	OLD WHARF/MOTUEKA	2750394	21/01/2007	Sun	1730	MO	CE1C	371A	M	R	D	B	F		N	N	50	0	0	0			2512093	6009128
116	Z SERVICE ALLEY	70	N		SH 60/GREENWOOD	2611564	30/03/2006	Thu	215	NA	CW1E	105B 711B		R	D	DO	F		N	N	50	0	1	0	26		2510913	6010805
117	60//0			I	WHAKAREWA ST	2550612	15/02/2005	Tue	1340	FB	CE2T	331A		R	D	B	F	T	S	P	50	0	0	0			2510899	6010122
118	60/17/15.195			I	HIGH ST SOUTH	2613338	17/12/2006	Sun	1300	HA	CN1C	302A 507A		E	D	B	F	R	G	R	50	0	0	1			2510820	6008161
119	60/17/15.195			I	WHARF ROAD	2411400	28/02/2004	Sat	1115	HA	CN1C	302A 427A		E	W	O	H	X	G	R	50	0	0	2			2510820	6008161
120	60/17/15.195			I	WHARF ROAD	2855081	9/06/2008	Sat	2100	DC	CW2	101A 110A 335A	IX	R	D	DO	F	R	G	R	50	0	0	0			2510820	6008161
121	60/17/15.195			I	WHARF ROAD	2650183	22/01/2006	Sun	345	DA	CS1	103A 113A 131A		E	D	DO	F	R	G	R	50	0	0	0			2510820	6008161
122	60/17/15.395	200	N		WHARF ROAD	2757194	18/12/2007	Tue	945	LB	CN1C	145A 303B 387B 507B 927		R	W	O	L	D	N	P	50	0	0	0			2510828	6008361
123	60/17/15.815	150	N		COURTNEY ST	2653252	14/07/2006	Fri	1415	FC	TN1C	191A 331B 352B		R	D	B	F		N	X	50	0	0	0			2510843	6008780

	Road	Distance	Direction	Intersection	Location	Reference	Date	Day	Time	Movement	Veh & Dirn	Causes	Object	Curve	Wet	Light	Weather	Junction	Control	Markings	Speed Limit	Fatal	Serious	Minor	Pedestrian	Cyclist	Easting	Northing
124	60/17/15.983	200	S		KING EDWARD ST	2812592	13/07/2008	Sun	1555	BE	CN1C	410A		R	D	B	F		N	C	50	0	0	2			2510852	6008948
125	60/17/16.183			I	KING EDWARD ST	2413430	30/12/2004	Thu	1200	JA	TN1C	301B 353B		R	W	O	H	X	S	C	50	0	0	1			2510864	6009148
126	60/17/16.183			I	KING EDWARD ST	2650232	2/02/2006	Thu	1400	LB	CN1V	303B		R	D	B	F	X	N	C	50	0	0	0			2510864	6009148
127	60/17/16.183			I	KING EDWARD ST	2455656	13/11/2004	Sat	1230	KC	VN1C	305A		R	W	O	L	X	G	R	50	0	0	0			2510864	6009148
128	KING EDWARD ST			I	60/33/0	2850524	15/02/2008	Fri	1600	FB	VE1C	353A 387A		R	W	O	L	X	G	C	50	0	0	0			2510864	6009148
129	OLD WHARF ROAD			I	60/33/0	2813596	12/08/2008	Mon	1630	GF	TW1C	158B 333B		R	W	O	L	X	S	C	50	0	0	1			2510864	6009148
130	60/33/0			I	KING EDWARD ST	2751912	4/02/2007	Mon	1510	FB	CE2M	386A		E	D	B	F	X	S	C	50	0	0	0			2510864	6009148
131	60/33/0			I	OLD WHARF ROAD	2611951	20/05/2006	Sat	1525	JA	VS1C	302B 375B		R	D	B	F	R	G	R	50	0	0	2			2510864	6009148
132	60/33/0			I	OLD WHARF ROAD	2851513	4/10/2008	Thu	1633	HA	VS1CC	301B 404B		R	D	B	F	X	S	C	50	0	0	0			2510864	6009148
133	60/33/0.165	40	S		MONAHAN ST	2451085	24/03/2004	Wed	1330	MC	CN1C	352B 372B		R	D	O	F		N	C	50	0	0	0			2510871	6009312
134	60/33/0.205			I	MONAHAN ST	2754388	8/12/2007	Sun	2030	GD	CN1C	333A 411A		R	D	DO	F	T	G	C	50	0	0	0			2510871	6009352
135	60/33/0.4	400	N		KING EDWARD ST	2850558	15/02/2008	Fri	1710	FD	CN1T	112A 331A		R	W	O	L		N	C	50	0	0	0			2510878	6009548
136	60/33/0.482	60	S		WRATT ST	2650111	14/01/2006	Sat	1030	GB	CN1C	158A 333A 175B 929		R	D	B	F	D	N	C	50	0	0	0			2510882	6009630
137	60/33/0.542			I	WRATT ST	2513473	26/12/2005	Mon	1115	FD	CN1C	181A		R	D	B	F	T	G	C	50	0	0	1			2510884	6009690
138	60/33/0.542			I	WRATT ST	2451487	27/04/2004	Tue	850	JA	VN1C	302B 375B		R	W	O	H	T	G	C	50	0	0	0			2510884	6009690
139	60/33/0.592	50	N		WRATT ST	2852630	28/05/2008	Wed	1845	EA	4N14	350A 370A	M	R	D	DO	F		N	C	50	0	0	0			2510886	6009740
140	60/33/0.739	20	N		LOWE ST	2555460	11/07/2005	Mon	1620	GE	CS1C	181A 387A 144B 372B 927		R	D	B	F	D	N	C	50	0	0	0			2510891	6009886
141	60/33/0.825	150	S		WOODLAND AVENUE	2450044	1/02/2004	Fri	1320	FD	CN1CCC	181A 331A		R	D	B	F		N	C	50	0	0	0			2510895	6009972
142	60/33/0.859	140	N		LOWE ST	2750556	20/02/2007	Tue	1100	EA	CN1C	129A 402A	M	R	D	B	F		N	C	50	0	0	0			2510896	6010006
143	60/33/0.925	50	S		WHAKAREWA ST	2853004	18/06/2008	Wed	1830	CB	CN1	504A	F	R	D	DO	F		N	C	50	0	0	0			2510899	6010072
144	60/33/0.925	50	S		WHAKAREWA ST	2650027	1/05/2006	Thu	1530	FD	4N1C	135A 181A 801		R	W	O	L		N	C	50	0	0	0			2510899	6010072
145	60/33/0.945	30	S		WHAKAREWA ST	2453500	28/07/2004	Wed	1615	KA	CN1C	308B 375B 929		R	W	O	H	D	N	C	50	0	0	0			2510900	6010092
146	60/33/0.975			I	WHAKAREWA ST	2852315	20/05/2008	Tue	1550	GF	CE2T	387A 175B		R	D	O	F	X	G	C	50	0	0	0			2510899	6010122
147	60/33/0.975			I	WHAKAREWA ST	2850757	3/01/2008	Sat	1050	KB	CS1C	302B 375B		R	W	O	H	X	G	C	50	0	0	0			2510899	6010122
148	60/33/0.975			I	WHAKAREWA ST	2512893	27/09/2005	Tue	1700	JA	CN1C	302B		R	D	O	F	X	G	C	50	0	0	1			2510899	6010122
149	60/33/0.975			I	WHAKAREWA ST	2453592	30/07/2004	Fri	1610	LB	CN1C	303B 387B		R	W	O	L	X	G	C	50	0	0	0			2510899	6010122
150	60/33/0.975			I	WOODLANDS AVENUE	2613467	12/10/2006	Sun	1340	JO	CW24	102A 309A		R	D	B	F	T	G	L	50	0	0	1			2510899	6010122
151	60/33/1.075	100	N		WHAKAREWA ST	2811822	26/04/2008	Sat	730	KB	CS1C	308B 370B 922		R	D	O	F	D	N	P	50	0	0	1			2510902	6010222
152	60/33/1.095	120	N		WOODLAND AVENUE	2556406	27/12/2005	Tue	800	LB	TS1C	303B 375B 404B 925		R	D	B	F	D	G	R	50	0	0	0			2510903	6010242
153	60/33/1.102	150	S		TUDOR ST	2451451	3/05/2004	Fri	1305	BB	CE1C	124A 387A 922		R	D	B	F	D	N	P	50	0	0	0			2510904	6010250
154	60/33/1.252			I	TUDOR ST	2511832	19/04/2005	Tue	1600	NB	VS1K	306A 312B 386B		R	D	B	F	T	G	X	50	0	0	1	24		2510909	6010399
155	60/33/1.253			I	TUDOR ST	2451276	3/04/2004	Thu	1230	GF	VW2C	175A 355A		R	D	B	F	T	G	C	50	0	0	0			2510909	6010399
156	60/33/1.292	40	N		TUDOR ST	2851998	23/04/2008	Wed	900	MO	CN1C	371A		R	D	B	F		N	C	50	0	0	0			2510911	6010439
157	60/33/1.302	50	N		TUDOR ST	2757346	13/12/2007	Thu	1220	MO	VN1C	386A		R	D	B	F		N	C	50	0	0	0			2510911	6010449
158	60/33/1.358	30	S		WALLACE ST	2750642	2/07/2007	Wed	1515	MO	CW14	371A 927		R	D	B	F	D	N	C	50	0	0	0			2510914	6010505
159	60/33/1.368	20	S		WALLACE ST	2556447	19/12/2005	Mon	1530	MO	VN1C	385A	M	R	D	O	F		N	C	50	0	0	0			2510914	6010515
160	60/33/1.373	15	S		WALLACE ST	2757672	18/12/2007	Tue	1730	MO	CN14	386A	M	R	W	TF	L		N	C	50	0	0	0			2510914	6010520
161	60/33/1.384	200	S		GREENWOOD ST	2851534	17/04/2008	Thu	1350	MO	VN1C	386A		R	D	O	F		N	C	50	0	0	0			2510915	6010531
162	60/33/1.413	25	N		WALLACE ST	2411029	20/01/2004	Tue	955	FC	CS1CE	331A		R	D	B	F		N	X	50	0	0	1	65		2510916	6010560
163	60/33/1.418	30	N		WALLACE ST	2551981	23/03/2005	Wed	1400	EA	VN1C	129A 386A	M	R	D	B	F		N	C	50	0	0	0			2510916	6010565
164	60/33/1.418	30	N		WALLACE ST	2752130	1/06/2007	Sat	1610	FC	CN1V	331A		R	D	B	F		N	X	50	0	0	0			2510916	6010565
165	60/33/1.504	80	S		GREENWOOD ST	2751702	15/04/2007	Sun	1818	MO	4N1	370A		R	D	TF	F		N	C	50	0	0	0			2510919	6010651
166	60/33/1.554	30	S		GREENWOOD ST	2550191	21/01/2005	Fri	1325	FC	CS1C	181A		R	D	O	F		N	X	50	0	0	0			2510921	6010701

	Road	Distance	Direction	Intersection	Location	Reference	Date	Day	Time	Movement	Veh & Dirn	Causes	Object	Curve	Wet	Light	Weather	Junction	Control	Markings	Speed Limit	Fatal	Serious	Minor	Pedestrian	Cyclist	Easting	Northing
167	60/33/1.584			I	GREENWOOD ST	2455695	11/07/2004	Sun	1610	HA	CN1C	302B		R	D	B	F	X	G	C	50	0	0	0			2510923	6010731
168	60/33/1.584			I	PAH ST	2711680	4/07/2007	Sat	1030	NB	CE2E	713B 727B		R	D	B	F	T	G	R	50	0	0	1	5		2510923	6010731
169	60/33/1.584			I	PAH ST	2711625	4/05/2007	Thu	1146	NF	CS1E	370A 671A		R	D	B	F	X	N	C	50	0	1	0	82		2510923	6010731
170	60/33/1.584			I	PAH ST	2651917	5/10/2006	Wed	1555	LB	CW2C	302B 302		R	D	B	F	X	G	R	50	0	0	0			2510923	6010731
171	60/33/1.584			I	PAH ST	2450992	3/01/2004	Mon	1050	NB	VN1E	376A		R	D	B	F	X	N	C	50	0	0	0			2510923	6010731
172	60/33/1.584			I	PAH ST	2554942	23/09/2005	Fri	1630	NA	CN1E	713B 726B		R	D	B	F	X	N	C	50	0	0	0			2510923	6010731
173	60/33/1.584			I	PAH ST	2711928	17/05/2007	Thu	710	LB	MN1C	303B		R	D	TO	F	X	G	R	50	0	0	1			2510923	6010731
174	60/33/1.585			I	GREENWOOD ST	2654941	21/10/2006	Sat	850	HA	VW2V	302A 375A		R	D	B	F	X	G	C	50	0	0	0			2510923	6010731
175	60/33/1.585			I	GREENWOOD ST	2856693	27/12/2008	Sat	945	FD	CS1C	331A 352A		R	D	B	F	X	N	C	50	0	0	0			2510923	6010731
176	60/33/1.599	15	N		GREENWOOD ST	2411787	29/04/2004	Thu	850	EE	SS1CV	137A 374B	M	R	D	O	F		N	C	50	0	0	1		77	2510923	6010746
177	60/33/1.634	50	N		GREENWOOD ST	2650555	1/05/2006	Thu	1300	MO	4W1C	371A 926		R	D	B	F	D	N	C	50	0	0	0			2510925	6010781
178	60/33/1.634	50	N		PAH ST	2752346	16/05/2007	Wed	1730	MA	CN1V	382B		R	D	DO	F		N	C	50	0	0	0			2510925	6010781
179	60/33/1.721	80	S		POOLE ST	2612812	16/07/2006	Sun	1645	BE	CS14	410A		R	W	B	F		N	C	50	0	1	2			2510928	6010867
180	60/33/1.751	50	S		POOLE ST	2751911	28/04/2007	Sat	1655	JA	MN1C	308B 378B 839 923		R	D	O	F	D	N	C	50	0	0	0			2510929	6010897
181	60/33/1.752	500	N		TUDOR ST	2452406	19/05/2004	Wed	1000	MO	VN1S	371A	M	R	D	B	F		N	C	50	0	0	0			2510929	6010899
182	60/33/1.761	40	S		POOLE ST	2653175	23/06/2006	Fri	1820	JA	CN1V	308B 377B 839 923		R	D	DO	F	D	N	C	50	0	0	0			2510929	6010907
183	60/33/1.781	20	S		POOLE ST	2654824	21/09/2006	Thu	1000	GB	CN1T	158A 387A 604B 927		R	D	B	F	D	N	P	50	0	0	0			2510930	6010927
184	60/33/1.796	5	S		POOLE ST	2857033	31/12/2008	Wed	1430	FA	CN1C	331A 387A		R	D	B	F	T	N	C	50	0	0	0			2510931	6010942
185	60/33/1.801			I	POOLE ST	2654940	22/10/2006	Sun	1210	JA	CN1C	302B		R	W	O	L	X	G	C	50	0	0	0			2510931	6010947
186	60/33/1.801			I	POOLE ST	2552189	19/05/2005	Thu	1645	KA	VN1C	308A 375A		S	D	B	F	T	N	C	50	0	0	0			2510931	6010947
187	60/33/1.801			I	POOLE ST	2611180	16/02/2006	Thu	1125	CA	MN1VC	137A 197A	M	R	D	B	F	T	G	C	50	0	0	1			2510931	6010947
188	60/33/1.893			I	INGLIS ST	2450754	23/01/2004	Fri	1720	MG	BW2C	371B 386B		R	D	O	F	T	G	C	50	0	0	0			2510934	6011039
189	60/33/1.943	50	N		INGLIS ST	2611090	29/01/2006	Sun	1700	NA	VN1	507B 710B		R	D	B	F		N	N	50	0	0	1	88		2510936	6011089
190	60/33/1.965			I	EGINTON ST	2450574	2/11/2004	Wed	1710	DA	CS1	358A	P	R	D	B	F	T	G	C	50	0	0	0			2510937	6011111
191	60/33/1.965			I	EGINTON ST	2756146	24/10/2007	Wed	1528	KB	CS1C	302B 382B		R	D	B	F	T	G	C	50	0	0	0			2510937	6011111
192	60/33/2.005	40	N		EGINTON ST	2513054	10/07/2005	Fri	1255	GC	CN14	372B 929		R	D	B	F	D	N	C	50	0	0	2			2510940	6011151
193	60/33/2.012	200	S		FEARON ST	2855850	11/12/2008	Wed	1530	MC	CS1C	372B		R	D	B	F		N	C	50	0	0	0			2510940	6011159
194	60/33/2.152	60	S		PARKER ST	2652828	19/06/2006	Mon	1615	GD	CS1C	333A 101B 929		R	D	B	F	D	N	C	50	0	0	0			2510949	6011298
195	60/33/2.212			I	PARKER ST	2453926	30/07/2004	Fri	2350	DB	VE2	101A 111A		R	W	DO	F	T	G	C	50	0	0	0			2510952	6011358
196	60/33/2.242	30	N		PARKER ST	2756382	21/10/2007	Sun	1115	MC	CN14	300B 372B		R	D	B	F		N	P	50	0	0	0			2510954	6011388
197	60/33/2.33	400	S		STAPLES ST	2853749	7/12/2008	Sat	710	EC	VS1	370A 645A	X	R	W	DN	L		N	C	50	0	0	0			2510959	6011476
198	60/33/2.43	1200	S		MOTUEKA BR S	2412387	8/04/2004	Wed	2127	DB	CS1	111A 131A	FMT	E	W	DO	H		N	C	100	0	0	1			2510980	6011572
199	60/33/2.73			I	STAPLES ST	2754397	8/12/2007	Sun	1947	BA	4S1C	103A 359A		R	W	DO	L	T	G	C	100	0	0	0			2511027	6011862
200	60/33/2.78	50	N		STAPLES ST	2756688	23/11/2007	Fri	1630	FD	CN1CC	181A		E	D	B	F		N	C	100	0	0	0			2511023	6011912

Moutueka Transportation Study Crash Analysis [2004-2008]

Number of records = 200

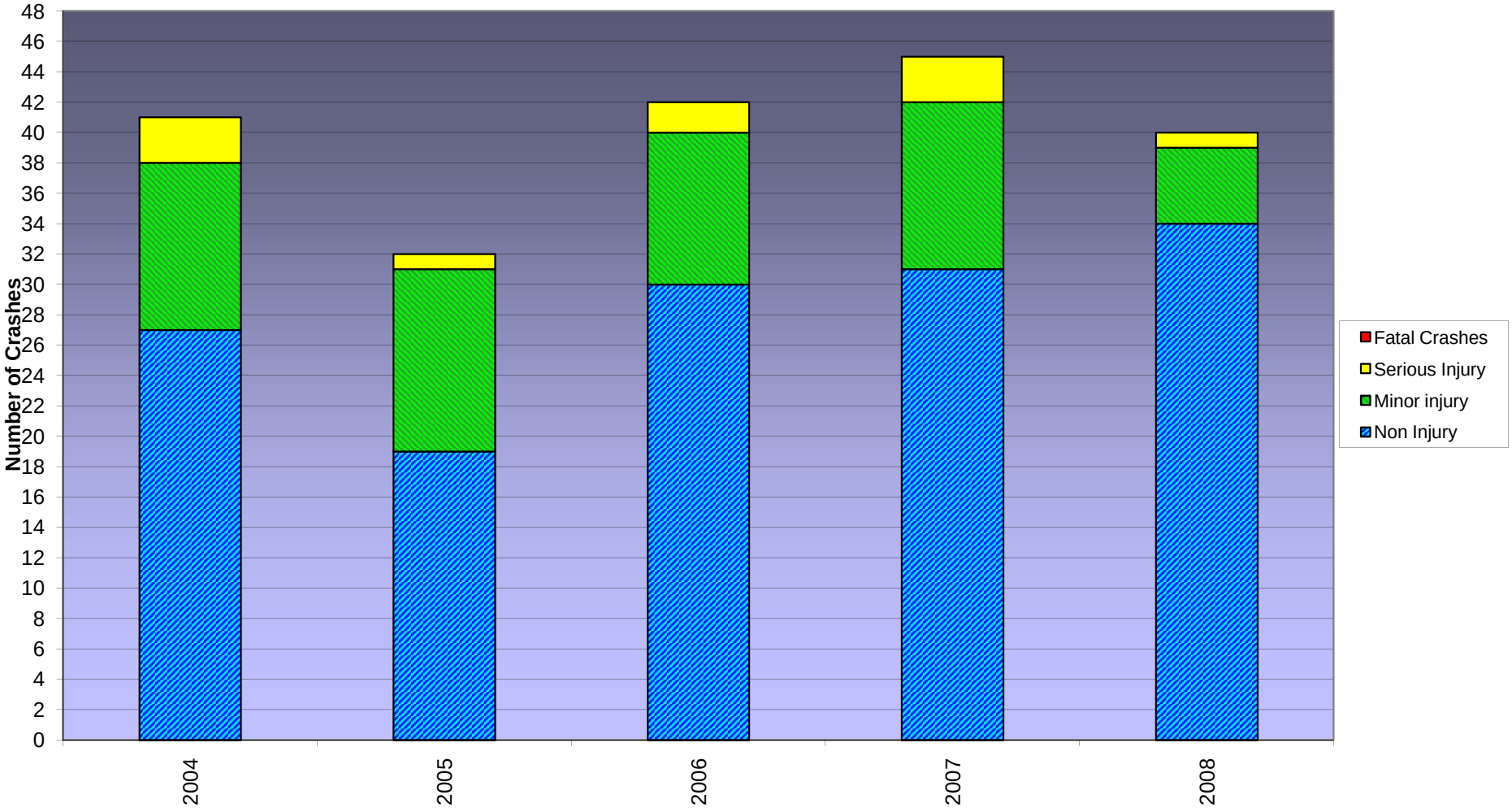
ANALYSIS OF FACTORS ASSOCIATED WITH CRASHES

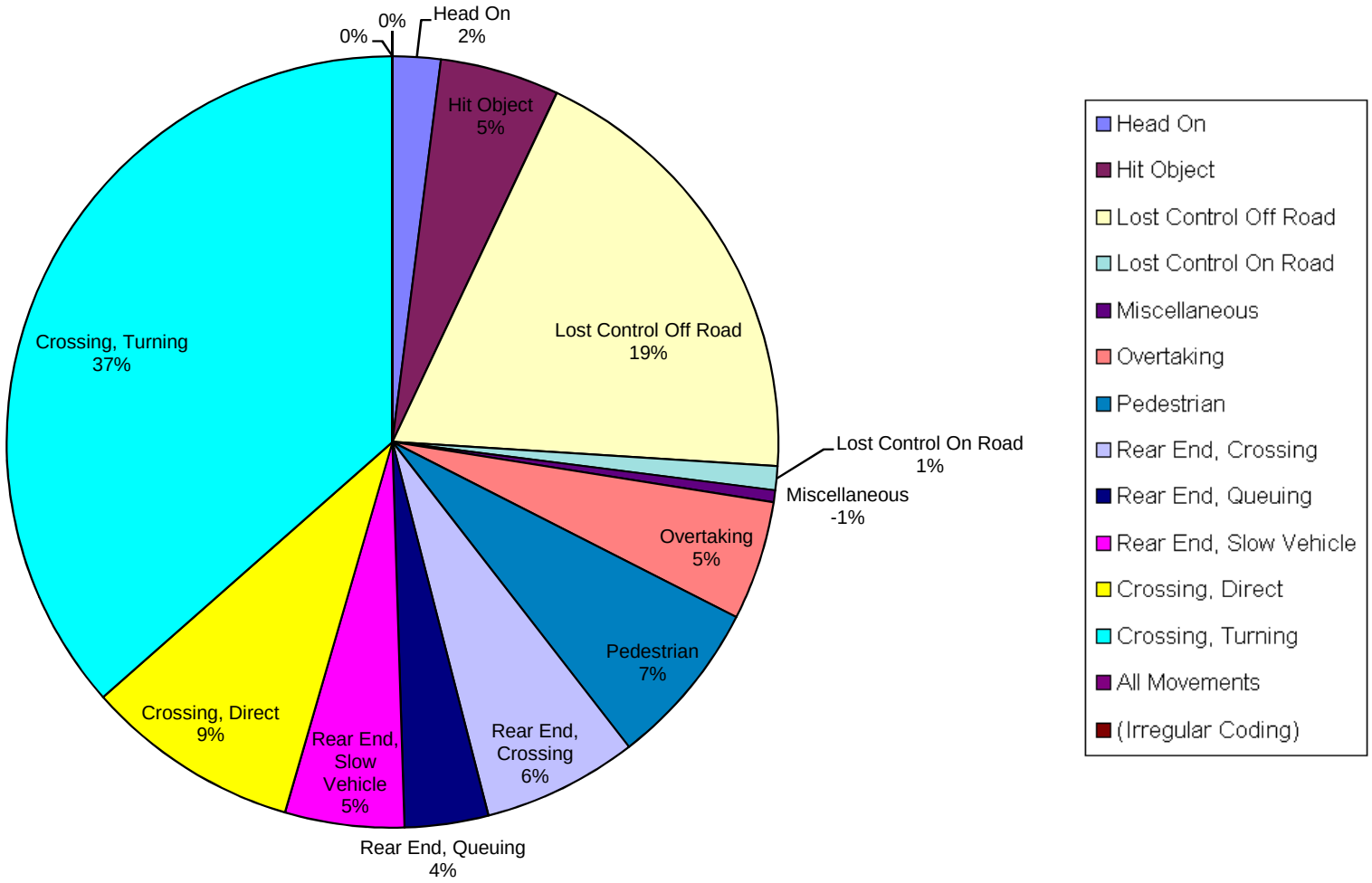
Year			Month			Day			Time of Accident			Movement Type			Direction of Travel			Curve Type			Wetness			Object(s) Struck (up to 3)		
Value	*Freq*	*%*	*Value*	*Freq*	*%*	*Value*	*Freq*	*%*	*Value*	*Freq*	*%*	*Value*	*Freq*	*%*	*Value*	*Freq*	*%*	*Value*	*Freq*	*%*	*Value*	*Freq*	*%*	*Value*	*Freq*	*%*
2004	41	21	1	18	9	MON	23	12	0	0	0	A	5	3		0	0	R	183	92	D	170	85	A	0	0
2005	32	16	2	20	10	TUE	29	15	100	3	2	B	4	2	North	71	36	E	10	5	W	29	15	B	2	3
2006	42	21	3	14	7	WED	32	16	200	3	2	C	16	8	South	44	22	M	3	2	I	1	1	C	0	0
2007	45	23	4	17	9	THU	31	16	300	1	1	D	23	12	East	34	17	S	4	2				D	1	1
2008	40	20	5	23	12	FRI	31	16	400	1	1	E	10	5	West	50	25							E	1	1
2009	0	0	6	14	7	SAT	27	14	500	0	0	F	16	8										F	19	24
2010	0	0	7	19	10	SUN	27	14	600	2	1	G	20	10										G	0	0
2011	0	0	8	10	5				700	1	1	H	18	9										H	1	1
2012	0	0	9	12	6				800	5	3	J	20	10										I	3	4
2013	0	0	10	21	11				900	6	3	K	9	5										J	1	1
2014	0	0	11	6	3				1000	11	6	L	9	5										K	2	3
2015	0	0	12	26	13				1100	14	7	M	35	18										L	0	0
2026	0	0							1200	13	7	N	11	6										M	26	33
2027	0	0							1300	15	8	O	0	0										N	0	0
2028	0	0							1400	18	9	P	3	2										O	0	0
2029	0	0							1500	11	6	Q	1	1										P	6	8
2030	0	0							1600	23	12													Q	1	1
2031	0	0							1700	23	12													R	0	0
2032	0	0							1800	18	9													S	3	4
2033	0	0							1900	14	7													T	5	6
2034	0	0							2000	5	3													U	0	0
2035	0	0							2100	4	2													V	3	4
2036	0	0							2200	2	1													W	0	0
2037	0	0							2300	0	0													X	3	4
2038	0	0							2400	5	3													Y	0	0
2039	0	0							U	2	1													Z	1	1
	200	100		200	100		200	100		200	100		200	100		199	99.5		200	100		200	100		78	100

Grid Ref Box: Easting 2508177 to 2512194
Northing 6007167 to 6011912

Light			Weather			Junction			Control			Markings			Speed Limit			Accident Types			Pedestrian Age			Cyclist Age		
Value	*Freq*	*%*	*Value*	*Freq*	*%*	*Value*	*Freq*	*%*	*Value*	*Freq*	*%*	*Value*	*Freq*	*%*	*Value*	*Freq*	*%*	*Value*	*Freq*	*%*	*Value*	*Freq*	*%*	*Value*	*Freq*	*%*
B	120	60	F	169	85		75	38		0	0	X	5	3	30	0	0	F	0	0	0	0	0	0	0	0
BO	0	0	FF	5	3	D	36	18	T	0	0	R	13	7	50	175	88	S	10	5	4	1	1	4	0	0
BF	0	0	FS	0	0	M	0	0	S	15	8	P	6	3	60	0	0	M	49	25	8	1	1	8	1	1
BN	0	0	M	0	0	R	4	2	G	58	29	L	1	1	70	10	5	N	141	71	12	1	1	12	1	1
BU	0	0	MF	0	0	T	34	17	M	0	0	C	143	72	80	1	1		200	100	16	0	0	16	1	1
O	41	21	MS	0	0	X	50	25	P	0	0	N	32	16	90	0	0				20	2	1	20	2	1
OO	0	0	L	18	9	Y	1	1	N	127	64				100	14	7				24	1	1	24	1	1
OF	0	0	LF	0	0													**Actual Injuries**			28	1	1	28	0	0
ON	1	1	LS	0	0													*Value*	*Freq*	*%*	32	0	0	32	0	0
OU	0	0	H	7	4													F	0	0	36	0	0	36	0	0
T	0	0	HF	0	0													S	10	14	40	0	0	40	0	0
TO	1	1	HS	0	0													M	61	86	44	0	0	44	0	0
TF	2	1	S	0	0														71	100	48	0	0	48	1	1
TN	4	2	SF	0	0																52	1	1	52	0	0
TU	0	0	SS	0	0																56	0	0	56	0	0
D	0	0																			60	0	0	60	0	0
DO	23	12																			64	0	0	64	0	0
DF	3	2																			68	1	1	68	0	0
DN	5	3																				5	3		4	2
DU	0	0																								
	200	100		199	99.5		200	100		200	100		200	100		200	100					14	7		11	6

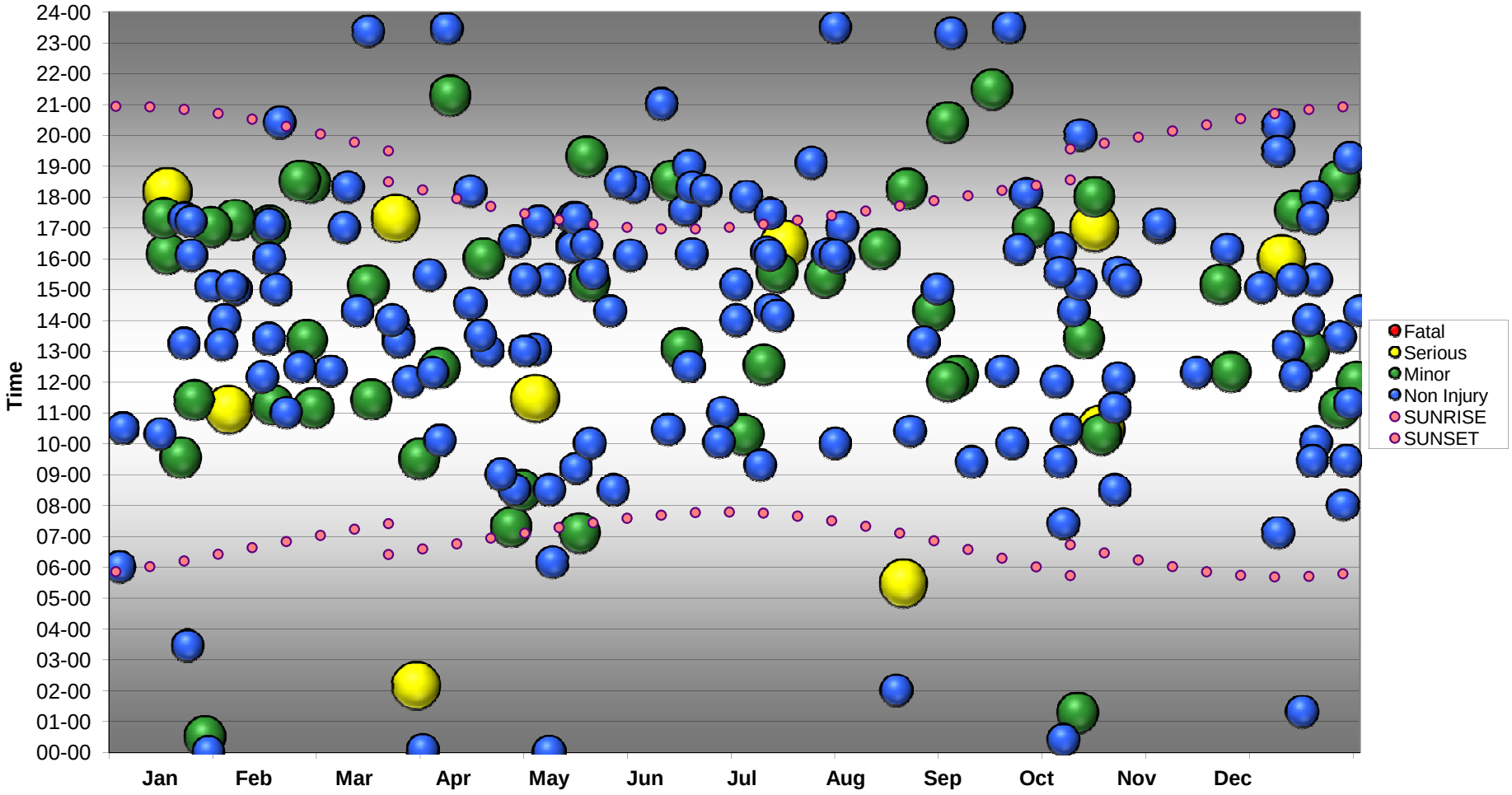
Moutueka Transportation Study Crash Analysis [2004-2008]



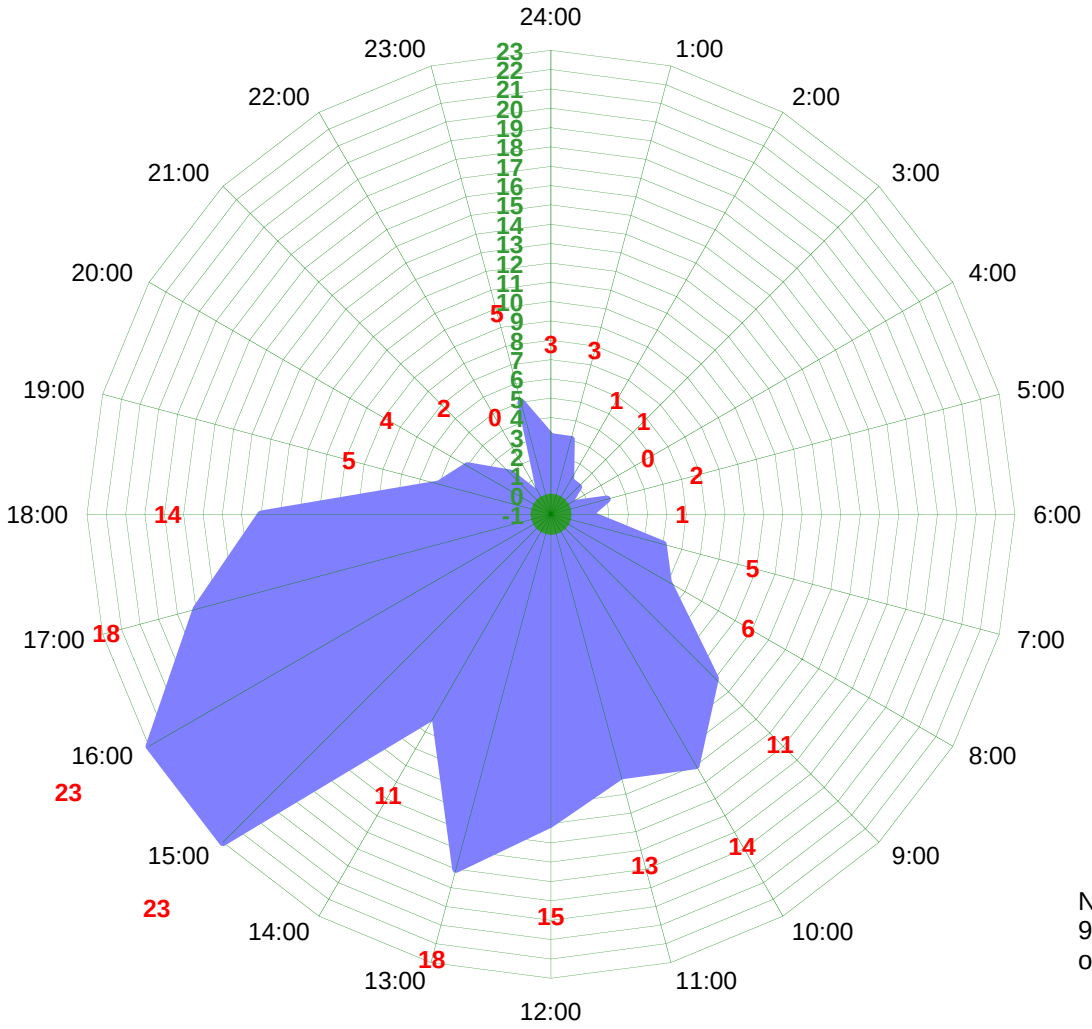


Moutueka Transportation Study Crash Analysis [2004-2008]

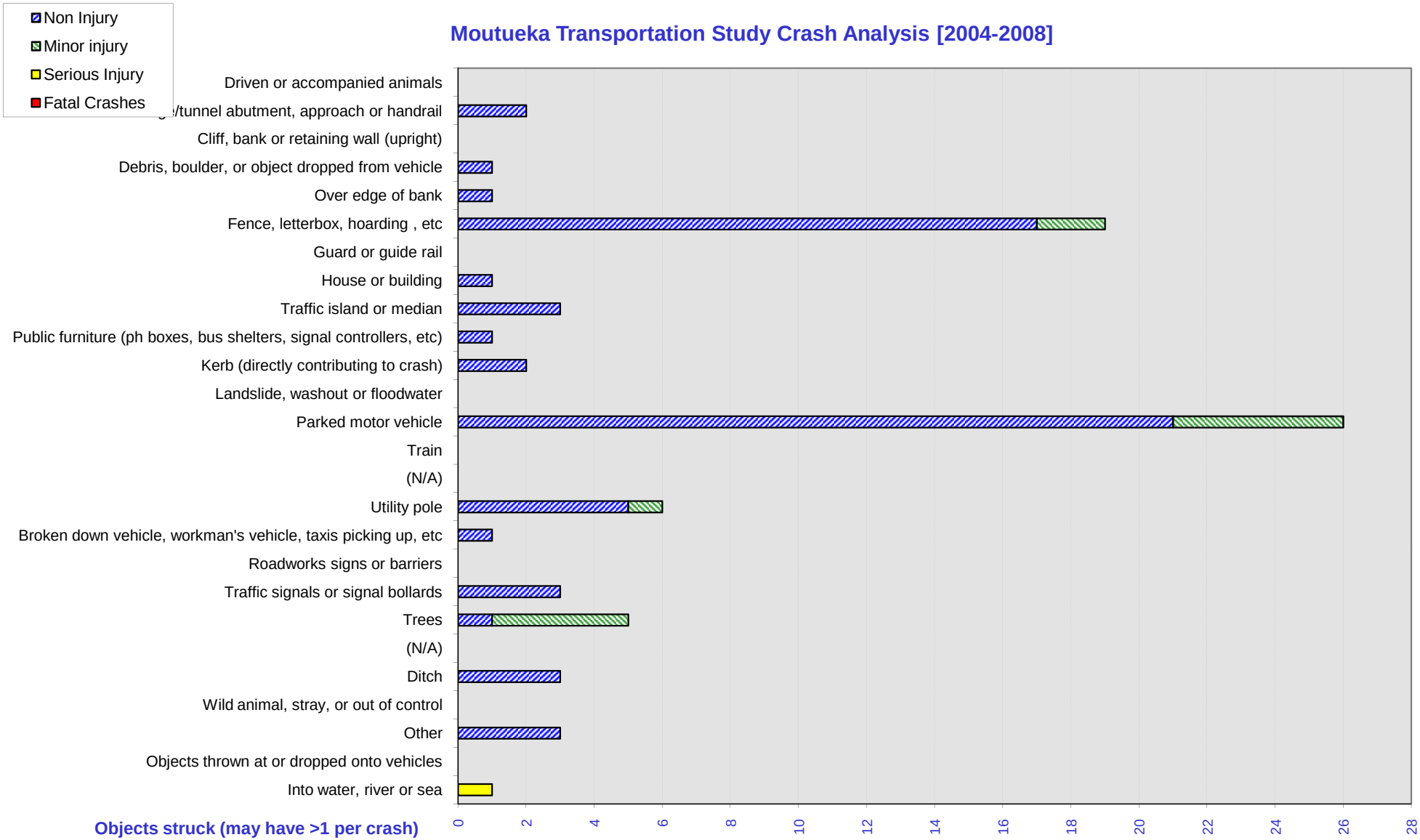
Moutueka Transportation Study Crash Analysis [2004-2008]



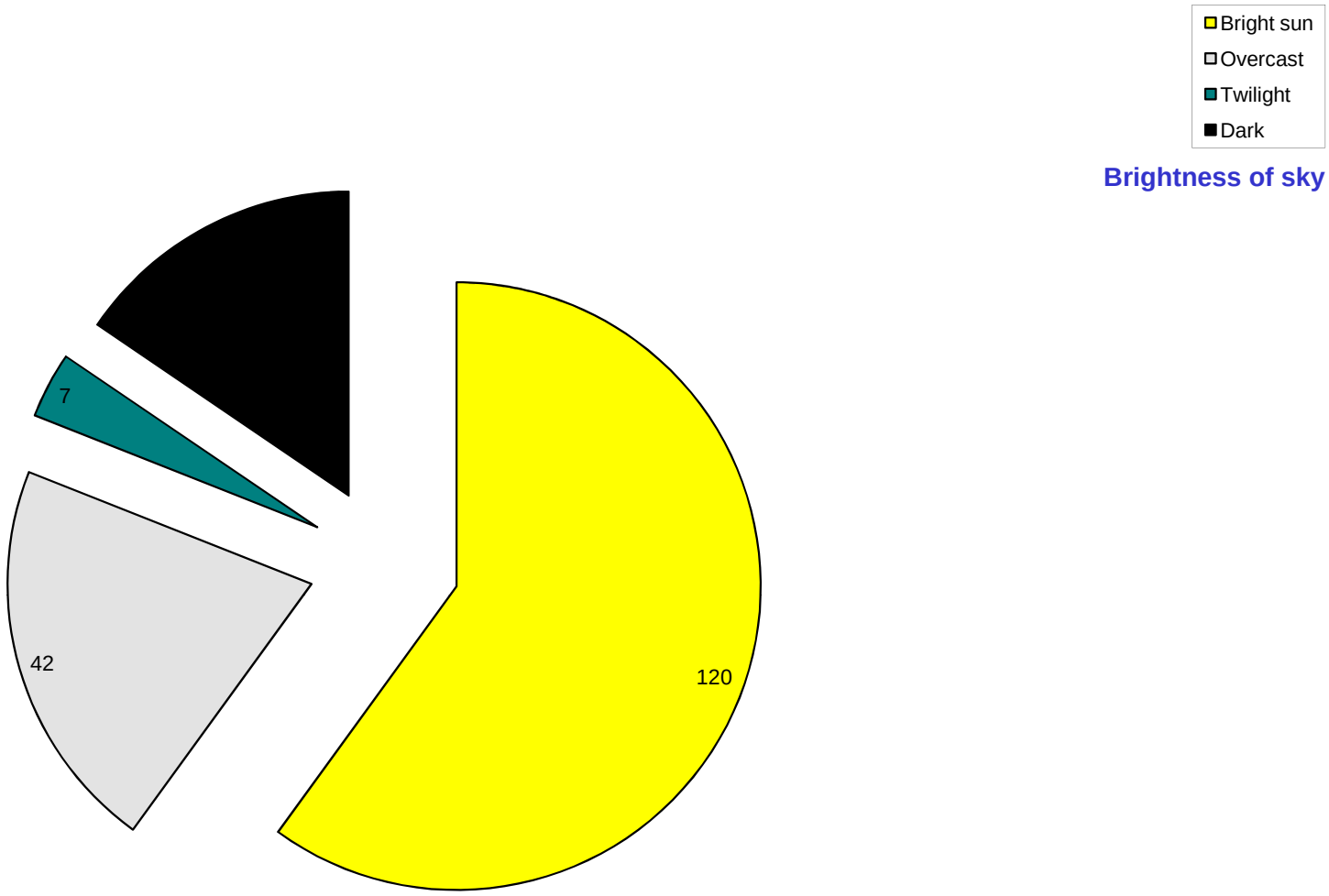
Moutueka Transportation Study Crash Analysis [2004-2008]



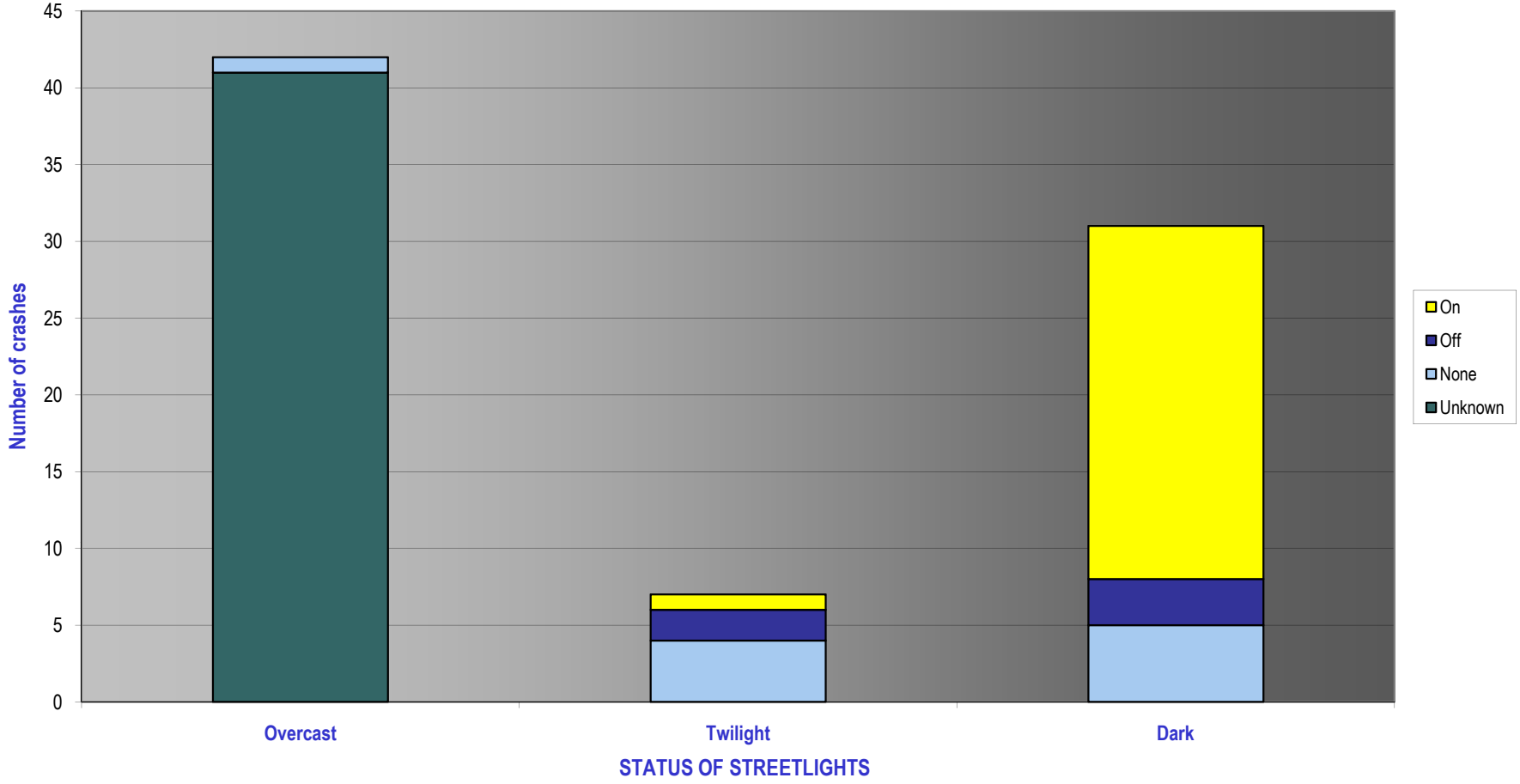
NOTE:
9:00 displays the number of crashes occurring from 8:00:00 to 8:59:59.


Moutueka Transportation Study Crash Analysis [2004-2008]
Non Injury
Minor injury
Serious Injury
Fatal Crashes
Driven or accompanied animals
/tunnel abutment, approach or handrail
Cliff, bank or retaining wall (upright)
Debris, boulder, or object dropped from vehicle
Over edge of bank
Fence, letterbox, hoarding , etc
Guard or guide rail
House or building
Traffic island or median
Public furniture (ph boxes, bus shelters, signal controllers, etc)
Kerb (directly contributing to crash)
Landslide, washout or floodwater
Parked motor vehicle
Train
(N/A)
Utility pole
Broken down vehicle, workman's vehicle, taxis picking up, etc
Roadworks signs or barriers
Traffic signals or signal bollards
Trees
(N/A)
Ditch
Wild animal, stray, or out of control
Other
Objects thrown at or dropped onto vehicles
Into water, river or sea
Objects struck (may have >1 per crash)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28

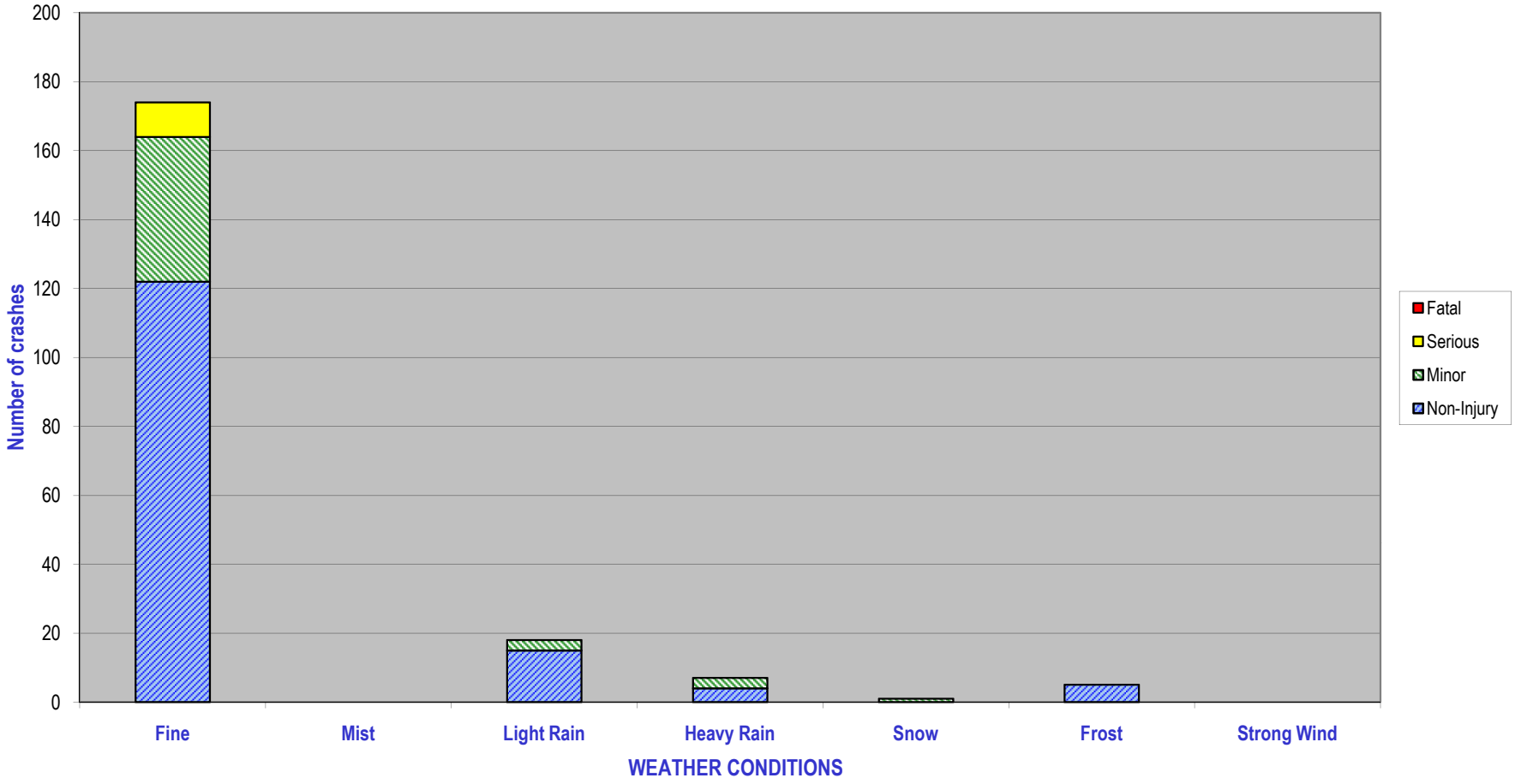
Moutueka Transportation Study Crash Analysis [2004-2008]



Moutueka Transportation Study Crash Analysis [2004-2008]



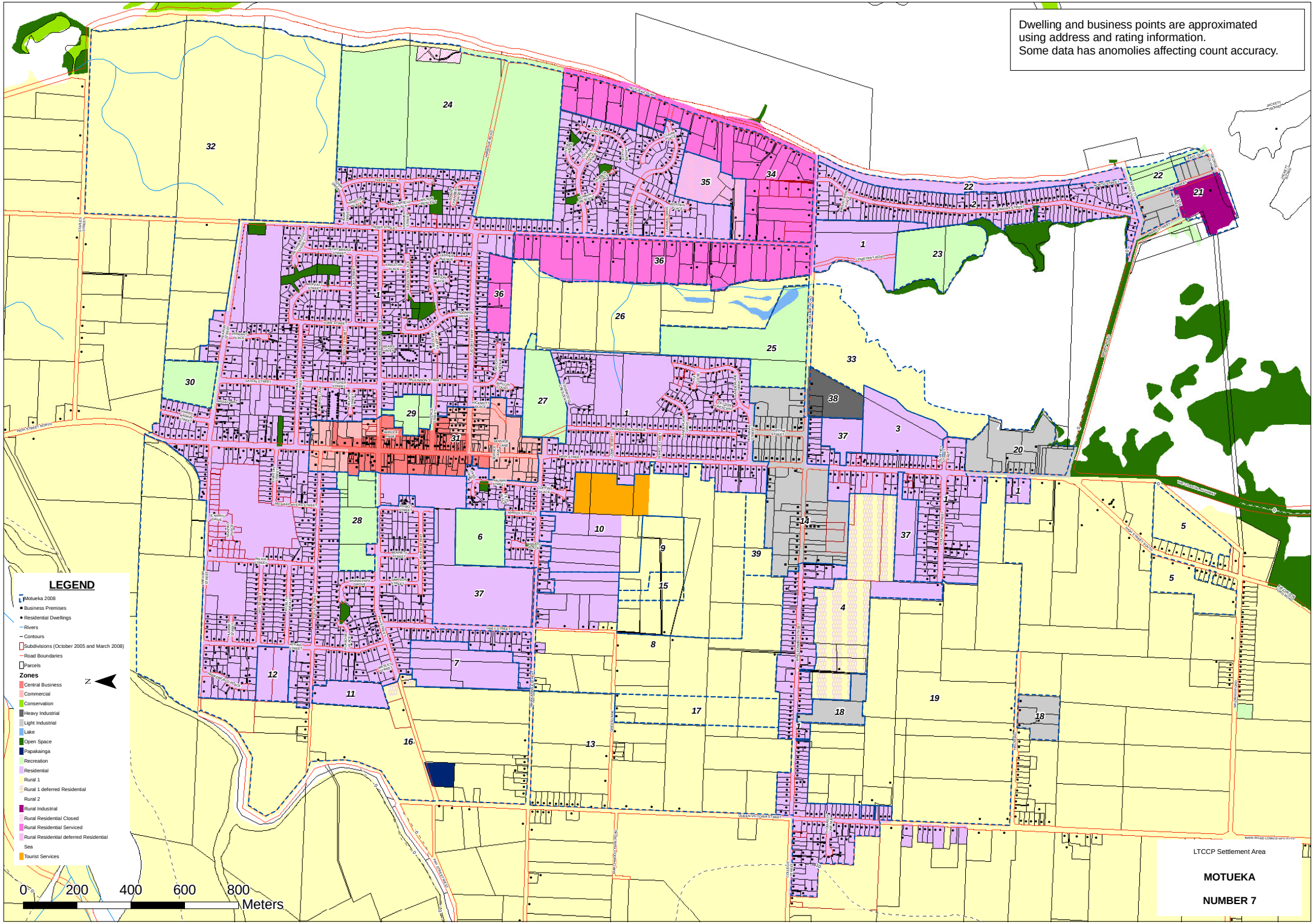
Moutueka Transportation Study Crash Analysis [2004-2008]



Crash Sites

SITE_ID	CRASH ROAD			SIDE ROAD	TOTAL	2004	2005	2006	2007	2008	FATAL	SERIOUS	MINOR	NON INJ	INJURY	FS/INJ	LOC	REAR END	CROSSING	WET %	DARK %	INTERSECTION %	CURVE	PEDESTRIAN	CYCLIST	SPD LIM	SOCIAL COST	COMMENT
2411030	COLLEGE ST	I		CHAMBERLAIN ST	3	2	1	0	0	0	0	2	1	0	3	67%			100%	0%	0%	100%	0	0	1	100	$ 3,182,592.90	3 involved motorcyle
2450992	60/33/1584	I		PAH ST	11	3	2	2	3	1	0	1	3	7	4	25%		27%	36%	0%	9%	82%	0	4	1	50	$ 2,224,368.45	1 involving motorcycle
2553014	WHAKAREWA ST	I		QUEEN VICTORIA ST	7	0	2	2	2	1	0	1	1	5	2	50%		14%	86%	0%	14%	100%	0	0	0	50	$ 1,892,136.45	
2612812	60/33/1721		80 S	POOLE ST	4	1	0	2	1	0	0	1	0	3	1	100%	25%	25%	50%	25%	25%	0%	0	0	1	50	$ 1,677,624.45	1 involving motorcycle
2650555	60/33/1634		50 N	GREENWOOD ST	3	0	0	2	1	0	0	1	0	2	1	100%		67%		0%	67%	0%	0	1	0	50	$ 1,629,228.45	
2411658	GREENWOOD ST	I		VOSPER ST	2	2	0	0	0	0	0	1	0	1	1	100%			50%	0%	0%	100%	0	0	1	50	$ 1,580,832.45	
2453592	60/33/975	I		WHAKAREWA ST	9	2	3	2	0	2	0	0	3	6	3	0%		33%	56%	33%	0%	78%	0	1	0	50	$ 643,536.00	2 involving HCVs
2413430	60/17/16183	I		KING EDWARD ST	8	2	0	2	1	3	0	0	3	5	3	0%		38%	63%	50%	0%	100%	1	0	0	50	$ 595,140.00	1 involving motorcycle, 2 involving HCVs
2711211	WHARF ROAD	I		WARD ST	5	1	2	0	1	1	0	0	2	3	2	0%		40%	20%	0%	40%	20%	0	0	2	100	$ 380,628.00	
2411400	60/17/15195	I		WHARF ROAD	4	1	0	2	0	1	0	0	2	2	2	0%	50%		50%	25%	50%	100%	3	0	0	50	$ 332,232.00	
2451276	60/33/1253	I		TUDOR ST	4	1	2	0	0	1	0	0	2	2	2	0%		50%		0%	0%	50%	0	0	0	50	$ 332,232.00	
2511257	INGLIS ST	I		VOSPER ST	4	0	2	1	0	1	0	0	2	2	2	0%	25%		75%	0%	0%	100%	0	0	1	50	$ 332,232.00	
2552189	60/33/1801	I		POOLE ST	5	0	1	3	0	1	0	0	1	4	1	0%		20%	40%	20%	0%	80%	1	0	0	50	$ 311,304.00	1 involving motorcycle, 1 involving HCVs
2811508	Z CPK DECKS RESERVE		50 E	GREENWOOD/SH 60	3	1	0	0	0	2	0	0	2	1	2	0%		67%		33%	0%	0%	0	1	0	50	$ 283,836.00	
2451315	KING EDWARD ST		90 E	QUEEN VICTORIA ST	3	1	0	0	1	1	0	0	1	2	1	0%		33%	33%	0%	0%	0%	0	1	0	50	$ 214,512.00	1 involving HCVs
2551981	60/33/1418		30 N	WALLACE ST	3	1	1	0	1	0	0	0	1	2	1	0%		100%		0%	0%	0%	0	1	0	50	$ 214,512.00	
2656401	TUDOR ST	I		THORP ST	3	0	0	2	1	0	0	0	1	2	1	0%	33%		67%	0%	0%	100%	0	0	1	50	$ 214,512.00	
2855265	WHAKAREWA ST	I		NAUMAI ST	3	0	0	0	2	1	0	0	1	2	1	0%		67%	33%	0%	0%	67%	0	0	0	50	$ 214,512.00	1 involving HCV

Appendix C – Tasman Growth, Supply-Demand Model


Dwelling and business points are approximated using address and rating information.
Some data has anomolies affecting count accuracy.
LEGEND
Motueka 2008
Business Premises
Residential Dwellings
Rivers
Contours
Subdivisions (October 2005 and March 2008)
Road Boundaries
Parcels
Zones
Central Business
Commercial
Conservation
Heavy Industrial
Light Industrial
Lake
Open Space
Papakainga
Recreation
Residential
Rural 1
Rural 1 deferred Residential
Rural 2
Rural Industrial
Rural Residential Closed
Rural Residential Serviced
Rural Residential deferred Residential
Sea
Tourist Services
N
0 200 400 600 800 Meters
LTCCP Settlement Area
MOTUEKA
NUMBER 7

Motueka

Use of existing lots and new lot development to meet Demand

Supply

Residential

Development Area No.	Average Area of Existing Lots (m2)	Total Potential Lots	Potential New Lots	New Lots		Development Timeframe (Years)						
						1 to 10						
						1 - 3	1 - 3	4 - 10	4 - 10	11 to 20	11 to 20	20+
					Existing vacant lots	Existing lots used	Used to satisfy Demand	Existing lots used	Used to satisfy Demand	Existing lots used	Used to satisfy Demand	Existing & New lots to satisfy Demand
1	967	2881	559	140	66	3	35	6	40	8	60	54
2	878	173	18	0	16							
3	27350	68	66	53	1			1	8		12	33
4	13008	195	183	147	10					2	10	145
5	25433	76	73	0	2							
7	10383	31	25	18	6	2	6	4	12			
8	9435	366	335	234	15	4	15	8	30	3	30	159
10	15553	591	572	400	16	2	15	4	30	6	40	319
11	23600	12	11	8	0		2		6			
12	12150	12	10	7	0		2		5			
16	15830	59	22	0	18							
19	20464	115	87	0	20							
26	15047	23	8	5	13					2		16
32	94463	76	68	0	7							
34	3475	61	8	0	10							
35	7100	14	8	5	1			1	5			
36	4104	62	17	9	12	1	2	2	4	1	3	8
0	0	0	0	0								
0	0	0	0	0								
TOTALS (Residential)		4815		1025		12	77	26	140	22	155	734
					Demand		89		166		177	
					New Lots		77		140		155	653

Business

Development Area No.	Average Area of Existing Lots (m2)	Total Potential Lots	Potential New Lots	New Lots		Development Timeframe (Years)						
						1 to 10						
						1 - 3	1 - 3	4 - 10	4 - 10	11 to 20	11 to 20	20+
						Existing lots used	Used to satisfy Demand	Existing lots used	Used to satisfy Demand	Existing lots used	Used to satisfy Demand	Used to satisfy Demand
6	38800	1	0	0	1							
9	8100	5	0	0	5							
13	9945	164	131	92	15			1	4		9	93
14	2077	147	77	8	24	2	3		4	2	3	15
15	2529	30	23	18	7		1	1	3			20
17	10783	6	0	0	3							
18	8033	6	0	0	1							
20	2514	56	34	16	16	1		2	1	1	2	25
21	3533	15	0	0	12	2		2		2		6
22	4575	9	1	0	8							
23	19900	3	0	0	3							
24	31654	14	1	0	10							
25	51200	2	0	0	2							
27	8960	6	1	0	5							
28	6150	8	0	0	8							
29	2156	10	1	0	9							
30	30400	1	0	0	1							
31	652	254	27	11	89	3	1	2	1			93
33	38433	3	0	0	3							
37	8141	22	0	0	22							
38	6850	34	30	8	1						2	7
39	12800	26	24	12	2						1	13
TOTALS		823		165		8	5	11	13	5	17	272
					Demand		13		24		22	
					New Lots		5		13		17	130

INPUT FACTORS

Residential

Development Area No.	Land End use	Density	New Lot size (m2)	Area (ha)	Existing lots	Existing Dwellings	Existing available lots for dwellings	Area of Roads & minor Reserves (ha)	Terrain %	Infill %	Assessment Record Evaluation
1	Res	M	800	267.86	2322	2256	66	43.4	100	25	pos
2	Res	M	800	15.64	155	144	16	2.03	100	0	neg
3	Res	M	800	5.47	2	1	1	0	100	80	pos
4	Res	M	800	15.61	12	2	10	0	100	80	pos
5	Rural res	M	1000	7.63	3	5	2	0	100	0	neg
7	Res	L	2000	6.23	6	0	6	0	100	70	pos
8	Res	M	800	29.83	31	16	15	0.58	100	70	pos
10	Res	H	500	29.55	19	3	16	0	100	70	pos
11	Res	L	2000	2.36	1	1	0	0	100	70	pos
12	Res	L	2000	2.43	2	2	0	0	100	70	pos
16	Rural res	L	10000	59.49	37	19	18	0.92	95	0	neg
19	Rural res	L	5000	57.3	28	9	20	0	100	0	neg
26	Res	L	10000	22.57	15	2	13	0	100	60	pos
32	Rural res	L	10000	76	8	1	7	0.43	95	0	neg
34	Res	L	3000	18.52	53	43	10	0.1	100	0	neg
35	Res	L	3000	4.26	6	5	1	0	100	60	pos
36	Res	L	3000	18.47	45	33	12	0	95	60	pos
TOTALS				639.2200	2745	2542	213				

Business

Development Area No.	Land End use	New Lot size (m2)	Area (ha)	Existing lots	Existing built on lots	Existing available lots for buildings	Area of Roads & minor Reserves (ha)	Terrain %	Infill %	Assessment Record Evaluation	Existing dwellings
6	Recreation	38800	3.88	1	0	1	0	100	0	pos	0
9	Recreation	8000	4.05	5	1	5	0	100	0	pos	0
13	Light Industrial	**2000**	33.28	33	0	15	0.46	100	**70**	pos	19
14	Light Industrial	1000	16.23	70	45	24	1.69	100	10	pos	6
15	Commercial	600	1.77	7	0	7	0	100	**80**	pos	0
17	Recreation	11000	6.47	6	0	3	0	100	0	pos	3
18	Light Industrial	8000	4.82	6	4	1	0	100	0	neg	1
20	Light Industrial	1000	6.43	22	2	16	0.9	95	50	pos	4
21	Light Industrial	3500	6.1	15	2	12	0.8	80	0	pos	1
22	Recreation	4500	5.57	8	0	8	1.91	100	0	pos	0
23	Recreation	20000	5.97	3	0	3	0	100	0	pos	0
24	Recreation	30000	41.15	13	0	10	0	100	0	pos	3
25	Recreation	50000	10.24	2	0	2	0	90	0	pos	0
27	Recreation	8000	4.48	5	0	5	0	90	0	pos	0
28	Recreation	6000	4.92	8	0	8	0	100	0	pos	0
29	Recreation	2000	1.94	9	0	9	0	100	0	pos	0
30	Recreation	30000	3.04	1	0	1	0	100	0	pos	0
31	Commercial	600	17.89	227	83	89	3.08	100	**40**	pos	55
33	Recreation	38000	11.53	3	0	3	0	90	0	neg	0
37	School	8000	18.33	22	0	22	0.42	100	0	pos	0
38	Heavy Industrial	800	2.74	4	2	1	0	90	30	pos	1
39	Light Industrial	1000	2.56	2	0	2	0	100	**50**	pos	0
TOTALS			213.3900	472	139	247					93

Future Demand

Residential

Population

Current Population	2009	**6408**
Household size	(persons)	**2.40**

Population Projection - SNZ 2006 base area

Years		Projected population	% Annual growth
	at		
1 to 3	2012	**6620**	1.09
4 to 10	2019	**7015**	0.83
11 to 20	2029	**7434**	0.58

Dwellings required

Years	Dwellings
1 to 3	88
4 to 10	164
11 to 20	175

Business
(Residential)

Population

Current Population	2009	**223**
Household size	(persons)	**2.40**

Population Projection

Years		Projected population	% Annual growth
	at		
1 to 3	2012	**225**	0.32
4 to 10	2019	**229**	0.24
11 to 20	2029	**233**	0.17

Dwellings required

Years	Dwellings
1 to 3	1
4 to 10	2
11 to 20	2

Total Population projected at 2029 **7668**

Business
(Buildings)

Existing number of buildings

139

Future number of Building Sites required

Yrs 1 - 3	Yrs 4 - 10	Yrs 11 - 20
13	**24**	**22**

Future Building Sites required

	1 - 3	4 - 10	11 - 20
Industrial	**8**	**14**	**13**
Commercial	**4**	**8**	**7**
Retail	**1**	**2**	**2**

Appendix D – Site Photos

Photo 1 – Note parking sign and parking opposite Wallace Street.

Photo 2 – Note parking sign hidden by trees opposite Tudor Street.

Photo 3 – Note cycle parking on High Street south of Pah Street intersection.

Photo 4 – King Edward Street intersection with High Street. Note pavement and traffic.

Photo 5 – King Edward Street intersection with High Street. Note power poles and traffic.

Photo 6 – King Edward Street intersection with Queen Victoria Street.

Note: all photos taken 01/07/2009

Photo 7 – Drainage channel on Option 2 northern alignment.

Photo 8 – Option 2 northern alignment to High Street North.

Photo 9 – Whakarewa Street Int with High Street.

Photo 10 – High Street viewed north from Tudor Street Int. Note on-street parking.

Photo 11 – Walkway to High Street view from Decks Reserve Carpark

Photo 12 – Wallace Street viewed from High Street. Note one-way here.

Note: all photos taken 01/07/2009

Photo 13 – High Street. Note seating and shop advertising signs.

Photo 14 – High Street viewed towards Pah Street Int. Note pedestrian crossing.

Photo 15 – Queen Victoria Street viewed north from King Edward Street.

Photo 16 – High Street viewed north from Whakarewa Street. Note flush median.

Photo 17 – Wildman Road viewed east towards SH60. Lower Option 2 route.

Note: all photos taken 01/07/2009

Appendix E – Option Drawings

MWH

BUILDING A BETTER WORLD

NZ TRANSPORT AGENCY / TASMAN DISTRICT COUNCIL
MOTUEKA TRANSPORTATION STUDY

DRAWINGS INDEX

DWG No.	DRAWING TITLE
Z1808200__C002__A	PROPOSED INTERSECTION UPGRADES, SITE LOCATIONS
Z1808200__C003__A	PROPOSED INTERSECTION UPGRADES, SITE 1 - QUEEN VICTORIA ST. OPTION - NORTHERN EXTENSIONS
Z1808200__C004__A	PROPOSED INTERSECTION UPGRADES, SITE 2 - HIGH ST. / PARKER ST. / FEARON ST. INTERSECTION
Z1808200__C005__A	PROPOSED INTERSECTION UPGRADES, SITE 3 - HIGH ST.: PAH ST. TO TUDOR ST.
Z1808200__C006__A	PROPOSED INTERSECTION UPGRADES, SITE 4 - HIGH ST.: TUDOR ST. TO WHAKAWERA ST.
Z1808200__C007__A	PROPOSED INTERSECTION UPGRADES, SITE 5 - HIGH ST. / KING EDWARD ST. / OLD WHARF RD. INTERSECTION
Z1808200__C008/1__A	PROPOSED INTERSECTION UPGRADES, SITE 6A - QUEEN VICTORIA ST. / WILDMAN RD. INTERSECTION
Z1808200__C008/2__A	PROPOSED INTERSECTION UPGRADES, SITE 6B - QUEEN VICTORIA ST. SOUTHERN EXTENSION
Z1808200__C009__A	PROPOSED INTERSECTION UPGRADES, SITE 7 - TALBOT ST. OPTION

PRELIMINARY

25/11/2009

Project No.	Sheet No.	Rev.
Z1808200	C001	A

SITE LOCATIONS AND INTERSECTIONS

SITE 1:	QUEEN VICTORIA ST OPTION – NORTHERN EXTENSIONS	–	REFER TO DRAWING Z1808200__C003
SITE 2:	HIGH ST. / PARKER ST. / FEARON ST. INTERSECTION	–	REFER TO DRAWING Z1808200__C004
SITE 3:	HIGH ST.: PAH ST. TO TUDOR ST.	–	REFER TO DRAWING Z1808200__C005
SITE 4:	HIGH ST.: TUDOR ST. TO WHAKAWERA ST.	–	REFER TO DRAWING Z1808200__C006
SITE 5:	HIGH ST. / KING EDWARD ST. / OLD WHARF RD. INTERSECTION	–	REFER TO DRAWING Z1808200__C007
SITE 6A:	QUEEN VICTORIA ST. / WILDMAN RD. INTERSECTION	–	REFER TO DRAWING Z1808200__C008-1
SITE 6B:	QUEEN VICTORIA ST. SOUTHERN EXTENSION	–	REFER TO DRAWING Z1808200__C008-2
SITE7:	TALBOT ST. OPTION	–	REFER TO DRAWING Z1808200__C009

DO NOT SCALE – IF IN DOUBT, ASK

ORIGINAL SIZE A1

NOT FOR CONSTRUCTION

REV	REVISIONS	DRAWN	CHECKED	APPROVED	DATE
A	PRELIMINARY	PTB	25.11.09	PJP	25.11.09

	Name	Date
SURVEYED	–	–
DESIGNED	P BROPHY	08/09
DESIGN CHECK	O BROWN	08/09
DRAWN	P BROPHY	08/09
DRAWING CHECK	J WALTERS	08/09
APPROVED	P PEET	25/11/09

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SITE LOCATIONS

Status Stamp: PRELIMINARY

Date Stamp: 25/11/2009

SCALES (A1) NOT TO SCALE

Drawing No.	Sheet No.	Rev.
Z1808200	C002	A

XREFS :

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DO NOT SCALE – IF IN DOUBT, ASK

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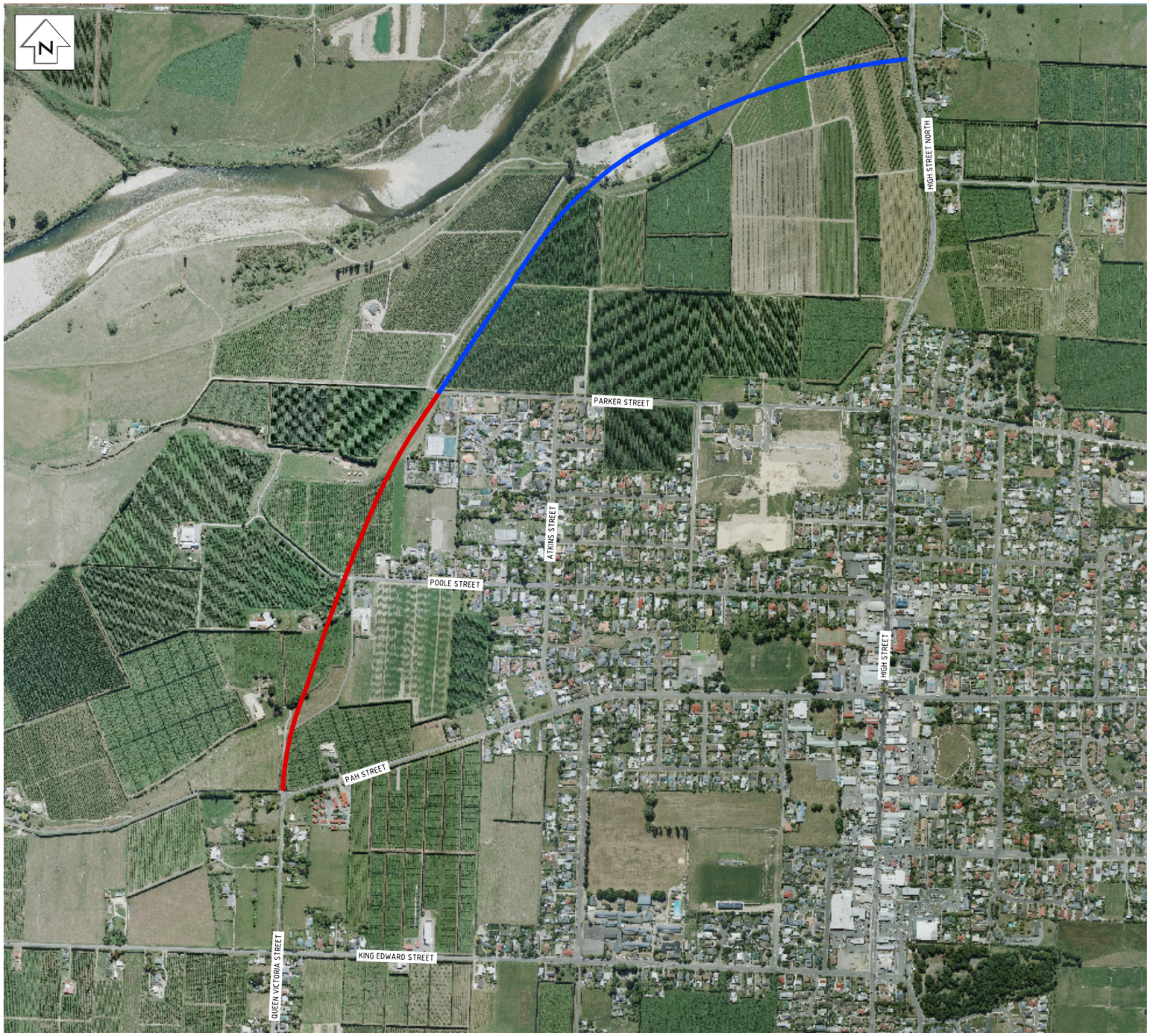
ORIGINAL SIZE **A1**



PARKER ST. EXTENSION

STOPBANK EXTENSION

NOT FOR CONSTRUCTION

REV	REVISIONS	DRAWN	CHECKED	APPROVED	DATE
A	PRELIMINARY	PTB	25.11.09	PJP	25.11.09

	Name	Date
SURVEYED	-	-
DESIGNED	P BROPHY	08/09
DESIGN CHECK	O BROWN	08/09
DRAWN	P BROPHY	08/09
DRAWING CHECK	J WALTERS	08/09
APPROVED	P PEET	25/11/09

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SITE 1
QUEEN VICTORIA ST. OPTION – NORTHERN EXTENSIONS

Status Stamp: **PRELIMINARY**

Date Stamp: **25/11/2009**

SCALES **(A1)** 1:5,000 (1:10,000 @ A3)

Drawing No.	Sheet No.	Rev.
Z1808200	C003	A

XREFS :

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DO NOT SCALE – IF IN DOUBT, ASK

200 mm 150 100 90 80 70 60 50 40 30 20 10 0

ORIGINAL SIZE **A1**

NOT FOR CONSTRUCTION

REV	REVISIONS	DRAWN	CHECKED	APPROVED	DATE
A	PRELIMINARY	PTB	25.11.09	PJP	25.11.09

	Name	Date
SURVEYED	-	-
DESIGNED	P BROPHY	08/09
DESIGN CHECK	O BROWN	08/09
DRAWN	P BROPHY	08/09
DRAWING CHECK	J WALTERS	08/09
APPROVED	P PEET	25/11/09

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MOTUEKA TRANSPORTATION STUDY

SITE 2
HIGH ST. / PARKER ST. / FEARON ST. INTERSECTION

Status Stamp: **PRELIMINARY**

Date Stamp: **25/11/2009**

SCALES **(A1)** 1:250 (1:500 @ A3)

Drawing No.	Sheet No.	Rev.
Z1808200	C004	A

XREFS :

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DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1

NOT FOR CONSTRUCTION

REV	REVISIONS	DRAWN	CHECKED	APPROVED	DATE
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	Name	Date
SURVEYED	-	-
DESIGNED	D WOOD	08/09
DESIGN CHECK	O BROWN	08/09
DRAWN	D WOOD	08/09
DRAWING CHECK	J WALTERS	08/09
APPROVED	P PEET	25/11/09

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SITE 3
HIGH ST.: PAH ST. TO TUDOR ST.

Status Stamp: **PRELIMINARY**

Date Stamp: **25/11/2009**

SCALES **(A1)** 1:500 (1:1000 @ A3)

Drawing No.	Sheet No.	Rev.
Z1808200	C005	A

XREFS :

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DO NOT SCALE - IF IN DOUBT, ASK

ORIGINAL SIZE A1

NOT FOR CONSTRUCTION

REV	REVISIONS	DRAWN	CHECKED	APPROVED	DATE
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	Name	Date
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DESIGN CHECK	O BROWN	08/09
DRAWN	P BROPHY	08/09
DRAWING CHECK	J WALTERS	08/09
APPROVED	P PEET	25/11/09

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MOTUEKA TRANSPORTATION STUDY

SITE 4
HIGH ST.: TUDOR ST. TO WHAKAWERA ST.

Status Stamp: **PRELIMINARY**

Date Stamp: **25/11/2009**

SCALES **(A1)** 1:500 (1:1000 @ A3)

Drawing No.	Sheet No.	Rev.
Z1808200	C006	A

XREFS :

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NOT FOR CONSTRUCTION

DO NOT SCALE – IF IN DOUBT, ASK

ORIGINAL SIZE A1

REV	REVISIONS	DRAWN	CHECKED	APPROVED	DATE
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	Name	Date
SURVEYED	-	-
DESIGNED	P BROPHY	08/09
DESIGN CHECK	O BROWN	08/09
DRAWN	P BROPHY	08/09
DRAWING CHECK	J WALTERS	08/09
APPROVED	P PEET	25/11/09

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MOTUEKA TRANSPORTATION STUDY

SITE 5
HIGH ST. / KING EDWARD ST. / OLD WHARF RD. INTERSECTION

Status Stamp: PRELIMINARY

Date Stamp: 25/11/2009

SCALES (A1) 1:250 (1:500 @ A3)

Drawing No.	Sheet No.	Rev.
Z1808200	C007	A

XREFS :

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DO NOT SCALE - IF IN DOUBT, ASK

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ORIGINAL SIZE **A1**

NOT FOR CONSTRUCTION

REV	REVISIONS	DRAWN	CHECKED	APPROVED	DATE
A	PRELIMINARY	PTB	25.11.09	PJP	25.11.09

	Name	Date
SURVEYED	-	-
DESIGNED	P BROPHY	08/09
DESIGN CHECK	O BROWN	08/09
DRAWN	P BROPHY	08/09
DRAWING CHECK	J WALTERS	08/09
APPROVED	P PEET	25/11/09

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MOTUEKA TRANSPORTATION STUDY

SITE 6A
QUEEN VICTORIA ST. / WILDMAN RD. INTERSECTION

Status Stamp: **PRELIMINARY**

Date Stamp: **25/11/2009**

SCALES **(A1)** 1:1,000 (1:2,000 @ A3)

Drawing No.	Sheet No.	Rev.
Z1808200	C008/1	A

XREFS :

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DO NOT SCALE - IF IN DOUBT, ASK

200 mm 150 100 90 80 70 60 50 40 30 20 10 0

ORIGINAL SIZE **A1**

NOT FOR CONSTRUCTION

REV	REVISIONS	DRAWN	CHECKED	APPROVED	DATE
A	PRELIMINARY	PTB	25.11.09	PJP	25.11.09

	Name	Date
SURVEYED	-	-
DESIGNED	P BROPHY	08/09
DESIGN CHECK	O BROWN	08/09
DRAWN	P BROPHY	08/09
DRAWING CHECK	J WALTERS	08/09
APPROVED	P PEET	25/11/09

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SITE 6B
QUEEN VICTORIA ST. SOUTHERN EXTENSION

Status Stamp: **PRELIMINARY**

Date Stamp: **25/11/2009**

SCALES **(A1)** 1:1,000 (1:2,000 @ A3)

Drawing No.	Sheet No.	Rev.
Z1808200	C008/2	A

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DO NOT SCALE - IF IN DOUBT, ASK

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ORIGINAL SIZE **A1**

NOT FOR CONSTRUCTION

REV	REVISIONS	DRAWN	CHECKED	APPROVED	DATE
A	PRELIMINARY	PTB	25.11.09	PJP	25.11.09

	Name	Date
SURVEYED	-	-
DESIGNED	D WOOD	08/09
DESIGN CHECK	O BROWN	08/09
DRAWN	D WOOD	08/09
DRAWING CHECK	J WALTERS	08/09
APPROVED	P PEET	25/11/09

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SITE 7
TALBOT ST. OPTION

Status Stamp: **PRELIMINARY**

Date Stamp: **25/11/2009**

SCALES **(A1)** 1:1000 (1:2000 @ A3)

Drawing No.	Sheet No.	Rev.
Z1808200	C009	A

XREFS :

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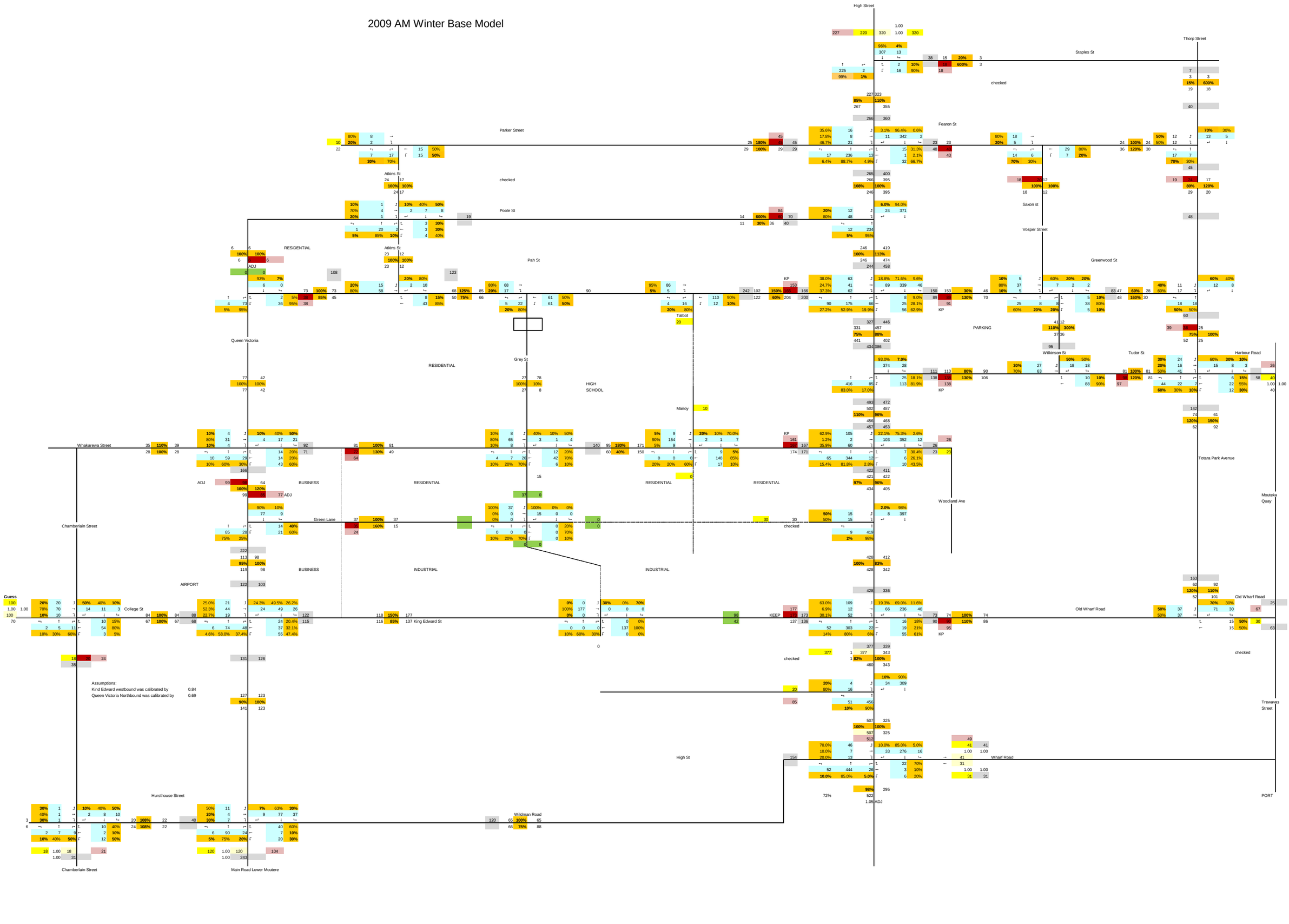
Appendix F – Traffic Modelling Results

2009 AM Winter Base Model



2009 AM Summer Base Model

Assumptions:
Kind Edward westbound was calibrated by 0.84
Queen Victoria Northbound was calibrated by 0.69

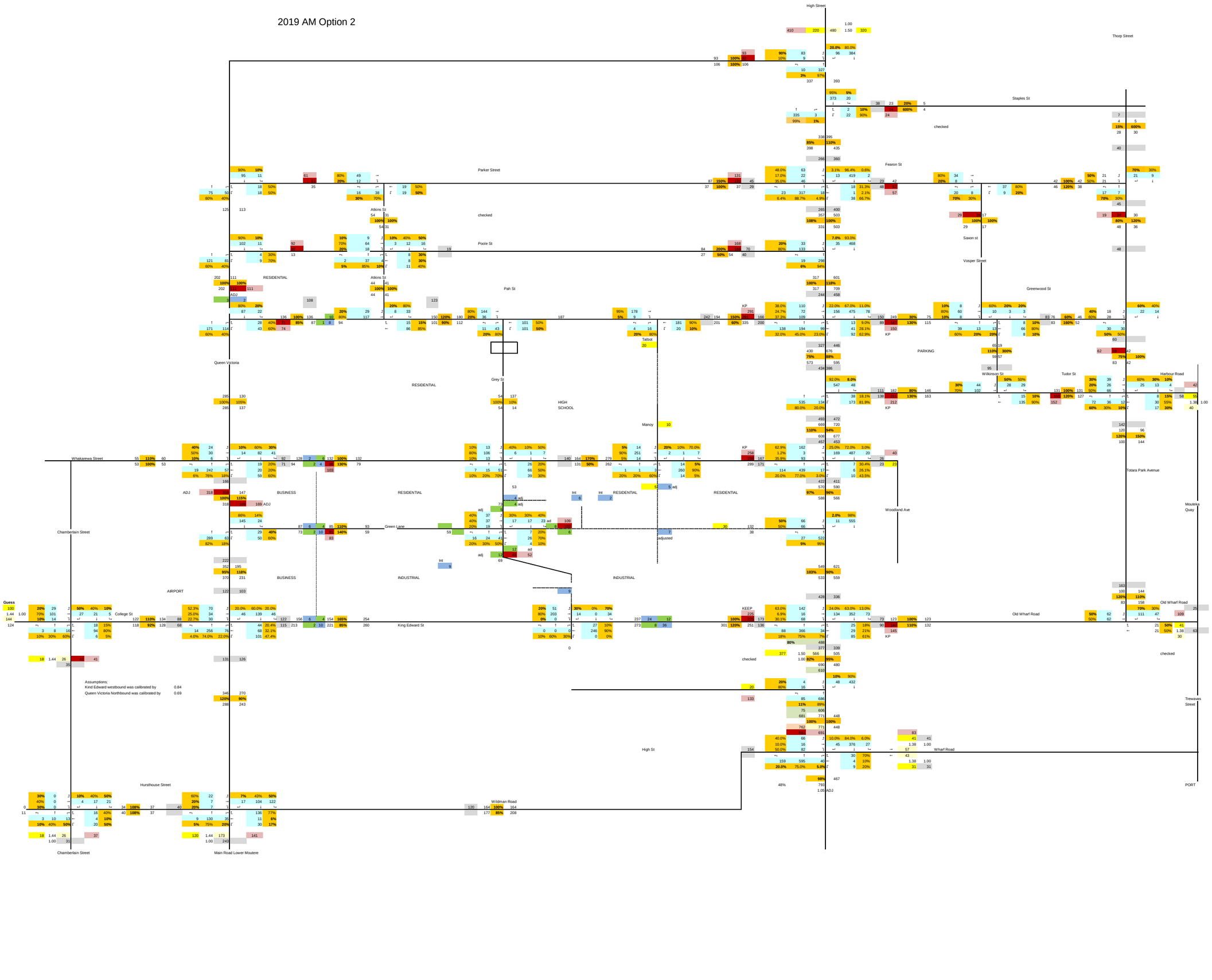
2019 AM Winter Base Model

High Street
Thorp Street
Staples St
checked
Fearon St
Parker Street
Atkins St
checked
Poole St
Saxon st
Vosper Street
RESIDENTIAL
Atkins St
Pah St
Greenwood St
ADJ
KP
Talbot
PARKING
Queen Victoria
Grey St
RESIDENTIAL
HIGH SCHOOL
Wilkinson St
Tudor St
Harbour Road
Manoy
KP
Whakarewa Street
Totara Park Avenue
ADJ
BUSINESS
RESIDENTIAL
Int
Int
RESIDENTIAL
RESIDENTIAL
Woodland Ave
Moutoka Quay
Chamberlain Street
Green Lane
adjusted
BUSINESS
INDUSTRIAL
INDUSTRIAL
AIRPORT
Guess
College St
King Edward St
KEEP
Old Wharf Road
Old Wharf Road
KP
checked
checked
Assumptions:
Kind Edward westbound was calibrated by 0.84
Queen Victoria Northbound was calibrated by 0.69
Trewavas Street
High St
Wharf Road
Hursthouse Street
Wildman Road
PORT
Chamberlain Street
Main Road Lower Moutere

2019 AM Summer Base Model

High Street
Thorp Street
Staples St
checked
Fearon St
Parker Street
Atkins St
checked
Poole St
Saxon st
Vosper Street
RESIDENTIAL
Atkins St
Pah St
Greenwood St
ADJ
KP
PARKING
Talbot
Queen Victoria
RESIDENTIAL
Grey St
HIGH
SCHOOL
Wilkinson St
Tudor St
Harbour Road
Manoy
Whakarewa Street
Totara Park Avenue
ADJ
BUSINESS
RESIDENTIAL
Int
Int
RESIDENTIAL
RESIDENTIAL
adj
adj
Woodland Ave
Mouteka Quay
Chamberlain Street
Green Lane
adjusted
Int
BUSINESS
INDUSTRIAL
INDUSTRIAL
AIRPORT
Guess
College St
King Edward St
KEEP
checked
Old Wharf Road
Old Wharf Road
Assumptions:
Kind Edward westbound was calibrated by 0.84
Queen Victoria Northbound was calibrated by 0.69
Trewavas Street
High St
Wharf Road
Hurstlouse Street
Wildman Road
PORT
Chamberlain Street
Main Road Lower Moutere

2019 AM Option 2



2019 AM Option 4

High Street
Thorp Street
Staples St
checked
Fearon St
Parker Street
Atkins St
checked
Poole St
fine
fine
Saxon st
Vosper Street
RESIDENTIAL
Atkins St
Pah St
fine
Greenwood St
ADJ
fine
fine
fine
KP
Talbot
PARKING
Queen Victoria
RESIDENTIAL
Grey St
HIGH
SCHOOL
Manoy
Wilkinson St
Tudor St
Harbour Road
KP
Whakarewa Street
ADJ
BUSINESS
RESIDENTIAL
Int
Int
RESIDENTIAL
RESIDENTIAL
Woodland Ave
Totara Park Avenue
Mouteka Quay
Chamberlain Street
Green Lane
adjusted
Guess
College St
BUSINESS
INDUSTRIAL
INDUSTRIAL
AIRPORT
King Edward St
KEEP
Old Wharf Road
checked
Trewavas Street
High St
Wharf Road
Hursthouse Street
Wildman Road
Chamberlain Street
Main Road Lower Moutere
PORT

Assumptions:
Kind Edward westbound was calibrated by 0.84
Queen Victoria Northbound was calibrated by 0.69

2029 AM Winter Base Model

High Street
Thorp Street
Staples St
checked
Fearon St
Parker Street
Atkins St
checked
Poole St
Saxon st
Vosper Street
RESIDENTIAL
Atkins St
Pah St
Greenwood St
ADJ
KP
Talbot
PARKING
Queen Victoria
Grey St
RESIDENTIAL
HIGH SCHOOL
Wilkinson St
Tudor St
Harbour Road
Manoy
KP
Whakarewa Street
adj
Totara Park Avenue
ADJ
BUSINESS
RESIDENTIAL
Int
Int
RESIDENTIAL
RESIDENTIAL
Woodland Ave
Moutoka Quay
Chamberlain Street
adj
Green Lane
ad
ad
Int
BUSINESS
INDUSTRIAL
INDUSTRIAL
AIRPORT
Guess
College St
Old Wharf Road
Old Wharf Road
219 King Edward St
adj
adj
KEEP
KP
checked
checked
Assumptions:
Kind Edward westbound was calibrated by 0.84
Queen Victoria Northbound was calibrated by 0.69
Trewawes Street
High St
Wharf Road
Hursthouse Street
Wildman Road
PORT
Chamberlain Street
Main Road Lower Moutere

2029 AM Summer Base Model

High Street
Thorp Street
Staples St
checked
Fearon St
Parker Street
Atkins St
checked
Poole St
Saxon st
Vosper Street
RESIDENTIAL
Atkins St
Pah St
Greenwood St
ADJ
KP
Talbot
PARKING
Queen Victoria
Grey St
RESIDENTIAL
HIGH SCHOOL
Wilkinson St
Tudor St
Harbour Road
Manoy
Whakarewa Street
Totara Park Avenue
ADJ
BUSINESS
RESIDENTIAL
Int
Int
RESIDENTIAL
RESIDENTIAL
Woodland Ave
Moutoka Quay
Chamberlain Street
adj
Green Lane
adj
ad
ad
Int
AIRPORT
BUSINESS
INDUSTRIAL
INDUSTRIAL
Guess
College St
adj
King Edward St
adj
KEEP
Old Wharf Road
Old Wharf Road
KP
checked
checked
Trewavas Street
High St
Wharf Road
Hursthouse Street
Wildman Road
PORT
Chamberlain Street
Main Road Lower Moutere

Assumptions:
Kind Edward westbound was calibrated by 0.84
Queen Victoria Northbound was calibrated by 0.69

2029 AM Option 2

High Street

Thorp Street

Staples St

checked

Fearon St

Parker Street

Atkins St

checked

Poole St

Saxon st

Vosper Street

RESIDENTIAL

Atkins St

Pah St

Greenwood St

ADJ

KP

Talbot

PARKING

Queen Victoria

RESIDENTIAL

Grey St

HIGH SCHOOL

Wilkinson St

Tudor St

Harbour Road

Manoy

Totara Park Avenue

Whakarewa Street

ADJ

BUSINESS

RESIDENTIAL

Green Lane

Int

Int

RESIDENTIAL

RESIDENTIAL

Woodlands Ave

Moutere Quay

Chamberlain Street

ad

ad

Int

INDUSTRIAL

INDUSTRIAL

AIRPORT

BUSINESS

Guess

College St

344 King Edward St

KEEP

KP

Old Wharf Road

checked

Assumptions:

Kind Edward westbound was calibrated by 0.84

Queen Victoria Northbound was calibrated by 0.69

Trewavas Street

High St

Wharf Road

Hursthouse Street

Wildman Road

Main Road Lower Moutere

PORT

2029 AM Option 4

High Street
Thorp Street
Staples St
checked
Fearon St
Parker Street
Atkins St
checked
Poole St
Saxon st
Vosper Street
RESIDENTIAL
Atkins St
Pah St
Greenwood St
ADJ
Queen Victoria
Talbot
PARKING
RESIDENTIAL
Grey St
HIGH SCHOOL
Manoy
Wilkinson St
Tudor St
Harbour Road
Whakarewa Street
ADJ
BUSINESS
RESIDENTIAL
Green Lane
Woodland Ave
Totara Park Avenue
Mouteka Quay
Chamberlain Street
BUSINESS
INDUSTRIAL
INDUSTRIAL
AIRPORT
College St
King Edward St
Old Wharf Road
Old Wharf Road
High St
Wharf Road
Trewavas Street
Hursthouse Street
Wildman Road
Chamberlain Street
Main Road Lower Moutere
PORT

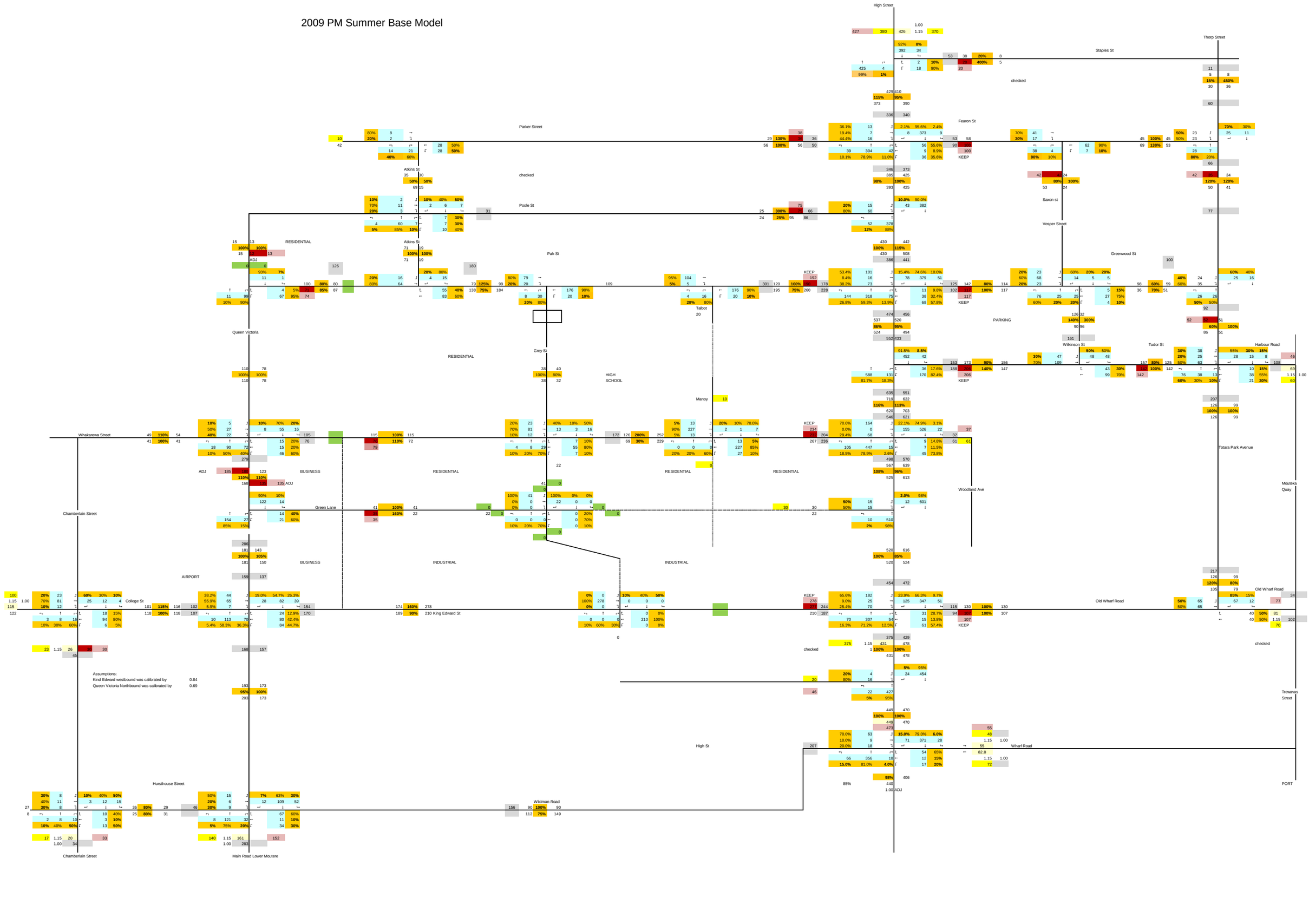
Assumptions:
Kind Edward westbound was calibrated by 0.84
Queen Victoria Northbound was calibrated by 0.69

2009 PM Winter Base Model

High Street
Thorp Street
Staples St
Fearon St
Parker Street
checked
Atkins St
Poole St
Saxon st
Vosper Street
RESIDENTIAL
Pah St
Greenwood St
Talbot
Queen Victoria
PARKING
Wilkinson St
Tudor St
Harbour Road
Grey St
RESIDENTIAL
HIGH SCHOOL
Manoy
Whakarewa Street
Totara Park Avenue
ADJ
BUSINESS
RESIDENTIAL
RESIDENTIAL
RESIDENTIAL
Woodland Ave
Mouteka Quay
Chamberlain Street
Green Lane
AIRPORT
BUSINESS
INDUSTRIAL
INDUSTRIAL
Old Wharf Road
College St
187 King Edward St
Trewavas Street
High St
Wharf Road
Hursthouse Street
Wildman Road
PORT
Chamberlain Street
Main Road Lower Moutere

Assumptions:
Kind Edward westbound was calibrated by 0.84
Queen Victoria Northbound was calibrated by 0.69

2009 PM Summer Base Model



2019 PM Winter Base Model

High Street
Thorp Street
Staples St
checked
Fearon St
Parker Street
Atkins St
checked
Poole St
Saxon st
Vosper Street
RESIDENTIAL
Atkins St
Pah St
Greenwood St
ADJ
KEEP
Talbot
PARKING
Queen Victoria
RESIDENTIAL
Grey St
HIGH SCHOOL
Wilkinson St
Tudor St
Harbour Road
Manoy
KEEP
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Whakarewa Street
BUSINESS
RESIDENTIAL
RESIDENTIAL
RESIDENTIAL
Totara Park Avenue
Woodland Ave
Moutere Quay
Chamberlain Street
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ad
ADJ
ADJ
BUSINESS
INDUSTRIAL
INDUSTRIAL
Int
Int
AIRPORT
College St
223 King Edward St
Old Wharf Road
Old Wharf Road
KEEP
Guess
checked
checked
Assumptions:
Kind Edward westbound was calibrated by 0.84
Queen Victoria Northbound was calibrated by 0.69
Trewavas Street
High St
Wharf Road
Hursthouse Street
Wildman Road
PORT
Chamberlain Street
Main Road Lower Moutere

2019 PM Summer Base Model

High Street
Thorp Street
Staples St
checked
Fearon St
Parker Street
Atkins St
checked
Poole St
Saxon st
Vosper Street
RESIDENTIAL
Atkins St
Pah St
Greenwood St
ADJ
Talbot
PARKING
Queen Victoria
RESIDENTIAL
Grey St
HIGH SCHOOL
Wilkinson St
Tudor St
Harbour Road
Manoy
KEEP
Whakarewa Street
ad
Totara Park Avenue
ADJ
BUSINESS
RESIDENTIAL
RESIDENTIAL
RESIDENTIAL
Woodland Ave
Moutoka Quay
Chamberlain Street
ad
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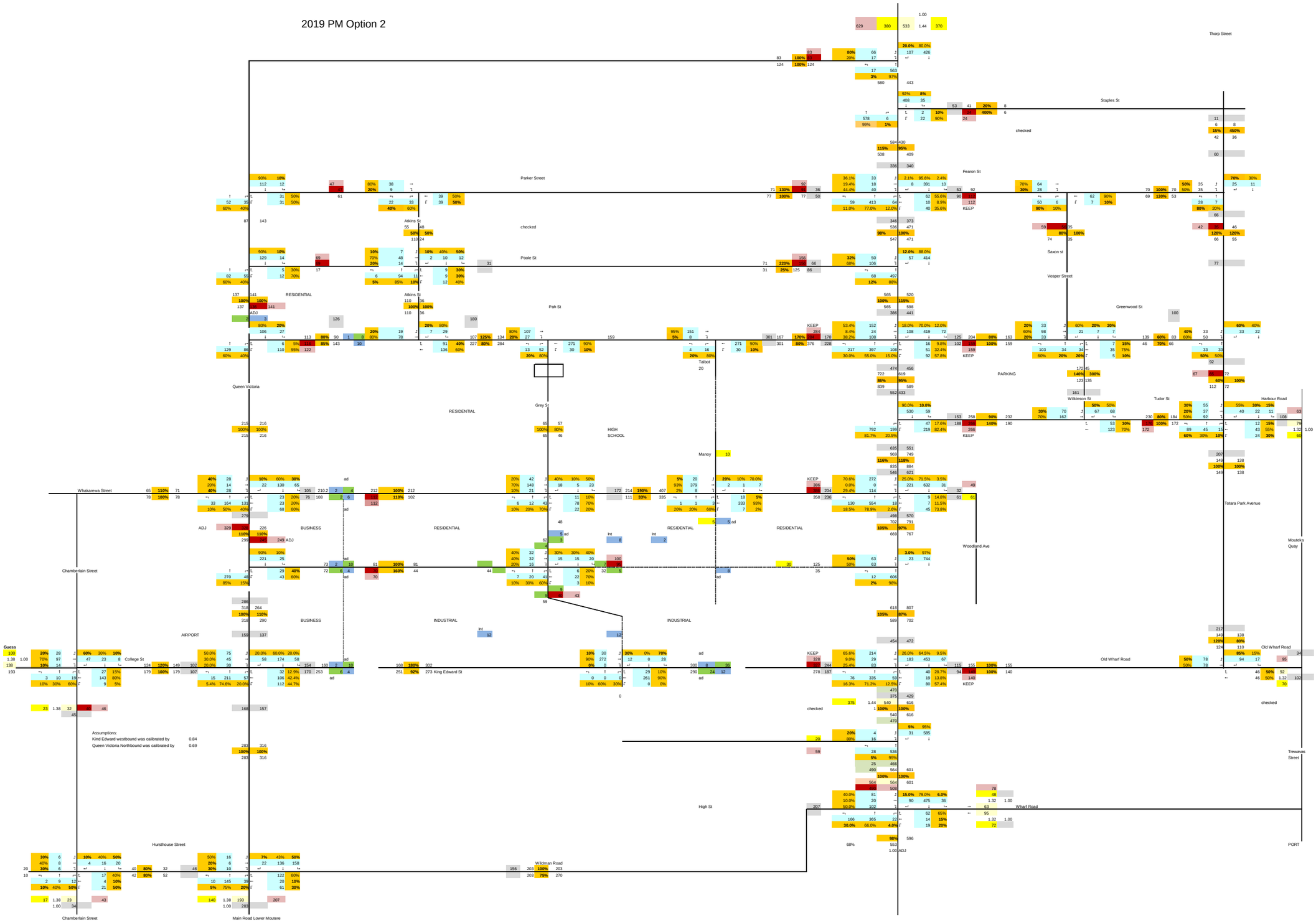
ad
AIRPORT
BUSINESS
INDUSTRIAL
INDUSTRIAL
Int
Int
Int
Guess
College St
ad
ad
ad
289 King Edward St
Old Wharf Road
Old Wharf Road
KEEP
checked
checked
Assumptions:
Kind Edward westbound was calibrated by 0.84
Queen Victoria Northbound was calibrated by 0.69
Trewavas Street
High St
Wharf Road
Hursthouse Street
Wildman Road
PORT
Chamberlain Street
Main Road Lower Moutere

2019 PM Option 2



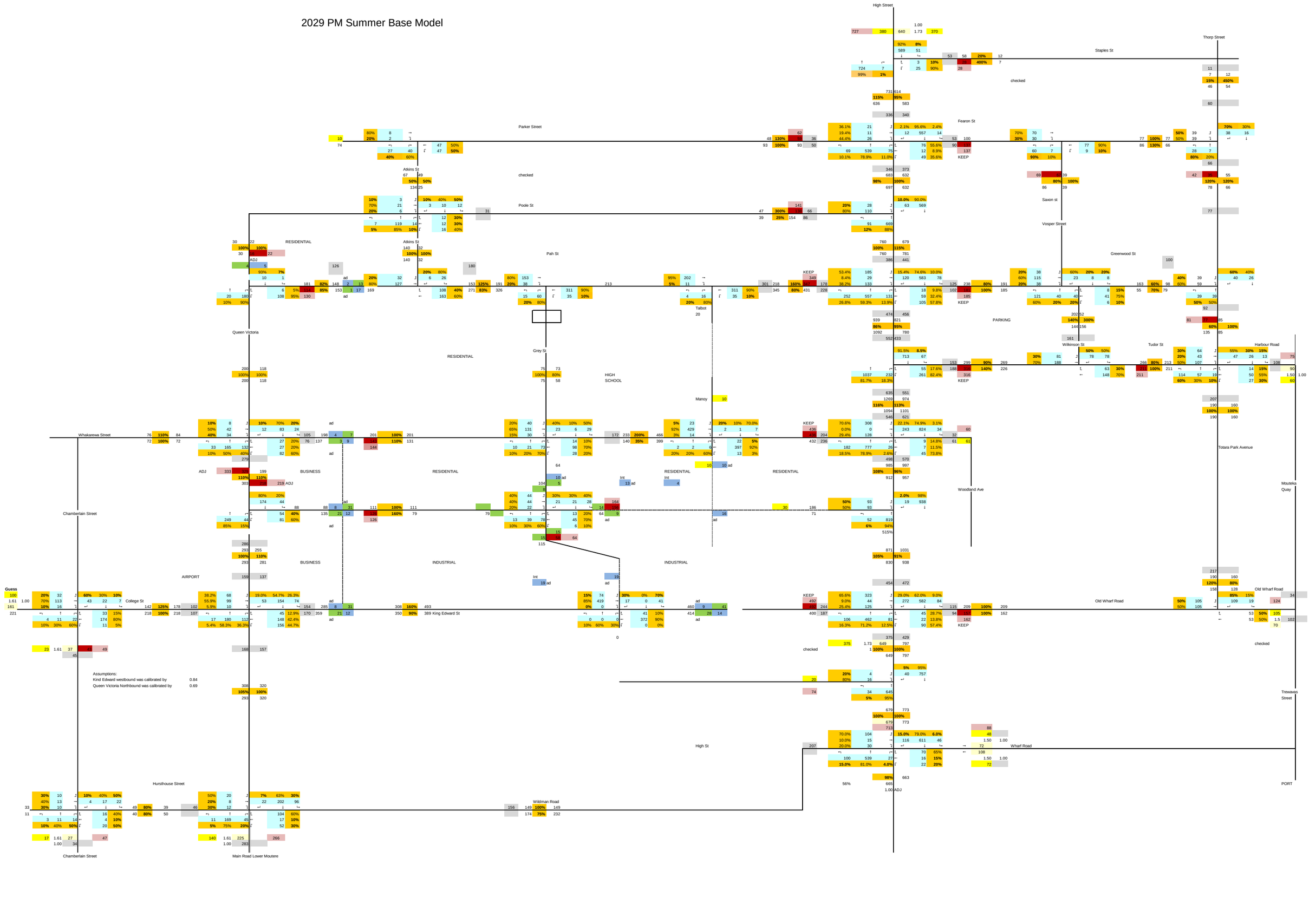
2019 PM Option 4

High Street
Thorp Street
Staples St
checked
Fearon St
Parker Street
Atkins St
checked
Poole St
Saxon st
Vosper Street
RESIDENTIAL
Atkins St
Pah St
Greenwood St
ADJ
Queen Victoria
Talbot
PARKING
Grey St
RESIDENTIAL
HIGH
SCHOOL
Manoy
Wilkinson St
Tudor St
Harbour Road
Whakarewa Street
ad
Totara Park Avenue
BUSINESS
RESIDENTIAL
RESIDENTIAL
Woodland Ave
Mouteka
Quay
Chamberlain Street
BUSINESS
INDUSTRIAL
INDUSTRIAL
AIRPORT
College St
King Edward St
Old Wharf Road
Old Wharf Road
checked
Assumptions:
Kind Edward westbound was calibrated by 0.84
Queen Victoria Northbound was calibrated by 0.69
Hursthouse Street
Wildman Road
High St
Wharf Road
Trewawas
Street
Chamberlain Street
Main Road Lower Moutere
PORT

2029 PM Winter Base Model

High Street
Thorp Street
Staples St
checked
Fearon St
Parker Street
Atkins St
checked
Poole St
Saxon st
Vosper Street
RESIDENTIAL
Atkins St
Pah St
Greenwood St
ADJ
KEEP
Talbot
PARKING
Queen Victoria
RESIDENTIAL
Grey St
HIGH SCHOOL
Wilkinson St
Tudor St
Harbour Road
Manoy
KEEP
Whakarewa Street
Totara Park Avenue
ADJ
BUSINESS
RESIDENTIAL
RESIDENTIAL
RESIDENTIAL
Woodland Ave
Moutoka Quay
Chamberlain Street
BUSINESS
INDUSTRIAL
INDUSTRIAL
AIRPORT
Old Wharf Road
Guess
College St
240 King Edward St
Old Wharf Road
KEEP
checked
checked
Assumptions:
Kind Edward westbound was calibrated by 0.84
Queen Victoria Northbound was calibrated by 0.69
Trewavas Street
High St
Wharf Road
Hursthouse Street
Wildman Road
PORT
Chamberlain Street
Main Road Lower Moutere

2029 PM Summer Base Model



2029 PM Option 2

High Street
Thorp Street
Staples St
checked
Fearon St
Parker Street
Atkins St
checked
Poole St
Saxon st
Vosper Street
RESIDENTIAL
Atkins St
Pah St
Greenwood St
ADJ
ad
KEEP
PARKING
Talbot
Queen Victoria
RESIDENTIAL
Grey St
HIGH
SCHOOL
Wilkinson St
Tudor St
Harbour Road
Manoy
KEEP
Whakarewa Street
BUSINESS
RESIDENTIAL
RESIDENTIAL
RESIDENTIAL
Totara Park Avenue
Woodbourne Ave
Moutoa Quay
Chamberlain Street
ADJ
AIRPORT
BUSINESS
INDUSTRIAL
INDUSTRIAL
Guess
College St
King Edward St
Old Wharf Road
Old Wharf Road
Trewavas Street
High St
Wharf Road
Hursthouse Street
Wildman Road
PORT
Chamberlain Street
Main Road Lower Moutere

Assumptions:
Kind Edward westbound was calibrated by 0.84
Queen Victoria Northbound was calibrated by 0.69

2029 PM Option 4

High Street
Thorp Street
Staples St
checked
Fearon St
Parker Street
Atkins St
checked
Poole St
Saxon st
Vosper Street
RESIDENTIAL
Atkins St
Pah St
Greenwood St
ADJ
Talbot
PARKING
Queen Victoria
Grey St
RESIDENTIAL
HIGH SCHOOL
Manoy
Wilkinson St
Tudor St
Harbour Road
Whakarewa Street
Totara Park Avenue
Woodland Ave
Mouteka Quay
Chamberlain Street
BUSINESS
RESIDENTIAL
RESIDENTIAL
RESIDENTIAL
AIRPORT
BUSINESS
INDUSTRIAL
INDUSTRIAL
College St
King Edward St
Old Wharf Road
Old Wharf Road
checked
Trewavas Street
High St
Wharf Road
Hursthouse Street
Wildman Road
Main Road Lower Moutere
PORT

Assumptions:
Kind Edward westbound was calibrated by 0.84
Queen Victoria Northbound was calibrated by 0.69

Motueka Sidra Summary

SH60 / Parker St / Fearon St AM

Delay (sec/veh)	2009 Worst Movement	2009 Intersection	2019 Worst Movement	2019 Intersection	2029 Worst Movement	2029 Intersection
Existing	13.9	2.3	20.7	2.8	39.6	4.5
Existing with Improvement	14.0	2.1	22.5	2.6	39.6	3.7
Option 2 Existing			16.2	3.4	25.1	4.0
Option 2 Improvement			18.0	3.1	26.4	3.4
Option 4			24.0	2.7	42.8	3.9

SH60 / Parker St / Fearon St PM

Delay (sec/veh)	2009 Worst Movement	2009 Intersection	2019 Worst Movement	2019 Intersection	2029 Worst Movement	2029 Intersection
Existing	15.5	3.0	25.1	4.4	58.9	8.2
Existing with Improvement	17.3	2.9	26.2	3.9	46.3	5.6
Option 2 Existing			19.5	4.0	31.7	6.6
Option 2 Improvement			20.7	3.7	31.2	5.4
Option 4			27.8	3.5	52.2	6.1

SH60 / Pah St / Greenwood St AM

Delay (sec/veh)	2009 Worst Movement	2009 Intersection	2019 Worst Movement	2019 Intersection	2029 Worst Movement	2029 Intersection
Existing	26.5	6.5	467.0	51.7	2546.4	288.4
Existing with Improvement	36.7	21.9	45.2	27.6	72.2	34.0
Option 2 Existing			336.7	44.0	1068.9	123.5
Option 2 Improvement			45.0	28.1	42.9	29.5
Option 4						

SH60 / Pah St / Greenwood St PM

Delay (sec/veh)	2009 Worst Movement	2009 Intersection	2019 Worst Movement	2019 Intersection	2029 Worst Movement	2029 Intersection
Existing	23.9	5.6	467.5	39.9	1773.0	149.5
Existing with Improvement	37.0	22.2	45.9	29.7	101.6	38.9
Option 2 Existing			109.8	13.9	1142.8	103.7
Option 2 Improvement			41.8	27.1	55.4	30.7
Option 4						

SH60 / Tudor St AM

Delay (sec/veh)	2009 Worst Movement	2009 Intersection	2019 Worst Movement	2019 Intersection	2029 Worst Movement	2029 Intersection
Existing	24.2	4.4	105.7	10.5	446.5	33.0
Existing with Improvement	21.3	2.4	57.5	3.6	275.3	8.6
Option 2 Existing			55.0	7.8	298.0	19.8
Option 2 Improvement						
Option 4			30.9	3.2	69.0	4.4

SH60 / Tudor St PM

Delay (sec/veh)	2009 Worst Movement	2009 Intersection	2019 Worst Movement	2019 Intersection	2029 Worst Movement	2029 Intersection
Existing	34.1	5.6	307.6	19.7	715.7	43.1
Existing with Improvement	27.5	2.9	142.2	5.9	378.1	12.0
Option 2 Existing			167.1	12.9	412.8	33.2
Option 2 Improvement						
Option 4			50.2	3.9	231.3	9.3

SH60 / Whakarewa St / Woodland Ave AM

Delay (sec/veh)	2009 Worst Movement	2009 Intersection	2019 Worst Movement	2019 Intersection	2029 Worst Movement	2029 Intersection
Existing	34.6	7.0	339.0	28.9	1449.7	115.3
Existing with Improvement	12.6	5.9	14.8	6.6	20.8	9.4
Option 2 Existing			85.6	11.6	1258.5	104.7
Option 2 Improvement						
Option 4			14.9	6.9	21.6	9.9

SH60 / Whakarewa St / Woodland Ave PM

Delay (sec/veh)	2009 Worst Movement	2009 Intersection	2019 Worst Movement	2019 Intersection	2029 Worst Movement	2029 Intersection
Existing	37.9	7.4	825.7	51.8	1423.1	97.9
Existing with Improvement	13.3	6.0	17.9	8.1	49.9	20.3
Option 2 Existing			561.1	38.4	1198.2	78.3
Option 2 Improvement						
Option 4			17.8	8.3	92.7	28.8

SH60 / King Edward St / Old Wharf Rd AM

Delay (sec/veh)	2009 Worst Movement	2009 Intersection	2019 Worst Movement	2019 Intersection	2029 Worst Movement	2029 Intersection
Existing	27.8	6.2	107.2	12.8	1332.8	107.3
Existing with Improvement	11.9	6.3	13.2	7.2	18.5	10.1
Option 2 Existing			45.3	8.1	560.7	52.3
Option 2 Improvement						
Option 4						

SH60 / King Edward St / Old Wharf Rd PM

Delay (sec/veh)	2009 Worst Movement	2009 Intersection	2019 Worst Movement	2019 Intersection	2029 Worst Movement	2029 Intersection
Existing	24.1	6.4	261.0	26.8	1777.5	150.8
Existing with Improvement	11.7	6.6	14.5	8.1	19.8	13.4
Option 2 Existing			53.2	9.5	1003.9	89.1
Option 2 Improvement						
Option 4						

King Edward St / College St AM

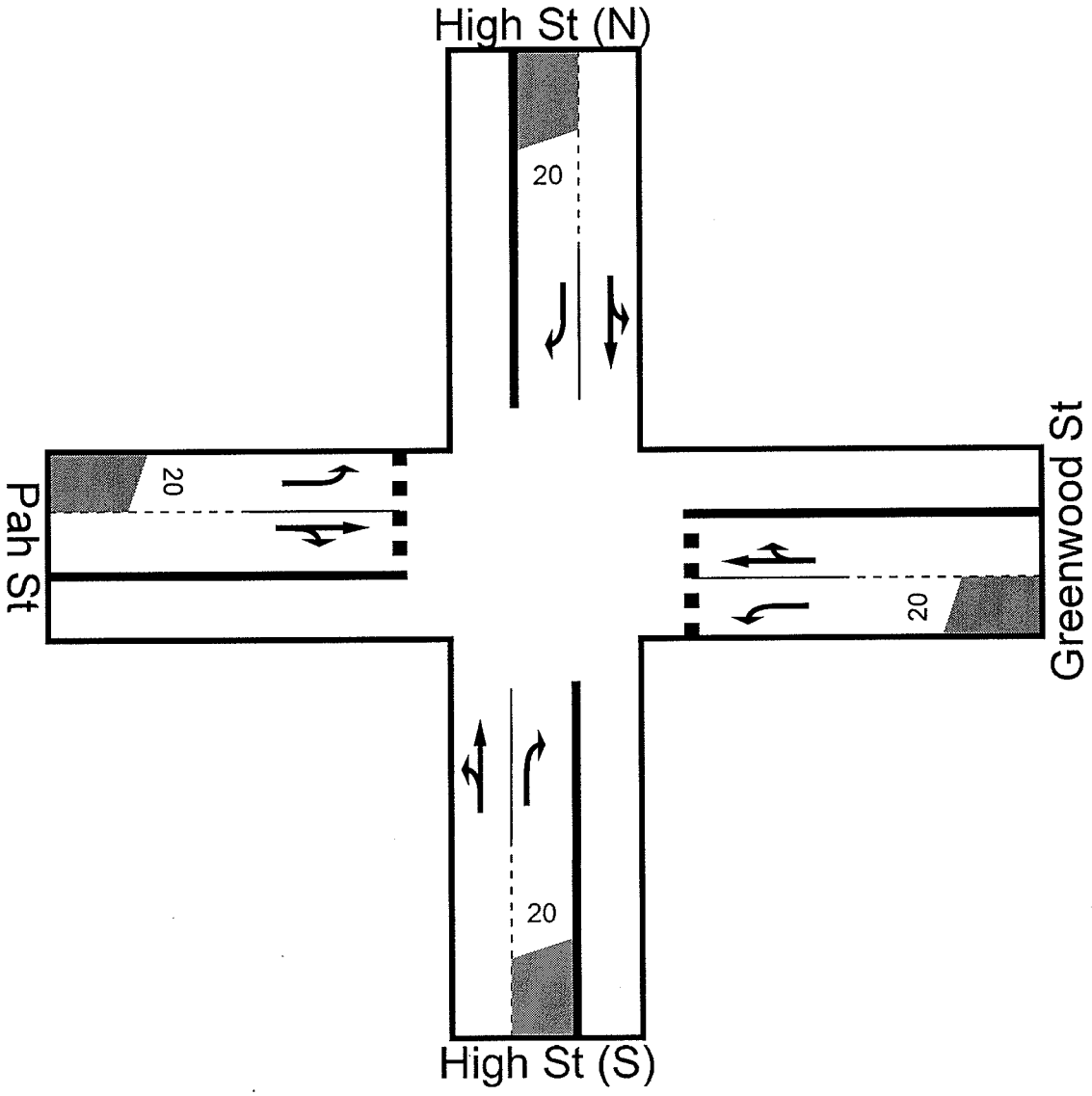
Delay (sec/veh)	2009 Worst Movement	2009 Intersection	2019 Worst Movement	2019 Intersection	2029 Worst Movement	2029 Intersection
Existing	12.1	7.0	13.9	8.0	17.2	9.7
Existing with Improvement						
Option 2 Existing			16.4	7.5	23.7	10.6
Option 2 Improvement						
Option 4						

King Edward St / College St PM

Delay (sec/veh)	2009 Worst Movement	2009 Intersection	2019 Worst Movement	2019 Intersection	2029 Worst Movement	2029 Intersection
Existing	11.6	7.1	13.8	8.0	17.6	9.7
Existing with Improvement						
Option 2 Existing			14.1	7.3	27.5	11.2
Option 2 Improvement						
Option 4						

Key

- Level of Service A
- Level of Service B
- Level of Service C
- Level of Service D
- Level of Service E
- Level of Service F
- Level of Service not applicable (priority intersection)


High St (N)
20
Pah St
20
Greenwood St
20
20
High St (S)

SIDRA INTERSECTION

Movement Summary

Pah_Gre Intersection DM

2009 AM Peak 08:30-09:30

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	103	6.8	0.188	7.1	LOS A	10	0.25	0.58	42.4
2	T	201	7.0	0.188	0.5	LOS A	10	0.25	0.00	47.8
3	R	76	6.7	0.123	9.9	LOS A	4	0.47	0.75	40.5
Approach		**379**	**6.9**	**0.188**	**4.1**	**LOS A**	**10**	**0.29**	**0.31**	**44.6**
Greenwood St										
4	L	65	3.1	0.085	8.8	LOS A	3	0.49	0.71	41.3
5	T	29	3.4	0.174	20.0	LOS C	5	0.78	0.90	33.7
6	R	9	10.0	0.172	21.4	LOS C	5	0.78	0.92	33.0
Approach		**104**	**3.8**	**0.174**	**13.1**	**LOS B**	**5**	**0.60**	**0.78**	**38.0**
High St (N)										
7	L	51	7.8	0.245	7.0	LOS A	16	0.23	0.57	42.5
8	T	381	8.1	0.246	0.4	LOS A	16	0.23	0.00	47.9
9	R	100	8.0	0.161	8.2	LOS A	4	0.34	0.65	42.0
Approach		**533**	**8.1**	**0.245**	**2.5**	**LOS A**	**16**	**0.25**	**0.18**	**46.1**
Pah St										
10	L	73	5.4	0.083	7.4	LOS A	2	0.31	0.62	42.2
11	T	48	4.3	0.495	25.1	LOS D	20	0.84	1.05	31.2
12	R	72	5.6	0.497	26.5	LOS D	20	0.84	1.06	30.5
Approach		**193**	**5.2**	**0.497**	**18.9**	**LOS C**	**20**	**0.64**	**0.89**	**34.4**
All Vehicles		**1209**	**6.9**	**0.497**	**6.5**	**Not Applicable**	**20**	**0.36**	**0.38**	**42.6**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Pah_Gre Intersection DM

2019 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	151	7.3	0.281	7.4	LOS A	18	0.34	0.60	42.1
2	T	294	7.1	0.281	0.8	LOS A	18	0.34	0.00	47.0
3	R	111	7.2	0.239	12.7	LOS B	8	0.61	0.87	38.4
Approach		**556**	**7.2**	**0.281**	**5.0**	**LOS A**	**18**	**0.39**	**0.34**	**43.7**
Greenwood St										
4	L	97	3.1	0.142	10.5	LOS B	5	0.58	0.82	40.0
5	T	43	2.3	0.524	52.0	LOS F	17	0.94	1.07	22.2
6	R	14	7.1	0.519	53.4	LOS F	17	0.94	1.07	21.9
Approach		**154**	**3.2**	**0.527**	**26.0**	**LOS D**	**17**	**0.72**	**0.91**	**30.8**
High St (N)										
7	L	72	8.3	0.346	7.3	LOS A	25	0.33	0.59	42.1
8	T	535	8.0	0.347	0.7	LOS A	25	0.33	0.00	47.1
9	R	140	7.9	0.236	9.2	LOS A	7	0.44	0.72	41.1
Approach		**747**	**8.0**	**0.346**	**2.9**	**LOS A**	**25**	**0.35**	**0.19**	**45.3**
Pah St										
10	L	105	4.8	0.122	7.9	LOS A	3	0.39	0.67	41.9
11	T	68	4.4	1.447	465.7	LOS F	297	1.00	3.48	4.1
12	R	103	4.9	1.451	467.0	LOS F	297	1.00	3.50	4.1
Approach		**276**	**4.7**	**1.444**	**292.0**	**LOS F**	**297**	**0.77**	**2.42**	**6.2**
All Vehicles		**1733**	**6.8**	**1.451**	**51.7**	**Not Applicable**	**297**	**0.46**	**0.66**	**22.0**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Pah_Gre Intersection DM

2029 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	265	1.9	0.513	7.5	LOS A	43	0.44	0.60	41.7
2	T	586	2.0	0.513	1.1	LOS A	43	0.44	0.00	46.2
3	R	138	2.2	0.322	14.3	LOS B	12	0.67	0.93	37.2
Approach		**990**	**2.0**	**0.513**	**4.6**	**LOS A**	**43**	**0.47**	**0.29**	**43.5**
Greenwood St										
4	L	111	0.9	0.166	10.7	LOS B	6	0.60	0.84	39.8
5	T	62	1.6	1.348	493.9	LOS F	147	1.00	2.30	3.9
6	R	19	5.0	1.333	495.3	LOS F	147	1.00	2.35	3.9
Approach		**192**	**1.6**	**1.354**	**217.2**	**LOS F**	**147**	**0.77**	**1.47**	**8.0**
High St (N)										
7	L	82	4.9	0.390	7.4	LOS A	30	0.38	0.60	41.9
8	T	614	5.0	0.390	0.9	LOS A	30	0.38	0.00	46.6
9	R	126	4.8	0.279	13.4	LOS B	10	0.64	0.90	37.9
Approach		**822**	**5.0**	**0.390**	**3.5**	**LOS A**	**30**	**0.42**	**0.20**	**44.6**
Pah St										
10	L	195	1.0	0.270	10.3	LOS B	9	0.58	0.86	40.0
11	T	31	3.2	2.818	1771.7	LOS F	559	1.00	3.57	1.1
12	R	140	0.7	2.857	1773.0	LOS F	559	1.00	3.58	1.1
Approach		**366**	**1.1**	**2.850**	**833.8**	**LOS F**	**559**	**0.77**	**2.13**	**2.4**
All Vehicles		**2370**	**2.9**	**2.857**	**149.5**	**Not Applicable**	**559**	**0.53**	**0.64**	**10.8**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Pah_Gre Intersection DM

2009 PM Peak 16:30-17:30

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	132	2.3	0.251	6.8	LOS A	14	0.22	0.57	42.5
2	T	293	2.0	0.251	0.4	LOS A	14	0.22	0.00	48.1
3	R	69	1.5	0.111	9.0	LOS A	3	0.43	0.71	41.1
Approach		**494**	**2.0**	**0.251**	**3.3**	**LOS A**	**14**	**0.25**	**0.25**	**45.4**
Greenwood St										
4	L	61	1.6	0.078	8.4	LOS A	2	0.46	0.68	41.6
5	T	34	2.9	0.207	20.8	LOS C	6	0.79	0.91	33.3
6	R	10	9.1	0.208	22.1	LOS C	6	0.79	0.94	32.6
Approach		**108**	**2.8**	**0.207**	**13.8**	**LOS B**	**6**	**0.60**	**0.78**	**37.5**
High St (N)										
7	L	46	4.3	0.216	6.9	LOS A	13	0.21	0.57	42.6
8	T	343	5.0	0.216	0.3	LOS A	13	0.21	0.00	48.1
9	R	71	5.6	0.116	8.7	LOS A	3	0.40	0.69	41.4
Approach		**460**	**5.0**	**0.216**	**2.3**	**LOS A**	**13**	**0.24**	**0.16**	**46.4**
Pah St										
10	L	99	1.0	0.112	7.7	LOS A	3	0.38	0.66	42.0
11	T	16	6.2	0.364	22.6	LOS C	13	0.82	0.98	32.4
12	R	71	1.4	0.368	23.9	LOS C	13	0.82	1.00	31.7
Approach		**186**	**1.6**	**0.368**	**15.2**	**LOS C**	**13**	**0.58**	**0.82**	**36.5**
All Vehicles		**1248**	**3.1**	**0.368**	**5.6**	**Not Applicable**	**14**	**0.32**	**0.35**	**43.4**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Pah_Gre Intersection DM

2019 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	213	1.9	0.407	7.2	LOS A	29	0.33	0.59	42.1
2	T	471	1.9	0.407	0.7	LOS A	29	0.33	0.00	47.1
3	R	111	1.8	0.213	11.4	LOS B	7	0.56	0.83	39.2
Approach		**792**	**1.9**	**0.407**	**3.9**	**LOS A**	**29**	**0.36**	**0.27**	**44.4**
Greenwood St										
4	L	94	1.1	0.129	10.0	LOS A	4	0.56	0.80	40.3
5	T	53	1.9	0.828	104.3	LOS F	34	0.98	1.26	14.2
6	R	16	5.9	0.850	105.7	LOS F	34	0.98	1.27	14.1
Approach		**164**	**1.8**	**0.833**	**50.4**	**LOS F**	**34**	**0.74**	**1.00**	**22.6**
High St (N)										
7	L	68	4.4	0.324	7.2	LOS A	22	0.31	0.59	42.2
8	T	512	5.1	0.324	0.6	LOS A	22	0.31	0.00	47.3
9	R	106	4.7	0.191	10.8	LOS B	6	0.53	0.82	39.7
Approach		**686**	**5.0**	**0.324**	**2.8**	**LOS A**	**22**	**0.34**	**0.18**	**45.4**
Pah St										
10	L	152	1.3	0.179	9.0	LOS A	6	0.50	0.78	41.1
11	T	24	4.0	1.389	466.1	LOS F	231	1.00	2.96	4.1
12	R	108	0.9	1.421	467.5	LOS F	231	1.00	2.97	4.1
Approach		**285**	**1.4**	**1.427**	**222.8**	**LOS F**	**231**	**0.73**	**1.80**	**7.8**
All Vehicles		**1927**	**2.9**	**1.421**	**39.9**	**Not Applicable**	**231**	**0.44**	**0.53**	**25.2**

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* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Pah_Gre Intersection DM

2029 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	193	6.8	0.362	7.8	LOS A	25	0.42	0.63	41.8
2	T	374	7.0	0.362	1.2	LOS A	25	0.42	0.00	46.4
3	R	140	7.1	0.380	16.9	LOS C	15	0.74	0.98	35.6
Approach		**706**	**6.9**	**0.381**	**6.1**	**LOS A**	**25**	**0.48**	**0.36**	**42.6**
Greenwood St										
4	L	113	2.7	0.185	11.4	LOS B	6	0.63	0.86	39.3
5	T	51	3.9	1.109	275.6	LOS F	83	1.00	1.68	6.5
6	R	16	6.2	1.143	277.0	LOS F	83	1.00	1.69	6.5
Approach		**179**	**3.4**	**1.117**	**110.5**	**LOS F**	**83**	**0.77**	**1.16**	**13.6**
High St (N)										
7	L	87	8.0	0.422	7.7	LOS A	35	0.42	0.61	41.8
8	T	652	8.0	0.423	1.1	LOS A	35	0.42	0.00	46.4
9	R	171	8.2	0.303	10.6	LOS B	11	0.52	0.83	40.0
Approach		**909**	**8.0**	**0.423**	**3.5**	**LOS A**	**35**	**0.44**	**0.21**	**44.6**
Pah St										
10	L	144	4.9	0.173	8.5	LOS A	5	0.45	0.73	41.6
11	T	94	5.3	3.760	2545.0	LOS F	871	1.00	4.15	0.8
12	R	141	5.0	3.711	2546.4	LOS F	871	1.00	4.17	0.8
Approach		**379**	**5.0**	**3.735**	**1581.8**	**LOS F**	**871**	**0.79**	**2.86**	**1.3**
All Vehicles		**2173**	**6.8**	**3.760**	**288.4**	**Not Applicable**	**871**	**0.54**	**0.80**	**6.3**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Pah_Gre Intersection Option 2

2019 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	145	6.9	0.231	7.5	LOS A	13	0.34	0.61	42.1
2	T	204	6.9	0.231	0.9	LOS A	13	0.34	0.00	47.0
3	R	104	6.7	0.208	11.7	LOS B	7	0.56	0.83	39.1
Approach		**453**	**6.8**	**0.231**	**5.5**	**LOS A**	**13**	**0.39**	**0.39**	**43.4**
Greenwood St										
4	L	97	3.1	0.139	10.3	LOS B	5	0.58	0.81	40.1
5	T	43	2.3	0.422	38.7	LOS E	14	0.91	1.03	25.9
6	R	14	7.1	0.424	40.1	LOS E	14	0.91	1.04	25.4
Approach		**154**	**3.2**	**0.422**	**20.9**	**LOS C**	**14**	**0.70**	**0.89**	**33.3**
High St (N)										
7	L	82	8.4	0.336	7.3	LOS A	24	0.31	0.59	42.2
8	T	500	8.0	0.336	0.7	LOS A	24	0.31	0.00	47.2
9	R	164	7.9	0.263	8.3	LOS A	8	0.36	0.67	41.8
Approach		**747**	**8.0**	**0.336**	**3.1**	**LOS A**	**24**	**0.32**	**0.21**	**45.3**
Pah St										
10	L	116	5.2	0.130	7.6	LOS A	3	0.34	0.64	42.1
11	T	76	5.3	1.310	335.3	LOS F	267	1.00	3.36	5.5
12	R	115	5.2	1.307	336.7	LOS F	267	1.00	3.39	5.5
Approach		**307**	**5.2**	**1.305**	**212.0**	**LOS F**	**267**	**0.75**	**2.34**	**8.2**
All Vehicles		**1661**	**6.7**	**1.310**	**44.0**	**Not Applicable**	**267**	**0.46**	**0.72**	**24.0**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Pah_Gre Intersection Option 2

2029 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	195	7.2	0.311	7.7	LOS A	20	0.38	0.62	41.9
2	T	274	6.9	0.311	1.1	LOS A	20	0.38	0.00	46.7
3	R	140	7.1	0.308	13.6	LOS B	12	0.64	0.91	37.8
Approach		**609**	**7.1**	**0.311**	**6.0**	**LOS A**	**20**	**0.44**	**0.41**	**42.8**
Greenwood St										
4	L	122	3.3	0.183	10.8	LOS B	7	0.60	0.84	39.8
5	T	55	3.6	0.821	95.4	LOS F	33	0.98	1.25	15.1
6	R	18	5.6	0.818	96.7	LOS F	33	0.98	1.26	15.0
Approach		**195**	**3.6**	**0.817**	**42.6**	**LOS E**	**33**	**0.74**	**1.00**	**24.7**
High St (N)										
7	L	88	8.0	0.367	7.6	LOS A	28	0.39	0.61	41.9
8	T	545	8.1	0.367	1.0	LOS A	28	0.39	0.00	46.6
9	R	168	7.7	0.279	9.0	LOS A	8	0.43	0.72	41.2
Approach		**802**	**8.0**	**0.367**	**3.4**	**LOS A**	**28**	**0.40**	**0.22**	**44.8**
Pah St										
10	L	128	4.7	0.148	8.0	LOS A	4	0.40	0.68	41.9
11	T	84	4.8	2.100	1067.5	LOS F	564	1.00	4.45	1.9
12	R	126	4.8	2.100	1068.9	LOS F	564	1.00	4.47	1.9
Approach		**338**	**4.7**	**2.116**	**666.8**	**LOS F**	**564**	**0.77**	**3.03**	**2.9**
All Vehicles		**1944**	**6.7**	**2.100**	**123.5**	**Not Applicable**	**564**	**0.51**	**0.84**	**12.5**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Pah_Gre Intersection Option 2

2019 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	217	1.8	0.373	7.1	LOS A	25	0.32	0.59	42.2
2	T	397	2.0	0.373	0.7	LOS A	25	0.32	0.00	47.2
3	R	108	1.9	0.179	10.0	LOS B	6	0.50	0.79	40.3
Approach		**722**	**1.9**	**0.373**	**4.0**	**LOS A**	**25**	**0.34**	**0.29**	**44.5**
Greenwood St										
4	L	94	1.1	0.116	9.3	LOS A	4	0.53	0.75	40.9
5	T	53	1.9	0.589	51.3	LOS F	20	0.94	1.10	22.3
6	R	16	5.9	0.586	52.7	LOS F	20	0.94	1.11	22.0
Approach		**164**	**1.8**	**0.590**	**27.4**	**LOS D**	**20**	**0.70**	**0.90**	**30.1**
High St (N)										
7	L	72	5.6	0.276	7.1	LOS A	18	0.29	0.58	42.3
8	T	416	5.0	0.276	0.6	LOS A	18	0.29	0.00	47.4
9	R	107	4.7	0.172	9.9	LOS A	6	0.48	0.77	40.5
Approach		**595**	**5.0**	**0.276**	**3.0**	**LOS A**	**18**	**0.32**	**0.21**	**45.4**
Pah St										
10	L	144	0.7	0.172	8.5	LOS A	5	0.47	0.74	41.5
11	T	23	4.2	0.960	108.5	LOS F	67	0.99	1.68	13.8
12	R	103	1.0	0.963	109.8	LOS F	67	0.99	1.69	13.7
Approach		**271**	**1.1**	**0.967**	**55.9**	**LOS F**	**67**	**0.71**	**1.18**	**21.3**
All Vehicles		**1752**	**2.9**	**0.963**	**13.9**	**Not Applicable**	**67**	**0.43**	**0.46**	**36.9**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Pah_Gre Intersection Option 2

2029 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	245	2.0	0.420	7.3	LOS A	30	0.37	0.59	42.0
2	T	442	2.0	0.421	0.8	LOS A	30	0.37	0.00	46.8
3	R	131	2.3	0.289	13.4	LOS B	10	0.64	0.90	37.8
Approach		**818**	**2.1**	**0.421**	**4.8**	**LOS A**	**30**	**0.41**	**0.32**	**43.6**
Greenwood St										
4	L	111	0.9	0.163	10.6	LOS B	6	0.59	0.84	39.9
5	T	62	1.6	1.240	352.9	LOS F	123	1.00	2.07	5.2
6	R	19	5.0	1.250	354.3	LOS F	123	1.00	2.11	5.2
Approach		**192**	**1.6**	**1.245**	**156.9**	**LOS F**	**123**	**0.77**	**1.37**	**10.4**
High St (N)										
7	L	78	5.1	0.371	7.4	LOS A	27	0.36	0.60	42.0
8	T	586	4.9	0.372	0.8	LOS A	27	0.36	0.00	46.8
9	R	121	5.0	0.209	10.5	LOS B	7	0.52	0.81	40.0
Approach		**785**	**5.0**	**0.372**	**3.0**	**LOS A**	**27**	**0.39**	**0.18**	**45.1**
Pah St										
10	L	184	1.1	0.215	9.0	LOS A	7	0.51	0.79	41.1
11	T	29	3.3	2.143	1141.4	LOS F	443	1.00	3.70	1.7
12	R	132	0.8	2.183	1142.8	LOS F	443	1.00	3.71	1.7
Approach		**345**	**1.2**	**2.179**	**538.0**	**LOS F**	**443**	**0.74**	**2.15**	**3.6**
All Vehicles		**2140**	**2.9**	**2.183**	**103.7**	**Not Applicable**	**443**	**0.49**	**0.66**	**14.2**

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Following Degree of Saturation
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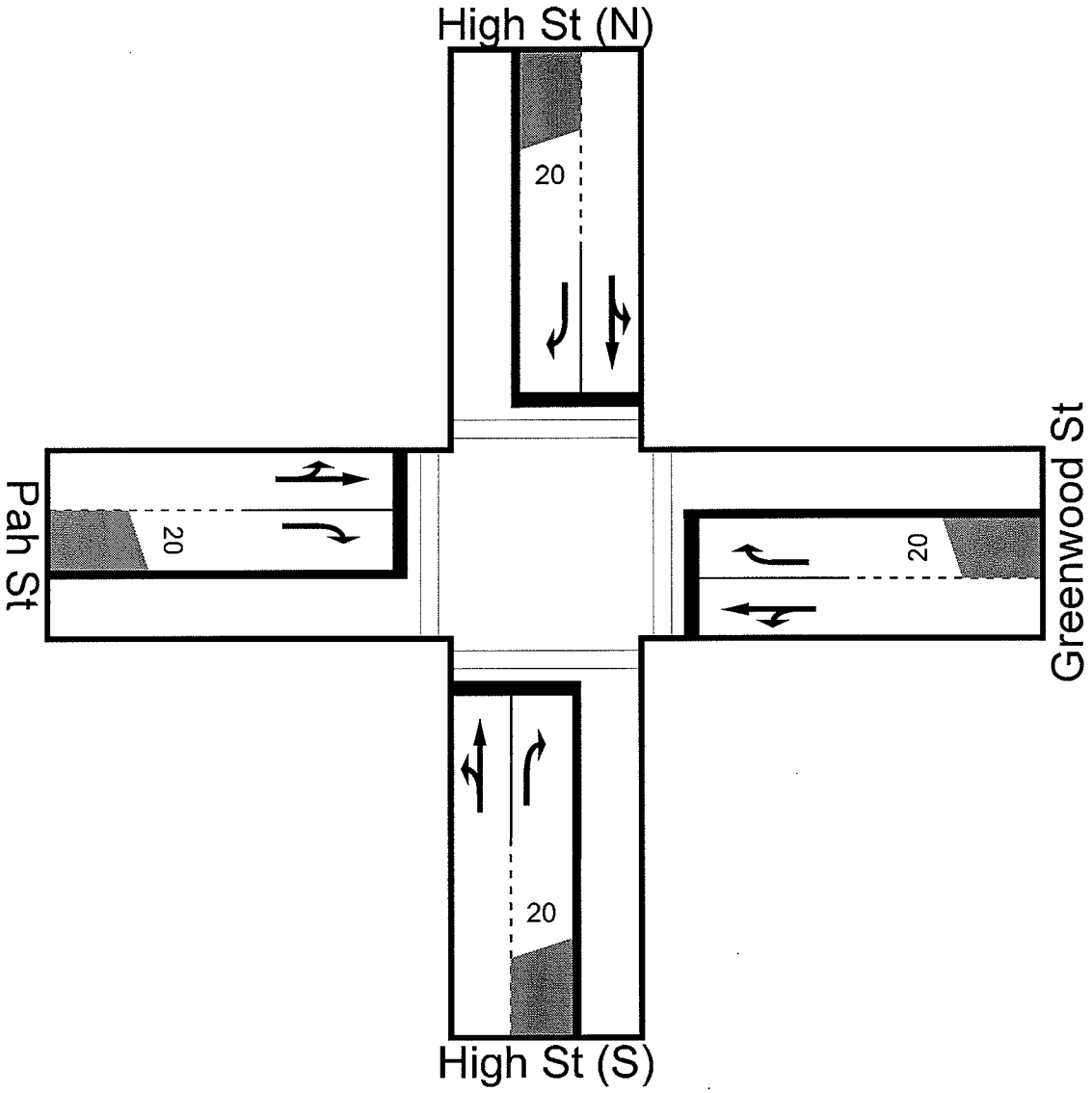
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements


High St (N)
20
Pah St
20
20
Greenwood St
20
High St (S)

SIDRA INTERSECTION

Movement Summary

Pah_Gre Signals Option

2009 AM Peak

Signalised - Fixed time **Cycle Time = 60 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	94	7.4	0.407	20.8	LOS C	56	0.76	0.79	33.4
2	T	182	7.1	0.408	14.2	LOS B	56	0.76	0.65	37.2
3	R	68	7.2	0.411	26.0	LOS C	18	0.81	0.75	30.8
Approach		**345**	**7.2**	**0.412**	**18.4**	**LOS B**	**56**	**0.77**	**0.70**	**34.7**
Greenwood St										
4	L	59	3.4	0.469	36.3	LOS D	27	0.98	0.76	26.7
5	T	26	3.7	0.469	29.8	LOS C	27	0.98	0.75	29.0
6	R	8	11.1	0.065	35.5	LOS D	3	0.95	0.66	27.0
Approach		**95**	**4.2**	**0.469**	**34.4**	**LOS C**	**27**	**0.98**	**0.75**	**27.3**
High St (N)										
7	L	46	8.5	0.549	21.8	LOS C	80	0.82	0.82	32.9
8	T	345	8.1	0.549	15.2	LOS B	80	0.82	0.71	36.5
9	R	91	7.8	0.483	22.6	LOS C	21	0.75	0.74	32.5
Approach		**483**	**8.1**	**0.548**	**17.2**	**LOS B**	**80**	**0.81**	**0.72**	**35.3**
Pah St										
10	L	66	4.5	0.554	36.7	LOS D	33	0.99	0.79	26.6
11	T	43	4.7	0.553	30.1	LOS C	33	0.99	0.79	28.9
12	R	65	4.6	0.449	36.0	LOS D	20	0.97	0.75	26.8
Approach		**174**	**4.6**	**0.554**	**34.8**	**LOS C**	**33**	**0.99**	**0.77**	**27.2**
All Vehicles		**1097**	**6.9**	**0.554**	**21.9**	**LOS C**	**80**	**0.84**	**0.73**	**32.8**

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate

SIDRA INTERSECTION

Movement Summary

Pah_Gre Signals Option

2019 AM Peak

Signalised - Fixed time **Cycle Time = 70 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	151	7.3	0.599	22.8	LOS C	98	0.81	0.83	32.4
2	T	294	7.1	0.600	16.2	LOS B	98	0.81	0.71	35.9
3	R	111	7.2	0.834	45.2	LOS D	43	0.93	1.03	24.0
Approach		**556**	**7.2**	**0.834**	**23.8**	**LOS C**	**98**	**0.83**	**0.81**	**31.8**
Greenwood St										
4	L	97	3.1	0.645	40.6	LOS D	47	1.00	0.85	25.3
5	T	43	2.3	0.644	34.1	LOS C	47	1.00	0.84	27.4
6	R	14	7.1	0.111	39.0	LOS D	5	0.93	0.68	25.8
Approach		**154**	**3.2**	**0.645**	**38.6**	**LOS D**	**47**	**0.99**	**0.83**	**25.9**
High St (N)										
7	L	72	8.3	0.760	26.4	LOS C	146	0.90	0.92	30.7
8	T	535	8.0	0.761	19.7	LOS B	146	0.90	0.86	33.8
9	R	140	7.9	0.882	34.1	LOS C	44	0.82	0.88	27.5
Approach		**747**	**8.0**	**0.883**	**23.1**	**LOS C**	**146**	**0.89**	**0.87**	**32.1**
Pah St										
10	L	105	4.8	0.728	41.8	LOS D	58	1.00	0.90	24.9
11	T	68	4.4	0.727	35.3	LOS D	58	1.00	0.90	27.0
12	R	103	4.9	0.805	44.9	LOS D	38	0.98	0.96	24.0
Approach		**276**	**4.7**	**0.805**	**41.4**	**LOS D**	**58**	**0.99**	**0.92**	**25.0**
All Vehicles		**1733**	**6.8**	**0.882**	**27.6**	**LOS C**	**146**	**0.90**	**0.85**	**30.0**

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate

SIDRA INTERSECTION

Movement Summary

Pah_Gre Signals Option

2029 AM Peak

Signalised - Fixed time **Cycle Time = 110 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	193	6.8	0.667	25.7	LOS C	176	0.77	0.84	31.0
2	T	374	6.2	0.667	19.1	LOS B	176	0.77	0.70	34.2
3	R	140	10.7	1.000#	47.2	LOS D	44	0.94	0.80	23.4
Approach		**706**	**6.9**	**1.000**	**24.6**	**LOS C**	**176**	**0.79**	**0.75**	**31.4**
Greenwood St										
4	L	113	2.7	0.572	52.8	LOS D	71	0.97	0.81	22.0
5	T	51	3.9	0.572	46.3	LOS D	71	0.97	0.79	23.6
6	R	16	6.2	0.182	52.3	LOS D	9	0.90	0.69	22.1
Approach		**179**	**3.4**	**0.572**	**50.9**	**LOS D**	**71**	**0.96**	**0.80**	**22.5**
High St (N)										
7	L	87	8.0	0.801	28.8	LOS C	255	0.88	0.89	29.6
8	T	652	7.4	0.802	22.2	LOS C	255	0.88	0.81	32.5
9	R	171	11.8	1.000#	39.2	LOS D	44	0.97	0.81	25.8
Approach		**909**	**8.0**	**1.000**	**25.1**	**LOS C**	**255**	**0.89**	**0.82**	**31.2**
Pah St										
10	L	144	4.9	0.919	72.2	LOS E	143	1.00	1.14	18.3
11	T	94	3.5	0.919	65.7	LOS E	143	1.00	1.14	19.3
12	R	141	7.7	1.000#	52.6	LOS D	44	0.94	0.77	22.1
Approach		**379**	**5.0**	**1.000**	**65.0**	**LOS E**	**143**	**0.99**	**1.05**	**19.5**
All Vehicles		**2173**	**6.8**	**1.000**	**34.0**	**LOS C**	**255**	**0.88**	**0.83**	**27.5**

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate

SIDRA INTERSECTION

Movement Summary

Pah_Gre Signals Option

2009 PM Peak

Signalised - Fixed time **Cycle Time = 60 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	134	2.2	0.605	22.1	LOS C	84	0.84	0.83	32.6
2	T	296	2.0	0.605	15.7	LOS B	84	0.84	0.73	36.2
3	R	69	1.4	0.391	25.8	LOS C	17	0.81	0.74	30.9
Approach		**499**	**2.0**	**0.605**	**18.8**	**LOS B**	**84**	**0.84**	**0.76**	**34.4**
Greenwood St										
4	L	62	1.6	0.556	36.9	LOS D	30	0.99	0.79	26.5
5	T	35	2.9	0.556	30.4	LOS C	30	0.99	0.79	28.8
6	R	11	9.1	0.077	34.3	LOS C	4	0.93	0.67	27.4
Approach		**108**	**2.8**	**0.556**	**34.5**	**LOS C**	**30**	**0.99**	**0.78**	**27.3**
High St (N)										
7	L	46	4.3	0.535	21.6	LOS C	77	0.81	0.82	32.9
8	T	346	4.9	0.535	15.1	LOS B	77	0.81	0.70	36.6
9	R	72	5.6	0.410	24.9	LOS C	18	0.80	0.74	31.3
Approach		**464**	**5.0**	**0.535**	**17.3**	**LOS B**	**77**	**0.81**	**0.72**	**35.3**
Pah St										
10	L	100	1.0	0.566	36.5	LOS D	35	1.00	0.80	26.6
11	T	16	5.9	0.567	30.1	LOS C	35	1.00	0.79	28.9
12	R	72	1.4	0.489	37.0	LOS D	22	0.99	0.75	26.4
Approach		**189**	**1.6**	**0.566**	**36.1**	**LOS D**	**35**	**0.99**	**0.78**	**26.7**
All Vehicles		**1260**	**3.1**	**0.605**	**22.2**	**LOS C**	**84**	**0.86**	**0.75**	**32.6**

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate

SIDRA INTERSECTION

Movement Summary

Pah_Gre Signals Option

2019 PM Peak

Signalised - Fixed time **Cycle Time = 70 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	213	1.9	0.854	33.3	LOS C	181	0.96	1.05	27.8
2	T	471	1.9	0.855	26.8	LOS C	181	0.96	1.03	30.3
3	R	111	1.8	0.770	39.2	LOS D	38	0.90	0.95	25.7
Approach		**792**	**1.9**	**0.854**	**30.2**	**LOS C**	**181**	**0.96**	**1.03**	**28.9**
Greenwood St										
4	L	94	1.1	0.679	41.1	LOS D	49	1.00	0.87	25.1
5	T	53	1.9	0.679	34.6	LOS C	49	1.00	0.87	27.2
6	R	16	5.9	0.130	36.7	LOS D	6	0.91	0.69	26.5
Approach		**164**	**1.8**	**0.679**	**38.5**	**LOS D**	**49**	**0.99**	**0.85**	**25.9**
High St (N)										
7	L	68	4.4	0.712	24.2	LOS C	128	0.87	0.86	31.6
8	T	512	5.1	0.713	17.7	LOS B	128	0.87	0.79	35.0
9	R	106	4.7	0.752	38.1	LOS D	36	0.89	0.93	26.1
Approach		**686**	**5.0**	**0.752**	**21.5**	**LOS C**	**128**	**0.88**	**0.82**	**32.9**
Pah St										
10	L	152	1.3	0.747	42.2	LOS D	58	1.00	0.91	24.8
11	T	24	4.0	0.748	35.8	LOS D	58	1.00	0.91	26.8
12	R	108	0.9	0.824	45.9	LOS D	39	0.99	0.98	23.7
Approach		**285**	**1.4**	**0.824**	**43.0**	**LOS D**	**58**	**1.00**	**0.94**	**24.5**
All Vehicles		**1927**	**2.9**	**0.855**	**29.7**	**LOS C**	**181**	**0.94**	**0.92**	**29.1**

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate

SIDRA INTERSECTION

Movement Summary

Pah_Gre Signals Option

2029 PM Peak

Signalised - Fixed time **Cycle Time = 125 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	265	1.9	0.851	32.1	LOS C	325	0.90	0.92	28.2
2	T	586	1.9	0.851	25.6	LOS C	325	0.90	0.86	30.9
3	R	138	3.0	1.001	46.5	LOS D	43	0.96	0.81	23.6
Approach		**990**	**2.0**	**1.000**	**29.5**	**LOS C**	**325**	**0.91**	**0.87**	**29.2**
Greenwood St										
4	L	111	0.9	0.610	59.5	LOS E	82	0.98	0.82	20.5
5	T	62	1.6	0.609	53.1	LOS D	82	0.98	0.80	21.9
6	R	19	5.0	0.245	55.2	LOS E	12	0.88	0.70	21.5
Approach		**192**	**1.6**	**0.610**	**57.0**	**LOS E**	**82**	**0.97**	**0.80**	**21.0**
High St (N)										
7	L	82	4.9	0.678	25.5	LOS C	219	0.75	0.84	31.0
8	T	614	4.8	0.679	19.0	LOS B	219	0.75	0.68	34.2
9	R	126	6.3	1.000#	48.1	LOS D	44	0.96	0.80	23.2
Approach		**822**	**5.0**	**1.000**	**23.0**	**LOS C**	**219**	**0.77**	**0.71**	**32.1**
Pah St										
10	L	195	1.0	0.982	101.6	LOS F	171	1.00	1.27	14.5
11	T	31	1.1	0.982	95.2	LOS F	171	1.00	1.27	15.1
12	R	140	1.2	1.000#	59.5	LOS E	43	0.95	0.76	20.5
Approach		**366**	**1.1**	**1.000**	**90.6**	**LOS F**	**171**	**0.99**	**1.16**	**15.7**
All Vehicles		**2370**	**2.9**	**1.001**	**38.9**	**LOS D**	**325**	**0.88**	**0.86**	**25.8**

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate

SIDRA INTERSECTION

Movement Summary

Pah_Gre Signals Option

2019 AM Peak

Signalised - Fixed time **Cycle Time = 65 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	145	6.9	0.519	22.2	LOS C	75	0.79	0.81	32.7
2	T	204	6.9	0.519	15.6	LOS B	75	0.79	0.69	36.3
3	R	104	6.7	0.741	37.9	LOS D	35	0.94	0.92	26.2
Approach		**453**	**6.8**	**0.742**	**22.8**	**LOS C**	**75**	**0.83**	**0.78**	**32.3**
Greenwood St										
4	L	97	3.1	0.669	39.0	LOS D	45	1.00	0.86	25.8
5	T	43	2.3	0.669	32.5	LOS C	45	1.00	0.86	28.0
6	R	14	7.1	0.105	37.4	LOS D	5	0.94	0.68	26.3
Approach		**154**	**3.2**	**0.669**	**37.1**	**LOS D**	**45**	**0.99**	**0.85**	**26.4**
High St (N)										
7	L	82	8.4	0.780	27.6	LOS C	140	0.93	0.95	30.1
8	T	500	8.0	0.781	21.0	LOS C	140	0.93	0.91	33.2
9	R	164	7.9	0.946	29.9	LOS C	44	0.89	0.83	29.1
Approach		**747**	**8.0**	**0.946**	**23.7**	**LOS C**	**140**	**0.92**	**0.90**	**31.8**
Pah St										
10	L	116	5.2	0.832	43.2	LOS D	63	1.00	1.01	24.5
11	T	76	5.3	0.831	36.6	LOS D	63	1.00	1.01	26.5
12	R	115	5.2	0.851	45.0	LOS D	41	1.00	1.02	24.0
Approach		**307**	**5.2**	**0.851**	**42.2**	**LOS D**	**63**	**1.00**	**1.01**	**24.8**
All Vehicles		**1661**	**6.7**	**0.946**	**28.1**	**LOS C**	**140**	**0.92**	**0.88**	**29.8**

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate

SIDRA INTERSECTION

Movement Summary

Pah_Gre Signals Option

2029 AM Peak

Signalised - Fixed time **Cycle Time = 80 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	195	7.2	0.648	24.5	LOS C	119	0.82	0.84	31.5
2	T	274	6.5	0.647	17.9	LOS B	119	0.82	0.73	34.9
3	R	140	8.4	0.999#	38.1	LOS D	44	0.93	0.80	26.1
Approach		**609**	**7.1**	**1.000**	**24.0**	**LOS C**	**119**	**0.84**	**0.78**	**31.7**
Greenwood St										
4	L	122	3.3	0.683	44.0	LOS D	63	1.00	0.87	24.3
5	T	55	3.6	0.682	37.5	LOS D	63	1.00	0.87	26.2
6	R	18	5.6	0.155	41.3	LOS D	7	0.91	0.69	25.1
Approach		**195**	**3.6**	**0.683**	**41.9**	**LOS D**	**63**	**0.99**	**0.85**	**24.9**
High St (N)										
7	L	88	8.0	0.792	29.1	LOS C	178	0.91	0.93	29.5
8	T	545	7.8	0.790	22.5	LOS C	178	0.91	0.88	32.4
9	R	168	8.9	1.000#	32.7	LOS C	44	0.96	0.80	28.0
Approach		**802**	**8.0**	**1.000**	**25.1**	**LOS C**	**178**	**0.92**	**0.87**	**31.2**
Pah St										
10	L	128	4.7	0.771	45.6	LOS D	79	1.00	0.94	23.9
11	T	84	4.3	0.771	39.1	LOS D	79	1.00	0.94	25.7
12	R	126	5.1	1.000#	42.9	LOS D	44	0.97	0.78	24.6
Approach		**338**	**4.7**	**1.000**	**42.9**	**LOS D**	**79**	**0.99**	**0.88**	**24.6**
All Vehicles		**1944**	**6.7**	**1.000**	**29.5**	**LOS C**	**178**	**0.92**	**0.84**	**29.2**

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate

SIDRA INTERSECTION

Movement Summary

Pah_Gre Signals Option

2019 PM Peak

Signalised - Fixed time **Cycle Time = 70 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	217	1.8	0.784	27.5	LOS C	145	0.92	0.94	30.1
2	T	397	2.0	0.784	21.0	LOS C	145	0.92	0.89	33.1
3	R	108	1.9	0.697	32.6	LOS C	33	0.83	0.88	28.0
Approach		**722**	**1.9**	**0.783**	**24.7**	**LOS C**	**145**	**0.90**	**0.90**	**31.3**
Greenwood St										
4	L	94	1.1	0.674	41.0	LOS D	48	1.00	0.86	25.2
5	T	53	1.9	0.675	34.5	LOS C	48	1.00	0.86	27.2
6	R	16	5.9	0.130	36.7	LOS D	6	0.91	0.69	26.5
Approach		**164**	**1.8**	**0.674**	**38.4**	**LOS D**	**48**	**0.99**	**0.85**	**25.9**
High St (N)										
7	L	72	5.6	0.609	22.7	LOS C	104	0.82	0.83	32.4
8	T	416	5.0	0.608	16.2	LOS B	104	0.82	0.72	35.9
9	R	107	4.7	0.714	34.0	LOS C	34	0.84	0.89	27.5
Approach		**595**	**5.0**	**0.714**	**20.2**	**LOS C**	**104**	**0.82**	**0.76**	**33.6**
Pah St										
10	L	144	0.7	0.709	41.3	LOS D	54	1.00	0.88	25.1
11	T	23	4.2	0.710	34.9	LOS C	54	1.00	0.88	27.1
12	R	103	1.0	0.786	44.2	LOS D	37	0.99	0.94	24.2
Approach		**271**	**1.1**	**0.786**	**41.8**	**LOS D**	**54**	**0.99**	**0.90**	**24.9**
All Vehicles		**1752**	**2.9**	**0.786**	**27.1**	**LOS C**	**145**	**0.90**	**0.85**	**30.2**

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate

SIDRA INTERSECTION

Movement Summary

Pah_Gre Signals Option

2029 PM Peak

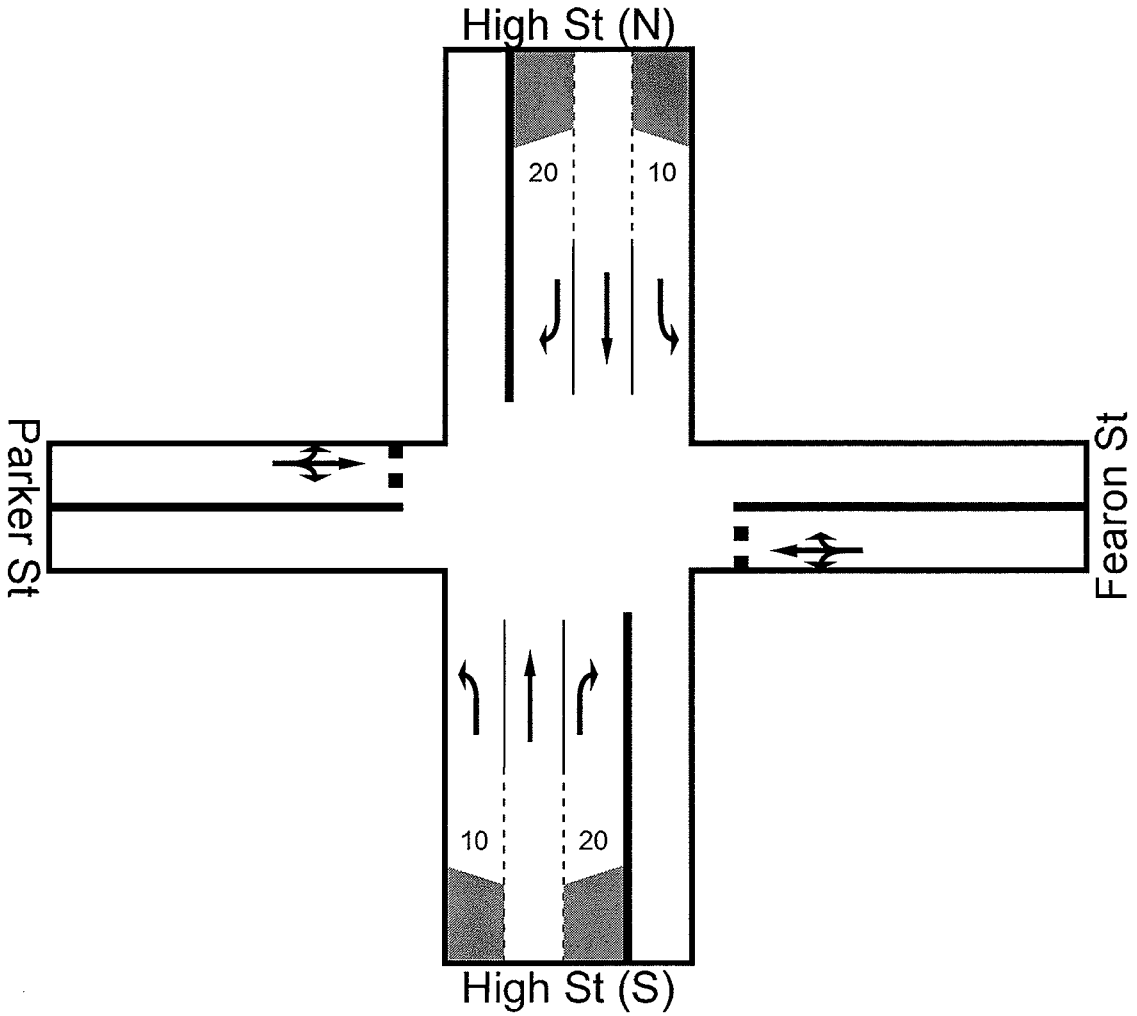
Signalised - Fixed time **Cycle Time = 95 seconds**

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	245	2.0	0.780	27.6	LOS C	194	0.88	0.89	30.0
2	T	442	2.0	0.780	21.2	LOS C	194	0.88	0.82	33.1
3	R	131	2.6	1.000#	40.5	LOS D	43	0.94	0.80	25.3
Approach		**818**	**2.1**	**1.000**	**25.8**	**LOS C**	**194**	**0.88**	**0.84**	**30.8**
Greenwood St										
4	L	111	0.9	0.640	48.8	LOS D	67	0.99	0.83	23.0
5	T	62	1.6	0.640	42.4	LOS D	67	0.99	0.83	24.7
6	R	19	5.0	0.192	44.1	LOS D	9	0.88	0.70	24.2
Approach		**192**	**1.6**	**0.640**	**46.2**	**LOS D**	**67**	**0.98**	**0.82**	**23.6**
High St (N)										
7	L	78	5.1	0.701	25.3	LOS C	173	0.82	0.85	31.1
8	T	586	4.9	0.702	18.7	LOS B	173	0.82	0.74	34.4
9	R	121	5.0	0.976	39.2	LOS D	44	0.93	0.81	25.7
Approach		**785**	**5.0**	**0.977**	**22.5**	**LOS C**	**173**	**0.84**	**0.76**	**32.4**
Pah St										
10	L	184	1.1	0.837	55.4	LOS E	97	1.00	1.01	21.4
11	T	29	1.8	0.837	49.0	LOS D	97	1.00	1.01	22.9
12	R	132	1.0	1.000#	48.2	LOS D	43	0.96	0.77	23.1
Approach		**345**	**1.2**	**1.000**	**52.2**	**LOS D**	**97**	**0.99**	**0.94**	**22.1**
All Vehicles		**2140**	**2.9**	**1.000**	**30.7**	**LOS C**	**194**	**0.89**	**0.82**	**28.7**

Pedestrian Movements

Mov ID	Dem Flow (ped/h)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate


High St (N)
20
10
Parker St
Fearon St
10
20
High St (S)

SIDRA INTERSECTION

Movement Summary

Par_Fea Intersection DM

2009 AM Peak 07:45-08:45

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	23	13.6	0.037	6.4	LOS A	1	0.08	0.53	43.4
2	T	301	14.0	0.168	0.0	LOS A	0	0.00	0.00	50.0
3	R	20	15.0	0.039	11.1	LOS B	1	0.49	0.75	39.7
Approach		**343**	**14.0**	**0.168**	**1.1**	**LOS A**	**1**	**0.03**	**0.08**	**48.8**
Fearon St										
4	L	39	5.0	0.132	12.4	LOS B	4	0.56	0.76	38.6
5	T	1	50.0	0.133	11.0	LOS B	4	0.56	0.79	39.5
6	R	18	5.6	0.132	12.4	LOS B	4	0.56	0.82	38.6
Approach		**60**	**6.7**	**0.132**	**12.3**	**LOS B**	**4**	**0.56**	**0.78**	**38.6**
High St (N)										
7	L	5	20.0	0.009	6.3	LOS A	0	0.09	0.53	43.4
8	T	417	7.9	0.224	0.0	LOS A	0	0.00	0.00	50.0
9	R	14	7.1	0.024	9.2	LOS A	1	0.40	0.67	41.1
Approach		**435**	**8.0**	**0.224**	**0.4**	**LOS A**	**1**	**0.01**	**0.03**	**49.6**
Parker St										
10	L	24	4.3	0.148	13.9	LOS B	5	0.58	0.73	37.6
11	T	10	10.0	0.147	12.6	LOS B	5	0.58	0.80	38.5
12	R	25	4.0	0.148	13.8	LOS B	5	0.58	0.83	37.6
Approach		**58**	**5.2**	**0.148**	**13.6**	**LOS B**	**5**	**0.58**	**0.78**	**37.7**
All Vehicles		**896**	**10.0**	**0.224**	**2.3**	**Not Applicable**	**5**	**0.09**	**0.15**	**47.4**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Par_Fea Intersection DM

2019 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	28	14.3	0.048	6.4	LOS A	1	0.10	0.53	43.3
2	T	395	14.0	0.220	0.0	LOS A	0	0.00	0.00	50.0
3	R	22	13.6	0.054	13.1	LOS B	2	0.58	0.83	38.3
Approach		**444**	**14.0**	**0.220**	**1.0**	**LOS A**	**2**	**0.03**	**0.07**	**48.8**
Fearon St										
4	L	40	5.0	0.192	16.3	LOS C	6	0.68	0.87	36.0
5	T	1	50.0	0.200	14.9	LOS B	6	0.68	0.85	36.7
6	R	19	5.3	0.192	16.3	LOS C	6	0.68	0.88	36.0
Approach		**61**	**6.6**	**0.192**	**16.3**	**LOS C**	**6**	**0.68**	**0.87**	**36.0**
High St (N)										
7	L	3	25.0	0.008	6.3	LOS A	0	0.09	0.53	43.4
8	T	539	8.0	0.291	0.0	LOS A	0	0.00	0.00	50.0
9	R	17	6.2	0.028	10.2	LOS B	1	0.47	0.72	40.3
Approach		**559**	**8.1**	**0.291**	**0.3**	**LOS A**	**1**	**0.01**	**0.02**	**49.6**
Parker St										
10	L	25	7.7	0.280	20.7	LOS C	9	0.74	0.91	33.5
11	T	13	7.7	0.277	19.4	LOS C	9	0.74	0.91	34.1
12	R	34	5.9	0.279	20.6	LOS C	9	0.74	0.93	33.5
Approach		**73**	**6.8**	**0.279**	**20.4**	**LOS C**	**9**	**0.74**	**0.92**	**33.6**
All Vehicles		**1137**	**10.2**	**0.291**	**2.8**	**Not Applicable**	**9**	**0.10**	**0.15**	**46.9**

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Following Degree of Saturation
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* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Par_Fea Intersection DM

2029 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	37	13.5	0.062	6.4	LOS A	1	0.12	0.52	43.3
2	T	514	14.0	0.288	0.0	LOS A	0	0.00	0.00	50.0
3	R	28	14.3	0.087	15.9	LOS C	3	0.68	0.89	36.4
Approach		**579**	**14.0**	**0.288**	**1.2**	**LOS A**	**3**	**0.04**	**0.08**	**48.6**
Fearon St										
4	L	42	4.8	0.313	25.7	LOS D	10	0.80	0.98	30.9
5	T	1	50.0	0.333	24.3	LOS C	10	0.80	0.95	31.5
6	R	20	5.0	0.312	25.7	LOS D	10	0.80	0.97	30.9
Approach		**64**	**6.2**	**0.312**	**25.6**	**LOS D**	**10**	**0.80**	**0.98**	**31.0**
High St (N)										
7	L	4	20.0	0.009	6.3	LOS A	0	0.11	0.53	43.3
8	T	647	8.0	0.350	0.0	LOS A	0	0.00	0.00	50.0
9	R	20	10.0	0.046	12.5	LOS B	1	0.57	0.82	38.6
Approach		**673**	**8.2**	**0.350**	**0.4**	**LOS A**	**1**	**0.02**	**0.03**	**49.5**
Parker St										
10	L	34	5.9	0.576	39.6	LOS E	22	0.88	1.15	25.6
11	T	17	5.9	0.586	38.3	LOS E	22	0.88	1.09	26.0
12	R	44	6.7	0.577	39.6	LOS E	22	0.88	1.09	25.6
Approach		**96**	**6.2**	**0.576**	**39.4**	**LOS E**	**22**	**0.88**	**1.11**	**25.7**
All Vehicles		**1412**	**10.3**	**0.586**	**4.5**	**Not Applicable**	**22**	**0.12**	**0.16**	**45.1**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Par_Fea Intersection DM

2009 PM Peak 16:15-17:15

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	34	5.9	0.051	6.2	LOS A	1	0.13	0.51	43.2
2	T	313	6.1	0.167	0.0	LOS A	0	0.00	0.00	50.0
3	R	43	7.0	0.073	10.1	LOS B	2	0.47	0.75	40.3
Approach		**390**	**6.2**	**0.167**	**1.7**	**LOS A**	**2**	**0.06**	**0.13**	**48.1**
Fearon St										
4	L	38	5.3	0.224	14.1	LOS B	7	0.62	0.81	37.4
5	T	10	10.0	0.222	12.8	LOS B	7	0.62	0.83	38.3
6	R	41	4.9	0.223	14.1	LOS B	7	0.62	0.86	37.4
Approach		**89**	**5.6**	**0.223**	**14.0**	**LOS B**	**7**	**0.62**	**0.83**	**37.5**
High St (N)										
7	L	9	11.1	0.015	6.3	LOS A	0	0.12	0.53	43.2
8	T	400	8.0	0.216	0.0	LOS A	0	0.00	0.00	50.0
9	R	10	10.0	0.018	9.2	LOS A	0	0.40	0.66	41.1
Approach		**419**	**8.1**	**0.216**	**0.4**	**LOS A**	**0**	**0.01**	**0.03**	**49.6**
Parker St										
10	L	18	11.1	0.167	15.5	LOS C	5	0.64	0.76	36.6
11	T	10	10.0	0.167	14.2	LOS B	5	0.64	0.82	37.4
12	R	28	10.7	0.167	15.5	LOS C	5	0.64	0.86	36.6
Approach		**56**	**10.7**	**0.166**	**15.3**	**LOS C**	**5**	**0.64**	**0.82**	**36.7**
All Vehicles		**954**	**7.2**	**0.224**	**3.0**	**Not Applicable**	**7**	**0.13**	**0.19**	**46.6**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Par_Fea Intersection DM

2019 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	58	5.3	0.085	6.3	LOS A	2	0.20	0.48	42.9
2	T	453	6.0	0.241	0.0	LOS A	0	0.00	0.00	50.0
3	R	63	6.3	0.123	11.4	LOS B	4	0.53	0.83	39.3
Approach		**572**	**5.9**	**0.241**	**1.9**	**LOS A**	**4**	**0.08**	**0.14**	**47.8**
Fearon St										
4	L	45	4.4	0.500	25.1	LOS D	20	0.81	1.09	31.2
5	T	12	8.3	0.500	23.8	LOS C	20	0.81	1.03	31.8
6	R	71	5.6	0.500	25.1	LOS D	20	0.81	1.04	31.2
Approach		**128**	**5.5**	**0.499**	**25.0**	**LOS C**	**20**	**0.81**	**1.06**	**31.3**
High St (N)										
7	L	12	8.3	0.019	6.4	LOS A	0	0.15	0.52	43.1
8	T	489	8.0	0.264	0.0	LOS A	0	0.00	0.00	50.0
9	R	11	9.1	0.021	10.7	LOS B	1	0.49	0.72	39.9
Approach		**512**	**8.0**	**0.264**	**0.4**	**LOS A**	**1**	**0.01**	**0.03**	**49.5**
Parker St										
10	L	18	11.1	0.220	22.1	LOS C	7	0.77	0.93	32.8
11	T	9	10.0	0.222	20.8	LOS C	7	0.77	0.91	33.4
12	R	22	9.1	0.220	22.1	LOS C	7	0.77	0.93	32.8
Approach		**50**	**10.0**	**0.220**	**21.8**	**LOS C**	**7**	**0.77**	**0.93**	**32.9**
All Vehicles		**1262**	**6.9**	**0.500**	**4.4**	**Not Applicable**	**20**	**0.15**	**0.22**	**45.2**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Par_Fea Intersection DM

2029 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	73	5.6	0.108	6.3	LOS A	2	0.25	0.47	42.7
2	T	567	6.0	0.302	0.0	LOS A	0	0.00	0.00	50.0
3	R	79	6.3	0.185	13.3	LOS B	6	0.63	0.87	38.0
Approach		**718**	**6.0**	**0.302**	**2.1**	**LOS A**	**6**	**0.09**	**0.14**	**47.5**
Fearon St										
4	L	52	5.8	0.839	58.9	LOS F	46	0.93	1.53	20.7
5	T	13	7.7	0.812	57.6	LOS F	46	0.93	1.38	20.9
6	R	80	5.0	0.833	58.8	LOS F	46	0.93	1.38	20.7
Approach		**145**	**5.5**	**0.834**	**58.7**	**LOS F**	**46**	**0.93**	**1.43**	**20.7**
High St (N)										
7	L	15	6.7	0.024	6.4	LOS A	0	0.17	0.52	43.0
8	T	586	8.0	0.316	0.0	LOS A	0	0.00	0.00	50.0
9	R	13	7.7	0.029	12.3	LOS B	1	0.57	0.79	38.7
Approach		**614**	**8.0**	**0.316**	**0.4**	**LOS A**	**1**	**0.02**	**0.03**	**49.5**
Parker St										
10	L	22	9.1	0.423	38.4	LOS E	14	0.88	1.05	26.1
11	T	12	9.1	0.423	37.1	LOS E	14	0.88	1.02	26.4
12	R	27	10.7	0.424	38.4	LOS E	14	0.88	1.03	26.1
Approach		**61**	**9.8**	**0.424**	**38.2**	**LOS E**	**14**	**0.88**	**1.04**	**26.1**
All Vehicles		**1538**	**6.9**	**0.839**	**8.2**	**Not Applicable**	**46**	**0.17**	**0.25**	**41.7**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Par_Fea Intersection Option2

2029 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	32	12.9	0.052	6.4	LOS A	1	0.10	0.53	43.3
2	T	443	14.0	0.248	0.0	LOS A	0	0.00	0.00	50.0
3	R	24	12.5	0.056	12.8	LOS B	2	0.57	0.83	38.5
Approach		**498**	**13.9**	**0.248**	**1.0**	**LOS A**	**2**	**0.03**	**0.07**	**48.8**
Fearon St										
4	L	42	4.8	0.216	17.6	LOS C	7	0.70	0.90	35.1
5	T	1	50.0	0.222	16.2	LOS C	7	0.70	0.87	35.9
6	R	20	5.0	0.217	17.6	LOS C	7	0.70	0.89	35.2
Approach		**64**	**6.2**	**0.217**	**17.6**	**LOS C**	**7**	**0.70**	**0.90**	**35.2**
High St (N)										
7	L	5	16.7	0.011	6.3	LOS A	0	0.09	0.53	43.4
8	T	531	7.9	0.286	0.0	LOS A	0	0.00	0.00	50.0
9	R	19	10.5	0.038	11.3	LOS B	1	0.51	0.76	39.5
Approach		**555**	**8.1**	**0.286**	**0.5**	**LOS A**	**1**	**0.02**	**0.03**	**49.5**
Parker St										
10	L	49	6.0	0.476	25.1	LOS D	19	0.80	1.08	31.2
11	T	22	4.5	0.478	23.8	LOS C	19	0.80	1.02	31.8
12	R	52	5.9	0.477	25.1	LOS D	19	0.80	1.03	31.2
Approach		**123**	**5.7**	**0.478**	**24.8**	**LOS C**	**19**	**0.80**	**1.05**	**31.3**
All Vehicles		**1240**	**10.1**	**0.478**	**4.0**	**Not Applicable**	**19**	**0.14**	**0.19**	**45.6**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Par_Fea Intersection Option2

2019 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	58	5.3	0.085	6.3	LOS A	2	0.22	0.48	42.8
2	T	405	5.9	0.216	0.0	LOS A	0	0.00	0.00	50.0
3	R	63	6.3	0.107	10.3	LOS B	3	0.48	0.77	40.2
Approach		**525**	**5.9**	**0.216**	**1.9**	**LOS A**	**3**	**0.08**	**0.14**	**47.7**
Fearon St										
4	L	45	4.4	0.405	19.5	LOS C	16	0.73	0.99	34.1
5	T	12	8.3	0.400	18.2	LOS C	16	0.73	0.95	34.8
6	R	71	5.6	0.403	19.5	LOS C	16	0.73	0.97	34.1
Approach		**128**	**5.5**	**0.404**	**19.3**	**LOS C**	**16**	**0.73**	**0.98**	**34.2**
High St (N)										
7	L	11	9.1	0.018	6.4	LOS A	0	0.15	0.52	43.1
8	T	408	8.1	0.221	0.0	LOS A	0	0.00	0.00	50.0
9	R	8	11.1	0.016	10.2	LOS B	1	0.46	0.70	40.3
Approach		**429**	**8.2**	**0.221**	**0.4**	**LOS A**	**1**	**0.01**	**0.03**	**49.5**
Parker St										
10	L	18	11.1	0.176	17.9	LOS C	6	0.71	0.85	35.1
11	T	9	10.0	0.175	16.6	LOS C	6	0.71	0.86	35.8
12	R	22	9.1	0.177	17.9	LOS C	6	0.71	0.89	35.1
Approach		**50**	**10.0**	**0.177**	**17.7**	**LOS C**	**6**	**0.71**	**0.87**	**35.2**
All Vehicles		**1132**	**6.9**	**0.405**	**4.0**	**Not Applicable**	**16**	**0.16**	**0.23**	**45.6**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Par_Fea Intersection Option2

2019 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	24	12.5	0.040	6.4	LOS A	1	0.09	0.53	43.4
2	T	334	14.1	0.187	0.0	LOS A	0	0.00	0.00	50.0
3	R	19	15.8	0.040	11.5	LOS B	1	0.50	0.76	39.4
Approach		**377**	**14.1**	**0.187**	**1.0**	**LOS A**	**1**	**0.03**	**0.07**	**48.9**
Fearon St										
4	L	40	5.0	0.150	13.5	LOS B	5	0.59	0.79	37.8
5	T	1	50.0	0.154	12.1	LOS B	5	0.59	0.80	38.7
6	R	19	5.3	0.150	13.4	LOS B	5	0.59	0.84	37.8
Approach		**61**	**6.6**	**0.150**	**13.4**	**LOS B**	**5**	**0.59**	**0.81**	**37.9**
High St (N)										
7	L	2	33.3	0.007	6.3	LOS A	0	0.09	0.53	43.4
8	T	441	7.9	0.238	0.0	LOS A	0	0.00	0.00	50.0
9	R	14	7.1	0.024	9.5	LOS A	1	0.43	0.68	40.8
Approach		**458**	**8.1**	**0.238**	**0.3**	**LOS A**	**1**	**0.01**	**0.02**	**49.6**
Parker St										
10	L	66	6.1	0.355	16.2	LOS C	14	0.64	0.89	36.0
11	T	23	4.3	0.354	14.9	LOS B	14	0.64	0.89	36.8
12	R	48	6.1	0.355	16.2	LOS C	14	0.64	0.92	36.1
Approach		**138**	**5.8**	**0.354**	**16.0**	**LOS C**	**14**	**0.64**	**0.90**	**36.2**
All Vehicles		**1034**	**9.9**	**0.355**	**3.4**	**Not Applicable**	**14**	**0.14**	**0.20**	**46.2**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Par_Fea Intersection Option2

2029 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	62	6.5	0.094	6.3	LOS A	2	0.23	0.48	42.8
2	T	488	5.9	0.260	0.0	LOS A	0	0.00	0.00	50.0
3	R	68	5.9	0.132	11.4	LOS B	4	0.53	0.83	39.3
Approach		**618**	**6.0**	**0.260**	**1.9**	**LOS A**	**4**	**0.08**	**0.14**	**47.8**
Fearon St										
4	L	52	5.8	0.612	29.9	LOS D	27	0.85	1.18	29.1
5	T	13	7.7	0.619	28.6	LOS D	27	0.85	1.11	29.6
6	R	80	5.0	0.611	29.9	LOS D	27	0.85	1.12	29.1
Approach		**145**	**5.5**	**0.608**	**29.8**	**LOS D**	**27**	**0.85**	**1.14**	**29.1**
High St (N)										
7	L	13	7.7	0.021	6.4	LOS A	0	0.16	0.52	43.1
8	T	493	7.9	0.265	0.0	LOS A	0	0.00	0.00	50.0
9	R	11	9.1	0.022	11.2	LOS B	1	0.51	0.74	39.5
Approach		**516**	**7.9**	**0.265**	**0.4**	**LOS A**	**1**	**0.01**	**0.03**	**49.5**
Parker St										
10	L	40	10.0	0.541	31.8	LOS D	22	0.86	1.13	28.4
11	T	22	9.1	0.537	30.5	LOS D	22	0.86	1.07	28.9
12	R	49	10.0	0.543	31.7	LOS D	22	0.86	1.08	28.4
Approach		**112**	**9.8**	**0.541**	**31.5**	**LOS D**	**22**	**0.86**	**1.09**	**28.5**
All Vehicles		**1391**	**7.0**	**0.619**	**6.6**	**Not Applicable**	**27**	**0.20**	**0.28**	**43.1**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Par_Fea Intersection Option 4

2019 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	31	13.3	0.050	6.4	LOS A	1	0.10	0.52	43.3
2	T	425	14.1	0.239	0.0	LOS A	0	0.00	0.00	50.0
3	R	23	13.0	0.055	12.8	LOS B	2	0.58	0.82	38.4
Approach		**479**	**14.0**	**0.238**	**1.0**	**LOS A**	**2**	**0.03**	**0.07**	**48.8**
Fearon St										
4	L	40	5.0	0.104	13.7	LOS B	3	0.62	0.81	37.7
5	T	1	50.0	0.105	12.3	LOS B	3	0.62	0.81	38.6
6	R	19	5.3	0.098	22.7	LOS C	3	0.80	0.92	32.4
Approach		**61**	**6.6**	**0.104**	**16.4**	**LOS C**	**3**	**0.67**	**0.84**	**35.9**
High St (N)										
7	L	3	25.0	0.008	6.3	LOS A	0	0.10	0.53	43.3
8	T	539	8.0	0.291	0.0	LOS A	0	0.00	0.00	50.0
9	R	17	6.2	0.029	10.4	LOS B	1	0.49	0.73	40.1
Approach		**559**	**8.1**	**0.291**	**0.3**	**LOS A**	**1**	**0.01**	**0.02**	**49.6**
Parker St										
10	L	27	7.1	0.126	16.1	LOS C	4	0.65	0.80	36.1
11	T	14	7.1	0.125	14.8	LOS B	4	0.65	0.83	36.9
12	R	36	5.6	0.188	24.0	LOS C	5	0.82	0.94	31.8
Approach		**78**	**6.4**	**0.188**	**19.5**	**LOS C**	**5**	**0.73**	**0.87**	**34.1**
All Vehicles		**1177**	**10.3**	**0.291**	**2.7**	**Not Applicable**	**5**	**0.10**	**0.14**	**46.9**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Par_Fea Intersection Option 4

2029 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	39	13.2	0.064	6.4	LOS A	1	0.12	0.52	43.2
2	T	544	14.0	0.304	0.0	LOS A	0	0.00	0.00	50.0
3	R	31	13.3	0.092	15.6	LOS C	3	0.68	0.88	36.6
Approach		**612**	**13.9**	**0.304**	**1.2**	**LOS A**	**3**	**0.04**	**0.08**	**48.6**
Fearon St										
4	L	42	4.8	0.167	18.8	LOS C	5	0.72	0.89	34.5
5	T	1	50.0	0.167	17.3	LOS C	5	0.72	0.87	35.2
6	R	20	5.0	0.165	34.2	LOS D	4	0.88	0.96	27.4
Approach		**64**	**6.2**	**0.168**	**23.5**	**LOS C**	**5**	**0.77**	**0.91**	**31.9**
High St (N)										
7	L	4	20.0	0.009	6.3	LOS A	0	0.11	0.53	43.3
8	T	647	8.0	0.350	0.0	LOS A	0	0.00	0.00	50.0
9	R	20	10.0	0.049	12.9	LOS B	1	0.60	0.83	38.3
Approach		**673**	**8.2**	**0.350**	**0.4**	**LOS A**	**1**	**0.02**	**0.03**	**49.5**
Parker St										
10	L	34	5.9	0.227	23.0	LOS C	7	0.78	0.93	32.2
11	T	17	5.9	0.227	21.7	LOS C	7	0.78	0.91	32.8
12	R	44	6.7	0.391	42.8	LOS E	12	0.92	1.02	24.7
Approach		**96**	**6.2**	**0.390**	**32.1**	**LOS D**	**12**	**0.84**	**0.97**	**28.3**
All Vehicles		**1445**	**10.4**	**0.391**	**3.9**	**Not Applicable**	**12**	**0.12**	**0.15**	**45.7**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Par_Fea Intersection Option 4

2029 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	77	6.5	0.117	6.3	LOS A	2	0.27	0.46	42.6
2	T	600	6.0	0.320	0.0	LOS A	0	0.00	0.00	50.0
3	R	83	6.0	0.193	13.1	LOS B	6	0.63	0.86	38.1
Approach		**760**	**6.1**	**0.320**	**2.1**	**LOS A**	**6**	**0.10**	**0.14**	**47.5**
Fearon St										
4	L	52	5.8	0.243	20.2	LOS C	8	0.74	0.92	33.7
5	T	13	7.7	0.245	18.9	LOS C	8	0.74	0.89	34.4
6	R	80	5.0	0.650	52.2	LOS F	23	0.95	1.13	22.2
Approach		**145**	**5.5**	**0.652**	**37.8**	**LOS E**	**23**	**0.85**	**1.04**	**26.2**
High St (N)										
7	L	15	6.7	0.024	6.5	LOS A	0	0.18	0.52	43.0
8	T	586	8.0	0.316	0.0	LOS A	0	0.00	0.00	50.0
9	R	13	7.7	0.031	12.7	LOS B	1	0.59	0.81	38.4
Approach		**614**	**8.0**	**0.316**	**0.4**	**LOS A**	**1**	**0.02**	**0.03**	**49.5**
Parker St										
10	L	26	11.1	0.200	24.8	LOS C	6	0.81	0.93	31.4
11	T	14	7.7	0.200	23.5	LOS C	6	0.81	0.91	32.0
12	R	32	9.7	0.310	45.3	LOS E	9	0.92	1.00	24.0
Approach		**71**	**9.9**	**0.309**	**33.5**	**LOS D**	**9**	**0.85**	**0.96**	**27.7**
All Vehicles		**1590**	**6.9**	**0.650**	**6.1**	**Not Applicable**	**23**	**0.17**	**0.22**	**43.6**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Par_Fea Intersection Option 4

2019 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	61	6.6	0.093	6.3	LOS A	2	0.22	0.48	42.8
2	T	478	6.1	0.255	0.0	LOS A	0	0.00	0.00	50.0
3	R	66	6.1	0.128	11.3	LOS B	4	0.53	0.82	39.4
Approach		**605**	**6.1**	**0.255**	**1.9**	**LOS A**	**4**	**0.08**	**0.14**	**47.8**
Fearon St										
4	L	45	4.4	0.150	14.8	LOS B	5	0.63	0.81	37.0
5	T	12	8.3	0.150	13.5	LOS B	5	0.63	0.82	37.8
6	R	41	4.9	0.214	24.3	LOS C	6	0.82	0.95	31.6
Approach		**98**	**5.1**	**0.213**	**18.6**	**LOS C**	**6**	**0.71**	**0.87**	**34.6**
High St (N)										
7	L	12	8.3	0.019	6.4	LOS A	0	0.16	0.52	43.1
8	T	489	8.0	0.264	0.0	LOS A	0	0.00	0.00	50.0
9	R	11	9.1	0.022	10.9	LOS B	1	0.50	0.73	39.8
Approach		**512**	**8.0**	**0.264**	**0.4**	**LOS A**	**1**	**0.01**	**0.03**	**49.5**
Parker St										
10	L	21	9.5	0.108	17.7	LOS C	4	0.69	0.83	35.2
11	T	12	9.1	0.108	16.4	LOS C	4	0.69	0.85	36.0
12	R	26	11.1	0.172	27.8	LOS D	5	0.84	0.94	30.0
Approach		**59**	**10.2**	**0.172**	**22.1**	**LOS C**	**5**	**0.76**	**0.89**	**32.8**
All Vehicles		**1274**	**7.0**	**0.264**	**3.5**	**Not Applicable**	**6**	**0.13**	**0.18**	**46.1**

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Following Degree of Saturation
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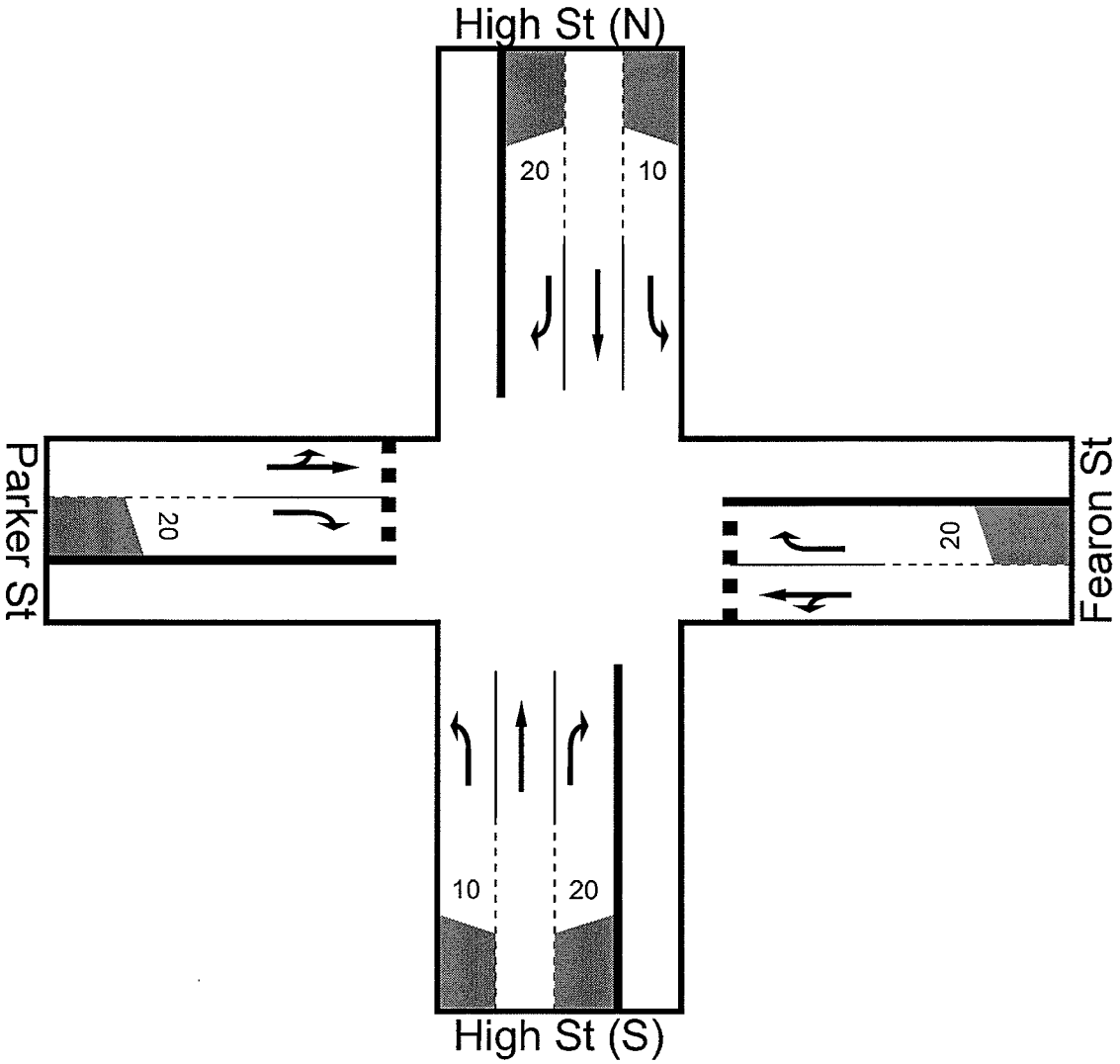
Following LOS
- Based on density for continuous movements


High St (N)
20
10
Parker St
20
20
Fearon St
10
20
High St (S)

SIDRA INTERSECTION

Movement Summary

Par_Fea Intersection

2009 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	20	15.0	0.034	6.4	LOS A	1	0.08	0.53	43.4
2	T	266	13.9	0.149	0.0	LOS A	0	0.00	0.00	50.0
3	R	18	16.7	0.036	10.3	LOS B	1	0.46	0.71	40.3
Approach		**304**	**14.1**	**0.149**	**1.0**	**LOS A**	**1**	**0.03**	**0.08**	**48.8**
Fearon St										
4	L	35	2.9	0.058	10.0	LOS B	2	0.49	0.69	40.4
5	T	1	50.0	0.057	8.6	LOS A	2	0.49	0.75	41.4
6	R	16	6.2	0.047	14.0	LOS B	1	0.62	0.85	37.5
Approach		**52**	**5.8**	**0.058**	**11.2**	**LOS B**	**2**	**0.53**	**0.74**	**39.5**
High St (N)										
7	L	4	20.0	0.009	6.2	LOS A	0	0.08	0.53	43.4
8	T	368	7.9	0.198	0.0	LOS A	0	0.00	0.00	50.0
9	R	13	7.7	0.022	8.7	LOS A	1	0.38	0.64	41.5
Approach		**386**	**8.0**	**0.198**	**0.4**	**LOS A**	**1**	**0.01**	**0.03**	**49.6**
Parker St										
10	L	21	4.8	0.054	10.9	LOS B	2	0.49	0.65	39.7
11	T	8	11.1	0.054	9.6	LOS A	2	0.49	0.75	40.7
12	R	22	4.5	0.063	14.0	LOS B	2	0.62	0.85	37.5
Approach		**52**	**5.8**	**0.063**	**12.0**	**LOS B**	**2**	**0.55**	**0.75**	**38.9**
All Vehicles		**794**	**10.1**	**0.198**	**2.1**	**Not Applicable**	**2**	**0.09**	**0.14**	**47.6**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Par_Fea Intersection

2019 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	28	14.3	0.048	6.4	LOS A	1	0.10	0.53	43.3
2	T	395	14.0	0.220	0.0	LOS A	0	0.00	0.00	50.0
3	R	22	13.6	0.054	12.9	LOS B	2	0.58	0.82	38.4
Approach		**444**	**14.0**	**0.220**	**1.0**	**LOS A**	**2**	**0.03**	**0.07**	**48.8**
Fearon St										
4	L	40	5.0	0.100	13.3	LOS B	3	0.61	0.80	38.0
5	T	1	50.0	0.100	11.9	LOS B	3	0.61	0.81	38.9
6	R	19	5.3	0.092	21.5	LOS C	3	0.79	0.92	33.0
Approach		**61**	**6.6**	**0.100**	**15.8**	**LOS C**	**3**	**0.66**	**0.84**	**36.3**
High St (N)										
7	L	3	25.0	0.008	6.3	LOS A	0	0.09	0.53	43.4
8	T	539	8.0	0.291	0.0	LOS A	0	0.00	0.00	50.0
9	R	17	6.2	0.028	10.0	LOS B	1	0.47	0.71	40.4
Approach		**559**	**8.1**	**0.291**	**0.3**	**LOS A**	**1**	**0.01**	**0.02**	**49.6**
Parker St										
10	L	25	7.7	0.111	15.4	LOS C	4	0.63	0.77	36.5
11	T	13	7.7	0.110	14.1	LOS B	4	0.63	0.82	37.4
12	R	34	5.9	0.168	22.5	LOS C	5	0.80	0.93	32.5
Approach		**73**	**6.8**	**0.168**	**18.5**	**LOS C**	**5**	**0.71**	**0.85**	**34.7**
All Vehicles		**1137**	**10.2**	**0.291**	**2.6**	**Not Applicable**	**5**	**0.10**	**0.14**	**47.1**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Par_Fea Intersection

2029 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	73	5.6	0.108	6.3	LOS A	2	0.25	0.47	42.7
2	T	567	6.0	0.302	0.0	LOS A	0	0.00	0.00	50.0
3	R	79	6.3	0.185	13.1	LOS B	6	0.63	0.86	38.1
Approach		**718**	**6.0**	**0.302**	**2.1**	**LOS A**	**6**	**0.09**	**0.14**	**47.5**
Fearon St										
4	L	52	5.8	0.229	19.1	LOS C	7	0.73	0.91	34.3
5	T	13	7.7	0.228	17.8	LOS C	7	0.73	0.88	35.1
6	R	80	5.0	0.606	46.3	LOS E	21	0.94	1.11	23.7
Approach		**145**	**5.5**	**0.606**	**34.0**	**LOS D**	**21**	**0.84**	**1.02**	**27.5**
High St (N)										
7	L	15	6.7	0.024	6.4	LOS A	0	0.17	0.52	43.0
8	T	586	8.0	0.316	0.0	LOS A	0	0.00	0.00	50.0
9	R	13	7.7	0.029	12.1	LOS B	1	0.57	0.79	38.8
Approach		**614**	**8.0**	**0.316**	**0.4**	**LOS A**	**1**	**0.02**	**0.03**	**49.5**
Parker St										
10	L	22	9.1	0.158	23.4	LOS C	5	0.79	0.92	32.1
11	T	12	9.1	0.159	22.1	LOS C	5	0.79	0.90	32.7
12	R	27	10.7	0.267	42.1	LOS E	8	0.91	0.99	24.9
Approach		**61**	**9.8**	**0.266**	**31.7**	**LOS D**	**8**	**0.84**	**0.95**	**28.4**
All Vehicles		**1538**	**6.9**	**0.606**	**5.6**	**Not Applicable**	**21**	**0.16**	**0.21**	**44.0**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Par_Fea Intersection

2009 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	34	5.9	0.051	6.2	LOS A	1	0.13	0.51	43.2
2	T	309	6.1	0.165	0.0	LOS A	0	0.00	0.00	50.0
3	R	42	7.0	0.072	9.9	LOS A	2	0.47	0.74	40.5
Approach		**387**	**6.2**	**0.165**	**1.6**	**LOS A**	**2**	**0.06**	**0.13**	**48.1**
Fearon St										
4	L	38	5.3	0.090	11.3	LOS B	3	0.54	0.73	39.4
5	T	9	10.0	0.089	10.0	LOS B	3	0.54	0.78	40.3
6	R	41	4.9	0.132	15.7	LOS C	4	0.68	0.88	36.4
Approach		**89**	**5.6**	**0.132**	**13.2**	**LOS B**	**4**	**0.61**	**0.80**	**38.0**
High St (N)										
7	L	8	11.1	0.015	6.3	LOS A	0	0.12	0.53	43.2
8	T	396	8.1	0.214	0.0	LOS A	0	0.00	0.00	50.0
9	R	9	10.0	0.018	9.0	LOS A	0	0.40	0.65	41.3
Approach		**415**	**8.2**	**0.214**	**0.4**	**LOS A**	**0**	**0.01**	**0.03**	**49.6**
Parker St										
10	L	18	11.1	0.062	12.6	LOS B	2	0.55	0.70	38.5
11	T	9	10.0	0.062	11.3	LOS B	2	0.55	0.78	39.4
12	R	27	10.7	0.103	17.3	LOS C	3	0.70	0.88	35.5
Approach		**56**	**10.7**	**0.103**	**14.7**	**LOS B**	**3**	**0.63**	**0.81**	**37.1**
All Vehicles		**947**	**7.3**	**0.214**	**2.9**	**Not Applicable**	**4**	**0.13**	**0.19**	**46.7**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Par_Fea Intersection

2019 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	58	5.3	0.085	6.3	LOS A	2	0.20	0.48	42.9
2	T	453	6.0	0.241	0.0	LOS A	0	0.00	0.00	50.0
3	R	63	6.3	0.123	11.3	LOS B	4	0.53	0.82	39.4
Approach		**572**	**5.9**	**0.241**	**1.9**	**LOS A**	**4**	**0.08**	**0.14**	**47.8**
Fearon St										
4	L	45	4.4	0.144	14.3	LOS B	5	0.62	0.81	37.3
5	T	12	8.3	0.145	13.0	LOS B	5	0.62	0.82	38.1
6	R	71	5.6	0.355	26.2	LOS D	12	0.84	1.00	30.7
Approach		**128**	**5.5**	**0.355**	**20.8**	**LOS C**	**12**	**0.75**	**0.91**	**33.4**
High St (N)										
7	L	12	8.3	0.019	6.4	LOS A	0	0.15	0.52	43.1
8	T	489	8.0	0.264	0.0	LOS A	0	0.00	0.00	50.0
9	R	11	9.1	0.021	10.5	LOS B	1	0.49	0.71	40.0
Approach		**512**	**8.0**	**0.264**	**0.4**	**LOS A**	**1**	**0.01**	**0.03**	**49.5**
Parker St										
10	L	18	11.1	0.095	17.6	LOS C	3	0.69	0.82	35.3
11	T	9	10.0	0.094	16.3	LOS C	3	0.69	0.85	36.0
12	R	22	9.1	0.125	24.8	LOS C	4	0.82	0.93	31.4
Approach		**50**	**10.0**	**0.125**	**20.5**	**LOS C**	**4**	**0.75**	**0.87**	**33.6**
All Vehicles		**1262**	**6.9**	**0.355**	**3.9**	**Not Applicable**	**12**	**0.15**	**0.20**	**45.7**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Par_Fea Intersection

2029 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	37	13.5	0.062	6.4	LOS A	1	0.12	0.52	43.3
2	T	514	14.0	0.288	0.0	LOS A	0	0.00	0.00	50.0
3	R	28	14.3	0.087	15.8	LOS C	3	0.68	0.88	36.5
Approach		**579**	**14.0**	**0.288**	**1.2**	**LOS A**	**3**	**0.04**	**0.08**	**48.6**
Fearon St										
4	L	42	4.8	0.158	18.0	LOS C	5	0.71	0.89	34.9
5	T	1	50.0	0.154	16.6	LOS C	5	0.71	0.86	35.7
6	R	20	5.0	0.154	32.1	LOS D	4	0.88	0.95	28.2
Approach		**64**	**6.2**	**0.158**	**22.3**	**LOS C**	**5**	**0.76**	**0.91**	**32.5**
High St (N)										
7	L	4	20.0	0.009	6.3	LOS A	0	0.11	0.53	43.3
8	T	647	8.0	0.350	0.0	LOS A	0	0.00	0.00	50.0
9	R	20	10.0	0.046	12.3	LOS B	1	0.57	0.81	38.7
Approach		**673**	**8.2**	**0.350**	**0.4**	**LOS A**	**1**	**0.02**	**0.03**	**49.5**
Parker St										
10	L	34	5.9	0.211	21.5	LOS C	7	0.76	0.92	33.0
11	T	17	5.9	0.213	20.2	LOS C	7	0.76	0.89	33.7
12	R	44	6.7	0.366	39.6	LOS E	11	0.91	1.01	25.6
Approach		**96**	**6.2**	**0.365**	**29.7**	**LOS D**	**11**	**0.83**	**0.96**	**29.2**
All Vehicles		**1412**	**10.3**	**0.366**	**3.7**	**Not Applicable**	**11**	**0.12**	**0.15**	**45.9**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Par_Fea Intersection Option 2

2019 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	24	12.5	0.040	6.4	LOS A	1	0.09	0.53	43.4
2	T	334	14.1	0.187	0.0	LOS A	0	0.00	0.00	50.0
3	R	19	15.8	0.040	11.4	LOS B	1	0.50	0.75	39.5
Approach		**377**	**14.1**	**0.187**	**1.0**	**LOS A**	**1**	**0.03**	**0.07**	**48.9**
Fearon St										
4	L	40	5.0	0.079	11.3	LOS B	3	0.55	0.75	39.4
5	T	1	50.0	0.080	9.9	LOS A	3	0.55	0.78	40.4
6	R	19	5.3	0.070	17.2	LOS C	2	0.71	0.89	35.4
Approach		**61**	**6.6**	**0.079**	**13.1**	**LOS B**	**3**	**0.60**	**0.79**	**38.1**
High St (N)										
7	L	2	33.3	0.007	6.3	LOS A	0	0.09	0.53	43.4
8	T	441	7.9	0.238	0.0	LOS A	0	0.00	0.00	50.0
9	R	14	7.1	0.024	9.4	LOS A	1	0.43	0.68	41.0
Approach		**458**	**8.1**	**0.238**	**0.3**	**LOS A**	**1**	**0.01**	**0.02**	**49.6**
Parker St										
10	L	66	6.1	0.172	12.0	LOS B	6	0.56	0.75	38.9
11	T	23	4.3	0.172	10.7	LOS B	6	0.56	0.79	39.9
12	R	48	6.1	0.182	18.0	LOS C	5	0.74	0.90	35.0
Approach		**138**	**5.8**	**0.182**	**13.9**	**LOS B**	**6**	**0.62**	**0.81**	**37.6**
All Vehicles		**1034**	**9.9**	**0.238**	**3.1**	**Not Applicable**	**6**	**0.14**	**0.19**	**46.5**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Par_Fea Intersection Option 2

2029 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	32	12.9	0.052	6.4	LOS A	1	0.10	0.53	43.3
2	T	443	14.0	0.248	0.0	LOS A	0	0.00	0.00	50.0
3	R	24	12.5	0.056	12.6	LOS B	2	0.57	0.82	38.6
Approach		**498**	**13.9**	**0.248**	**1.0**	**LOS A**	**2**	**0.03**	**0.07**	**48.8**
Fearon St										
4	L	42	4.8	0.109	13.7	LOS B	3	0.62	0.81	37.6
5	T	1	50.0	0.111	12.3	LOS B	3	0.62	0.82	38.5
6	R	20	5.0	0.107	23.4	LOS C	3	0.81	0.93	32.0
Approach		**64**	**6.2**	**0.109**	**16.7**	**LOS C**	**3**	**0.68**	**0.85**	**35.7**
High St (N)										
7	L	5	16.7	0.011	6.3	LOS A	0	0.09	0.53	43.4
8	T	531	7.9	0.286	0.0	LOS A	0	0.00	0.00	50.0
9	R	19	10.5	0.038	11.1	LOS B	1	0.51	0.76	39.6
Approach		**555**	**8.1**	**0.286**	**0.4**	**LOS A**	**1**	**0.02**	**0.03**	**49.5**
Parker St										
10	L	49	6.0	0.202	15.8	LOS C	7	0.66	0.84	36.3
11	T	22	4.5	0.204	14.5	LOS B	7	0.66	0.84	37.1
12	R	52	5.9	0.276	26.4	LOS D	8	0.84	0.97	30.6
Approach		**123**	**5.7**	**0.276**	**20.0**	**LOS C**	**8**	**0.73**	**0.89**	**33.8**
All Vehicles		**1240**	**10.1**	**0.286**	**3.4**	**Not Applicable**	**8**	**0.13**	**0.18**	**46.2**

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Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Par_Fea Intersection Option 2

2019 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	58	5.3	0.085	6.3	LOS A	2	0.22	0.48	42.8
2	T	405	5.9	0.216	0.0	LOS A	0	0.00	0.00	50.0
3	R	63	6.3	0.107	10.2	LOS B	3	0.48	0.77	40.3
Approach		**525**	**5.9**	**0.216**	**1.9**	**LOS A**	**3**	**0.08**	**0.14**	**47.7**
Fearon St										
4	L	45	4.4	0.120	12.5	LOS B	4	0.57	0.75	38.5
5	T	12	8.3	0.120	11.2	LOS B	4	0.57	0.79	39.5
6	R	71	5.6	0.284	20.7	LOS C	9	0.78	0.95	33.4
Approach		**128**	**5.5**	**0.284**	**16.9**	**LOS C**	**9**	**0.69**	**0.87**	**35.6**
High St (N)										
7	L	11	9.1	0.018	6.4	LOS A	0	0.15	0.52	43.1
8	T	408	8.1	0.221	0.0	LOS A	0	0.00	0.00	50.0
9	R	8	11.1	0.016	10.1	LOS B	1	0.46	0.69	40.4
Approach		**429**	**8.2**	**0.221**	**0.4**	**LOS A**	**1**	**0.01**	**0.03**	**49.5**
Parker St										
10	L	18	11.1	0.078	15.1	LOS C	3	0.63	0.78	36.8
11	T	9	10.0	0.078	13.8	LOS B	3	0.63	0.82	37.7
12	R	22	9.1	0.099	20.4	LOS C	3	0.76	0.91	33.7
Approach		**50**	**10.0**	**0.099**	**17.2**	**LOS C**	**3**	**0.69**	**0.84**	**35.5**
All Vehicles		**1132**	**6.9**	**0.284**	**3.7**	**Not Applicable**	**9**	**0.15**	**0.21**	**45.9**

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Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Par_Fea Intersection Option 2

2029 PM Peak

Give-way

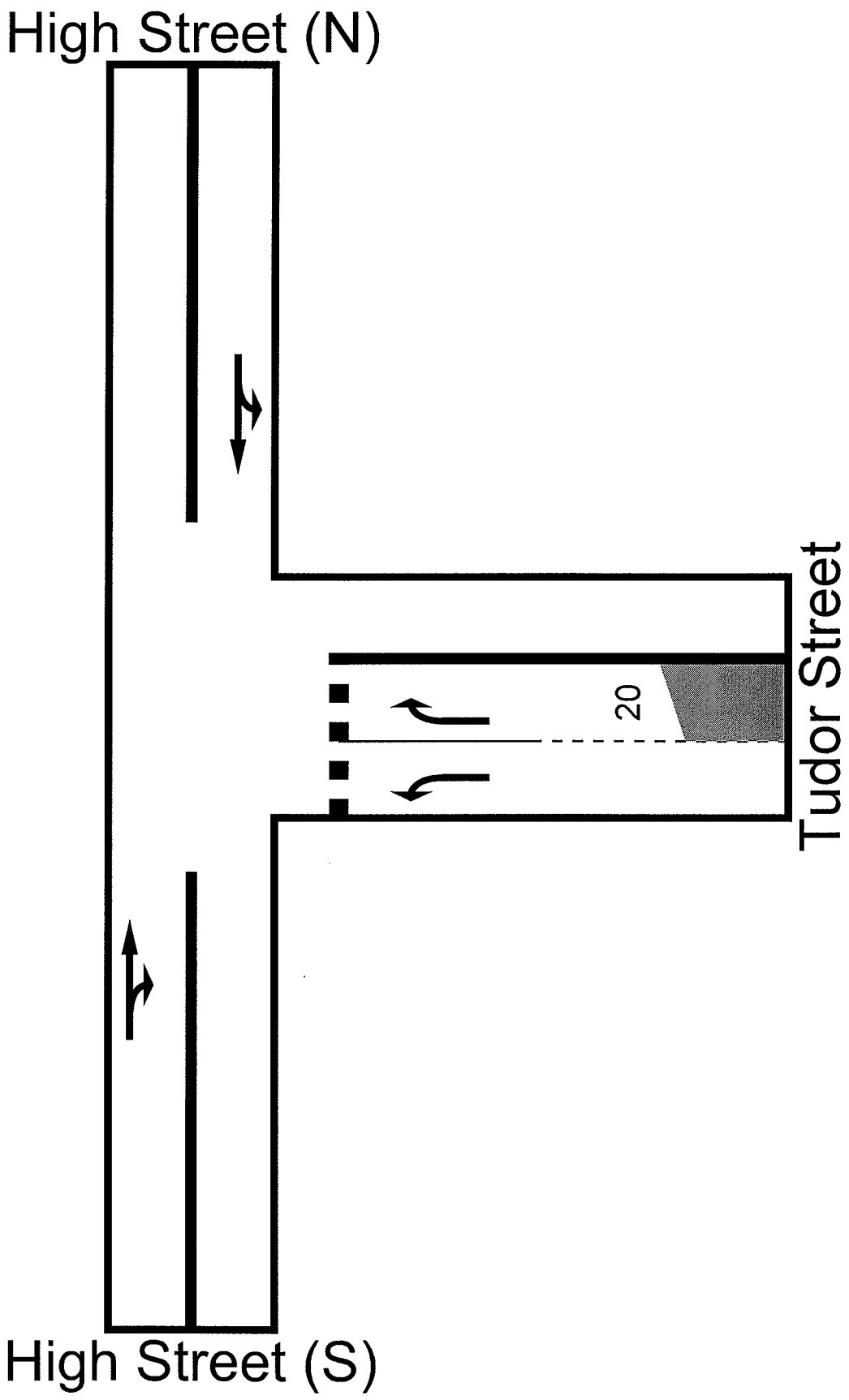
Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	62	6.5	0.094	6.3	LOS A	2	0.23	0.48	42.8
2	T	488	5.9	0.260	0.0	LOS A	0	0.00	0.00	50.0
3	R	68	5.9	0.132	11.3	LOS B	4	0.53	0.83	39.4
Approach		**618**	**6.0**	**0.260**	**1.9**	**LOS A**	**4**	**0.08**	**0.14**	**47.8**
Fearon St										
4	L	52	5.8	0.172	14.9	LOS B	6	0.64	0.84	36.9
5	T	13	7.7	0.173	13.6	LOS B	6	0.64	0.83	37.7
6	R	80	5.0	0.437	30.0	LOS D	15	0.87	1.03	29.1
Approach		**145**	**5.5**	**0.436**	**23.1**	**LOS C**	**15**	**0.77**	**0.94**	**32.2**
High St (N)										
7	L	13	7.7	0.021	6.4	LOS A	0	0.16	0.52	43.1
8	T	493	7.9	0.265	0.0	LOS A	0	0.00	0.00	50.0
9	R	11	9.1	0.022	11.0	LOS B	1	0.51	0.73	39.7
Approach		**516**	**7.9**	**0.265**	**0.4**	**LOS A**	**1**	**0.01**	**0.03**	**49.5**
Parker St										
10	L	40	10.0	0.222	19.6	LOS C	8	0.74	0.91	34.1
11	T	22	9.1	0.222	18.3	LOS C	8	0.74	0.89	34.8
12	R	49	10.0	0.318	31.2	LOS D	10	0.87	0.99	28.6
Approach		**112**	**9.8**	**0.318**	**24.5**	**LOS C**	**10**	**0.80**	**0.94**	**31.5**
All Vehicles		**1391**	**7.0**	**0.437**	**5.4**	**Not Applicable**	**15**	**0.19**	**0.25**	**44.3**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements


High Street (N)
Tudor Street
20
High Street (S)

SIDRA INTERSECTION

Movement Summary

Tud St Intersection DM

2009 AM Peak 08:30-09:30

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
2	T	476	6.9	0.367	3.9	LOS A	39	0.69	0.00	44.3
3	R	98	7.1	0.367	10.6	LOS B	39	0.69	0.90	40.0
Approach		**573**	**7.0**	**0.367**	**5.1**	**LOS A**	**39**	**0.69**	**0.15**	**43.5**
Tudor Street										
4	L	131	3.8	0.148	8.9	LOS A	5	0.50	0.74	41.3
6	R	29	3.4	0.146	24.2	LOS C	4	0.83	0.94	31.6
Approach		**160**	**3.8**	**0.148**	**11.7**	**LOS B**	**5**	**0.56**	**0.77**	**39.1**
High Street (N)										
7	L	31	9.4	0.250	7.2	LOS A	17	0.28	0.58	42.3
8	T	417	7.9	0.250	0.5	LOS A	17	0.28	0.00	47.5
Approach		**449**	**8.0**	**0.250**	**1.0**	**LOS A**	**17**	**0.28**	**0.04**	**47.1**
All Vehicles		**1182**	**6.9**	**0.367**	**4.4**	**Not Applicable**	**39**	**0.52**	**0.19**	**44.1**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

SIDRA SOLUTIONS

Site: 09_TudSt_AM Peak DM
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SIDRA INTERSECTION

Movement Summary

Tud St Intersection DM

2019 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
2	T	700	7.0	0.592	11.6	LOS B	96	1.00	0.00	39.0
3	R	144	6.9	0.593	18.3	LOS C	96	1.00	1.28	34.8
Approach		**844**	**7.0**	**0.592**	**12.8**	**LOS B**	**96**	**1.00**	**0.22**	**38.2**
Tudor Street										
4	L	182	3.8	0.275	11.3	LOS B	11	0.62	0.88	39.4
6	R	40	5.0	0.656	105.7	LOS F	20	0.98	1.10	14.1
Approach		**222**	**4.1**	**0.652**	**28.3**	**LOS D**	**20**	**0.68**	**0.92**	**29.8**
High Street (N)										
7	L	45	8.7	0.362	7.6	LOS A	28	0.40	0.61	41.9
8	T	601	8.0	0.362	1.0	LOS A	28	0.40	0.00	46.5
Approach		**647**	**8.0**	**0.363**	**1.5**	**LOS A**	**28**	**0.40**	**0.04**	**46.2**
All Vehicles		**1713**	**7.0**	**0.656**	**10.5**	**Not Applicable**	**96**	**0.73**	**0.24**	**39.3**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

SIDRA SOLUTIONS

Site: 19_TudSt_AM Peak DM
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SIDRA INTERSECTION

Movement Summary

Tud St Intersection DM

2029 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
2	T	896	7.0	0.837	40.7	LOS E	178	1.00	0.00	25.2
3	R	184	7.1	0.836	47.4	LOS E	178	1.00	1.78	23.4
Approach		**1080**	**7.0**	**0.837**	**41.9**	**LOS E**	**178**	**1.00**	**0.30**	**24.8**
Tudor Street										
4	L	207	3.9	0.405	14.8	LOS B	17	0.75	0.99	36.9
6	R	46	4.3	1.000#	446.5	LOS F	53	1.00	1.59	4.2
Approach		**253**	**4.0**	**1.000**	**93.3**	**LOS F**	**53**	**0.80**	**1.10**	**15.4**
High Street (N)										
7	L	56	7.3	0.447	8.1	LOS A	40	0.51	0.65	41.5
8	T	741	8.0	0.447	1.5	LOS A	40	0.51	0.00	45.7
Approach		**796**	**7.9**	**0.447**	**1.9**	**LOS A**	**40**	**0.51**	**0.04**	**45.4**
All Vehicles		**2129**	**7.0**	**1.000**	**33.0**	**Not Applicable**	**178**	**0.79**	**0.30**	**27.5**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

SIDRA SOLUTIONS

Site: 29_TudSt_AM Peak DM
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SIDRA INTERSECTION

Movement Summary

Tud St Intersection DM

2009 PM Peak 16:15-17:15

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
2	T	555	4.0	0.436	5.2	LOS A	54	0.79	0.00	43.6
3	R	122	4.1	0.436	11.8	LOS B	54	0.79	1.02	39.0
Approach		**677**	**4.0**	**0.436**	**6.4**	**LOS A**	**54**	**0.79**	**0.18**	**42.7**
Tudor Street										
4	L	185	3.2	0.226	9.4	LOS A	8	0.55	0.79	40.8
6	R	36	2.8	0.252	34.1	LOS D	7	0.89	0.99	27.4
Approach		**222**	**3.2**	**0.251**	**13.4**	**LOS B**	**8**	**0.60**	**0.82**	**37.8**
High Street (N)										
7	L	43	4.7	0.285	7.2	LOS A	19	0.32	0.59	42.2
8	T	476	5.0	0.286	0.7	LOS A	19	0.32	0.00	47.2
Approach		**519**	**5.0**	**0.286**	**1.2**	**LOS A**	**19**	**0.32**	**0.05**	**46.8**
All Vehicles		**1418**	**4.2**	**0.436**	**5.6**	**Not Applicable**	**54**	**0.59**	**0.23**	**43.2**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

SIDRA SOLUTIONS

Site: 09_TudSt_PM Peak DM
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SIDRA INTERSECTION

Movement Summary

Tud St Intersection DM

2019 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
2	T	875	4.0	0.747	18.5	LOS C	136	1.00	0.00	34.5
3	R	196	4.1	0.745	25.1	LOS D	136	1.00	1.49	31.2
Approach		**1071**	**4.0**	**0.747**	**19.8**	**LOS C**	**136**	**1.00**	**0.27**	**33.8**
Tudor Street										
4	L	225	3.1	0.345	11.9	LOS B	15	0.65	0.92	38.9
6	R	48	2.1	1.000#	307.6	LOS F	48	1.00	1.46	5.9
Approach		**274**	**2.9**	**1.000**	**63.7**	**LOS F**	**48**	**0.71**	**1.02**	**19.7**
High Street (N)										
7	L	58	5.2	0.377	7.9	LOS A	30	0.46	0.64	41.7
8	T	620	5.0	0.377	1.3	LOS A	30	0.46	0.00	46.0
Approach		**678**	**5.0**	**0.377**	**1.9**	**LOS A**	**30**	**0.46**	**0.05**	**45.6**
All Vehicles		**2023**	**4.2**	**1.000**	**19.7**	**Not Applicable**	**136**	**0.78**	**0.30**	**33.5**

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Following Degree of Saturation
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Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

SIDRA SOLUTIONS

Site: 19_TudSt_PM Peak DM
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SIDRA INTERSECTION

Movement Summary

Tud St Intersection DM

2029 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
2	T	1092	4.0	1.021	43.0	LOS E	487	1.00	0.00	24.5
3	R	244	4.1	1.021	49.5	LOS E	487	1.00	3.20	22.8
Approach		**1336**	**4.0**	**1.020**	**44.2**	**LOS E**	**487**	**1.00**	**0.58**	**24.2**
Tudor Street										
4	L	275	2.9	0.534	16.3	LOS C	26	0.79	1.08	36.0
6	R	58	3.4	1.000#	715.7	LOS F	60	1.00	1.82	2.7
Approach		**332**	**3.0**	**1.000**	**138.4**	**LOS F**	**60**	**0.83**	**1.21**	**11.5**
High Street (N)										
7	L	71	5.6	0.461	8.8	LOS A	49	0.59	0.73	41.2
8	T	751	5.1	0.461	2.2	LOS A	49	0.59	0.00	45.0
Approach		**822**	**5.1**	**0.461**	**2.8**	**LOS A**	**49**	**0.59**	**0.06**	**44.7**
All Vehicles		**2490**	**4.3**	**1.021**	**43.1**	**Not Applicable**	**487**	**0.84**	**0.50**	**24.3**

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- Based on density for continuous movements

Following Queue
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SIDRA SOLUTIONS

Site: 29_TudSt_PM Peak DM
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SIDRA INTERSECTION

Movement Summary

Tud St Intersection Option 2

2019 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
2	T	563	6.9	0.506	8.7	LOS A	75	1.00	0.00	41.3
3	R	141	7.1	0.505	15.4	LOS C	75	1.00	1.19	36.6
Approach		**704**	**7.0**	**0.506**	**10.0**	**LOS B**	**75**	**1.00**	**0.24**	**40.3**
Tudor Street										
4	L	182	3.8	0.265	10.9	LOS B	10	0.61	0.87	39.7
6	R	40	5.0	0.417	55.0	LOS F	13	0.94	1.04	21.5
Approach		**222**	**4.1**	**0.417**	**18.9**	**LOS C**	**13**	**0.67**	**0.90**	**34.4**
High Street (N)										
7	L	51	8.0	0.352	7.6	LOS A	27	0.38	0.61	41.9
8	T	576	8.0	0.352	0.9	LOS A	27	0.38	0.00	46.7
Approach		**626**	**8.0**	**0.352**	**1.5**	**LOS A**	**27**	**0.38**	**0.05**	**46.2**
All Vehicles		**1552**	**7.0**	**0.506**	**7.8**	**Not Applicable**	**75**	**0.70**	**0.26**	**41.4**

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- Based on density for continuous movements

Following Queue
- Density for continuous movement

SIDRA SOLUTIONS

Site: 19_TudSt_AM Peak Option 2
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SIDRA INTERSECTION

Movement Summary

Tud St Intersection Option 2

2029 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
2	T	798	7.0	0.730	19.7	LOS C	129	1.00	0.00	33.9
3	R	187	7.0	0.730	26.4	LOS D	129	1.00	1.47	30.6
Approach		**985**	**7.0**	**0.730**	**20.9**	**LOS C**	**129**	**1.00**	**0.28**	**33.2**
Tudor Street										
4	L	216	4.2	0.353	12.6	LOS B	15	0.68	0.94	38.4
6	R	47	4.3	1.000#	294.0	LOS F	48	1.00	1.44	6.2
Approach		**263**	**4.2**	**1.000**	**62.9**	**LOS F**	**48**	**0.73**	**1.03**	**19.9**
High Street (N)										
7	L	56	7.3	0.393	8.0	LOS A	32	0.47	0.64	41.6
8	T	643	7.9	0.394	1.4	LOS A	32	0.47	0.00	45.9
Approach		**698**	**7.9**	**0.394**	**1.9**	**LOS A**	**32**	**0.47**	**0.05**	**45.6**
All Vehicles		**1946**	**6.9**	**1.000**	**19.8**	**Not Applicable**	**129**	**0.78**	**0.30**	**33.4**

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- Based on density for continuous movements

Following Queue
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SIDRA SOLUTIONS

Site: 29_TudSt_AM Peak Option 2
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SIDRA INTERSECTION

Movement Summary

Tud St Intersection Option 2

2019 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
2	T	792	4.0	0.668	11.1	LOS B	115	1.00	0.00	39.4
3	R	199	4.0	0.668	17.7	LOS C	115	1.00	1.33	35.1
Approach		**991**	**4.0**	**0.668**	**12.4**	**LOS B**	**115**	**1.00**	**0.27**	**38.5**
Tudor Street										
4	L	225	3.1	0.297	10.4	LOS B	12	0.59	0.87	40.0
6	R	48	2.1	0.873	167.1	LOS F	32	0.99	1.23	9.9
Approach		**274**	**2.9**	**0.869**	**37.9**	**LOS E**	**32**	**0.66**	**0.94**	**26.2**
High Street (N)										
7	L	58	5.2	0.326	7.8	LOS A	24	0.44	0.64	41.7
8	T	524	5.0	0.327	1.2	LOS A	24	0.44	0.00	46.2
Approach		**582**	**5.0**	**0.327**	**1.9**	**LOS A**	**24**	**0.44**	**0.06**	**45.7**
All Vehicles		**1847**	**4.2**	**0.873**	**12.9**	**Not Applicable**	**115**	**0.77**	**0.30**	**37.7**

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SIDRA SOLUTIONS

Site: 19_TudSt_PM Peak Option 2
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SIDRA INTERSECTION

Movement Summary

Tud St Intersection Option 2

2029 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
2	T	895	4.0	0.856	38.4	LOS E	179	1.00	0.00	25.9
3	R	223	4.0	0.854	45.0	LOS E	179	1.00	1.83	24.0
Approach		**1118**	**4.0**	**0.856**	**39.7**	**LOS E**	**179**	**1.00**	**0.36**	**25.5**
Tudor Street										
4	L	275	2.9	0.502	15.2	LOS C	24	0.77	1.05	36.7
6	R	58	3.4	1.000#	412.8	LOS F	60	1.00	1.74	4.6
Approach		**332**	**3.0**	**1.000**	**84.6**	**LOS F**	**60**	**0.81**	**1.17**	**16.5**
High Street (N)										
7	L	67	4.5	0.441	8.3	LOS A	39	0.54	0.68	41.4
8	T	720	5.0	0.439	1.7	LOS A	39	0.54	0.00	45.4
Approach		**787**	**5.0**	**0.439**	**2.3**	**LOS A**	**39**	**0.54**	**0.06**	**45.0**
All Vehicles		**2237**	**4.2**	**1.000**	**33.2**	**Not Applicable**	**179**	**0.81**	**0.38**	**27.4**

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Following Queue
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SIDRA SOLUTIONS

Site: 29_TudSt_PM Peak Option 2
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SIDRA INTERSECTION

Movement Summary

Tud St Intersection Option

2019 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
2	T	560	7.0	0.300	0.0	LOS A	0	0.00	0.00	50.0
3	R	144	6.9	0.176	9.5	LOS A	7	0.53	0.77	40.8
Approach		**704**	**7.0**	**0.300**	**1.9**	**LOS A**	**7**	**0.11**	**0.16**	**47.8**
Tudor Street										
4	L	182	3.8	0.213	9.3	LOS A	8	0.53	0.77	41.0
6	R	40	5.0	0.248	30.9	LOS D	8	0.88	0.98	28.7
Approach		**222**	**4.1**	**0.248**	**13.2**	**LOS B**	**8**	**0.60**	**0.81**	**38.0**
High Street (N)										
7	L	46	8.5	0.079	7.2	LOS A	1	0.26	0.58	42.4
8	T	467	7.9	0.252	0.0	LOS A	0	0.00	0.00	50.0
Approach		**514**	**8.0**	**0.252**	**0.7**	**LOS A**	**1**	**0.02**	**0.05**	**49.2**
All Vehicles		**1440**	**6.9**	**0.300**	**3.2**	**Not Applicable**	**8**	**0.15**	**0.22**	**46.4**

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SIDRA SOLUTIONS

Site: 19_TudSt_AM Peak Option
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SIDRA INTERSECTION

Movement Summary

Tud St Intersection Option

2029 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
2	T	709	7.0	0.381	0.0	LOS A	0	0.00	0.00	50.0
3	R	184	7.1	0.273	11.2	LOS B	11	0.61	0.88	39.5
Approach		**894**	**7.0**	**0.381**	**2.3**	**LOS A**	**11**	**0.13**	**0.18**	**47.4**
Tudor Street										
4	L	207	3.9	0.284	10.7	LOS B	12	0.61	0.87	39.8
6	R	46	4.3	0.541	69.0	LOS F	17	0.96	1.07	18.8
Approach		**253**	**4.0**	**0.539**	**21.3**	**LOS C**	**17**	**0.67**	**0.91**	**33.1**
High Street (N)										
7	L	56	7.3	0.092	7.4	LOS A	2	0.30	0.59	42.2
8	T	592	8.0	0.319	0.0	LOS A	0	0.00	0.00	50.0
Approach		**646**	**7.9**	**0.319**	**0.6**	**LOS A**	**2**	**0.03**	**0.05**	**49.2**
All Vehicles		**1793**	**6.9**	**0.541**	**4.4**	**Not Applicable**	**17**	**0.17**	**0.24**	**45.2**

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Following LOS
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Following Queue
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SIDRA SOLUTIONS

Site: 29_TudSt_AM Peak Option
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SIDRA INTERSECTION

Movement Summary

Tud St Intersection Option

2019 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
2	T	724	4.0	0.381	0.0	LOS A	0	0.00	0.00	50.0
3	R	196	4.1	0.232	9.4	LOS A	9	0.54	0.79	40.8
Approach		**920**	**4.0**	**0.381**	**2.0**	**LOS A**	**9**	**0.11**	**0.17**	**47.7**
Tudor Street										
4	L	225	3.1	0.265	9.4	LOS A	11	0.55	0.79	40.8
6	R	48	2.1	0.436	50.2	LOS F	14	0.94	1.04	22.6
Approach		**274**	**2.9**	**0.438**	**16.6**	**LOS C**	**14**	**0.62**	**0.83**	**35.8**
High Street (N)										
7	L	59	5.1	0.096	7.3	LOS A	2	0.30	0.59	42.2
8	T	478	5.0	0.253	0.0	LOS A	0	0.00	0.00	50.0
Approach		**537**	**5.0**	**0.253**	**0.8**	**LOS A**	**2**	**0.03**	**0.07**	**49.0**
All Vehicles		**1731**	**4.2**	**0.436**	**3.9**	**Not Applicable**	**14**	**0.17**	**0.24**	**45.7**

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SIDRA SOLUTIONS

Site: 19_TudSt_PM Peak Option
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SIDRA INTERSECTION

Movement Summary

Tud St Intersection Option

2029 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
2	T	898	4.0	0.473	0.0	LOS A	0	0.00	0.00	50.0
3	R	246	4.1	0.347	11.4	LOS B	15	0.63	0.92	39.3
Approach		**1144**	**4.0**	**0.473**	**2.5**	**LOS A**	**15**	**0.13**	**0.20**	**47.2**
Tudor Street										
4	L	275	2.9	0.375	11.4	LOS B	18	0.63	0.93	39.3
6	R	58	3.4	1.000#	231.3	LOS F	52	1.00	1.47	7.6
Approach		**332**	**3.0**	**1.000**	**49.8**	**LOS E**	**52**	**0.70**	**1.02**	**22.7**
High Street (N)										
7	L	72	5.6	0.121	7.6	LOS A	2	0.35	0.62	42.1
8	T	599	5.0	0.317	0.0	LOS A	0	0.00	0.00	50.0
Approach		**671**	**5.1**	**0.317**	**0.8**	**LOS A**	**2**	**0.04**	**0.07**	**49.0**
All Vehicles		**2147**	**4.2**	**1.000**	**9.3**	**Not Applicable**	**52**	**0.19**	**0.28**	**40.9**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

SIDRA SOLUTIONS

Site: 29_TudSt_PM Peak Option
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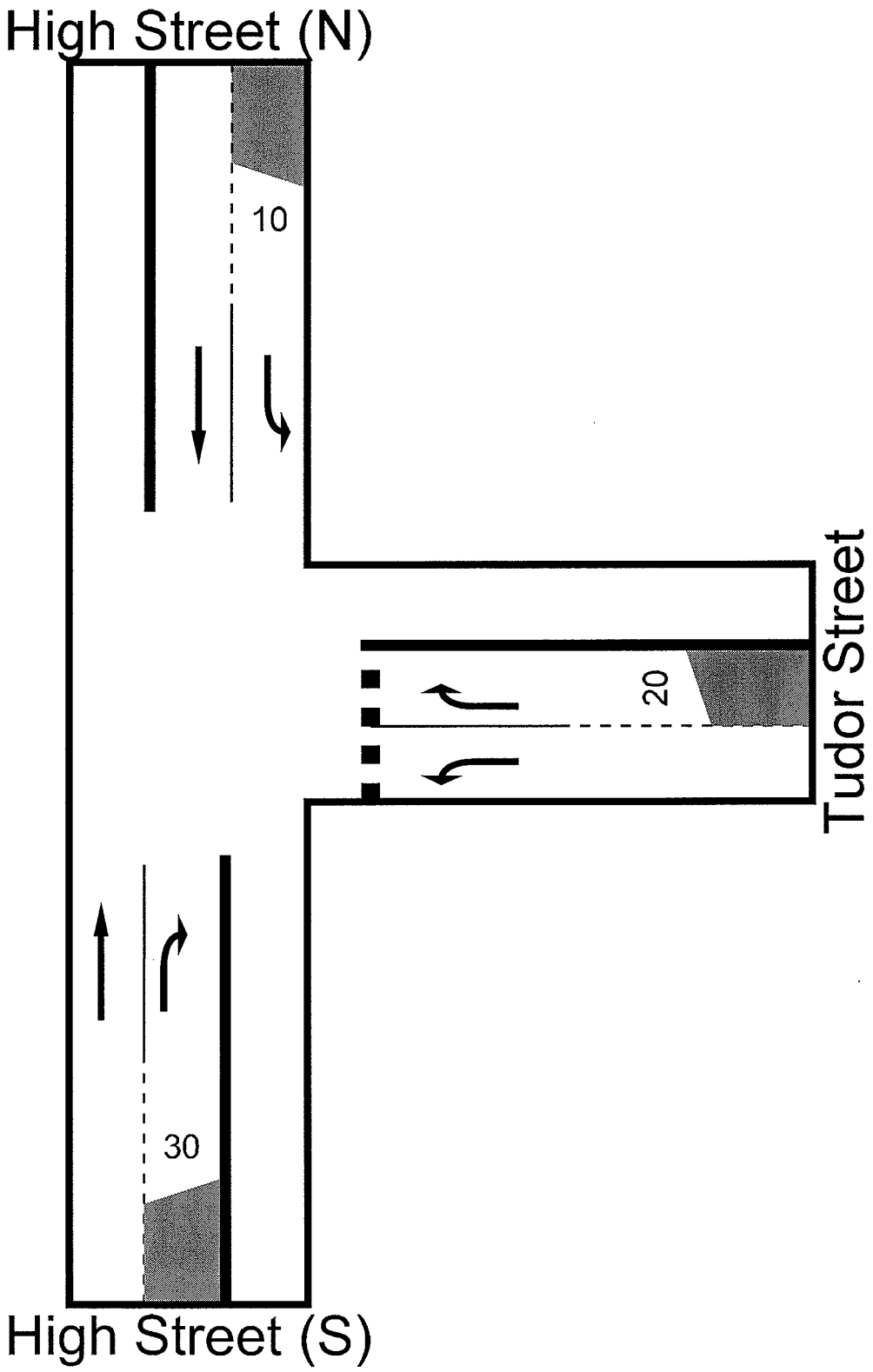
High Street (N)
10
Tudor Street
20
30
High Street (S)

SIDRA INTERSECTION

Movement Summary

Tud St Intersection Option

2009 AM Peak 08:30-09:30

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
2	T	476	6.9	0.255	0.0	LOS A	0	0.00	0.00	50.0
3	R	98	7.1	0.112	9.0	LOS A	4	0.48	0.72	41.3
Approach		**573**	**7.0**	**0.255**	**1.5**	**LOS A**	**4**	**0.08**	**0.12**	**48.2**
Tudor Street										
4	L	131	3.8	0.143	8.7	LOS A	5	0.48	0.72	41.4
6	R	29	3.4	0.126	21.3	LOS C	4	0.80	0.92	33.1
Approach		**160**	**3.8**	**0.143**	**11.0**	**LOS B**	**5**	**0.54**	**0.75**	**39.6**
High Street (N)										
7	L	31	9.4	0.053	7.0	LOS A	1	0.20	0.57	42.6
8	T	417	7.9	0.225	0.0	LOS A	0	0.00	0.00	50.0
Approach		**449**	**8.0**	**0.225**	**0.5**	**LOS A**	**1**	**0.01**	**0.04**	**49.4**
All Vehicles		**1182**	**6.9**	**0.255**	**2.4**	**Not Applicable**	**5**	**0.12**	**0.18**	**47.3**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

SIDRA SOLUTIONS

Site: 09_TudSt_AM Peak Option
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SIDRA INTERSECTION

Movement Summary

Tud St Intersection Option

2019 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
2	T	700	7.0	0.375	0.0	LOS A	0	0.00	0.00	50.0
3	R	144	6.9	0.217	10.9	LOS B	8	0.60	0.85	39.7
Approach		**844**	**7.0**	**0.375**	**1.9**	**LOS A**	**8**	**0.10**	**0.14**	**47.9**
Tudor Street										
4	L	182	3.8	0.251	10.5	LOS B	10	0.60	0.85	40.0
6	R	40	5.0	0.430	57.5	LOS F	13	0.95	1.04	21.0
Approach		**222**	**4.1**	**0.430**	**19.0**	**LOS C**	**13**	**0.66**	**0.89**	**34.4**
High Street (N)										
7	L	45	8.7	0.077	7.2	LOS A	1	0.26	0.58	42.4
8	T	601	8.0	0.324	0.0	LOS A	0	0.00	0.00	50.0
Approach		**647**	**8.0**	**0.324**	**0.5**	**LOS A**	**1**	**0.02**	**0.04**	**49.4**
All Vehicles		**1713**	**7.0**	**0.430**	**3.6**	**Not Applicable**	**13**	**0.14**	**0.20**	**46.0**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

SIDRA SOLUTIONS

Site: 19_TudSt_AM Peak Option
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SIDRA INTERSECTION

Movement Summary

Tud St Intersection Option

2029 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
2	T	896	7.0	0.480	0.0	LOS A	0	0.00	0.00	50.0
3	R	184	7.1	0.357	14.3	LOS B	15	0.73	0.97	37.3
Approach		**1080**	**7.0**	**0.480**	**2.4**	**LOS A**	**15**	**0.12**	**0.16**	**47.3**
Tudor Street										
4	L	207	3.9	0.347	12.9	LOS B	15	0.68	0.94	38.2
6	R	46	4.3	1.000#	275.3	LOS F	47	1.00	1.40	6.5
Approach		**253**	**4.0**	**1.000**	**60.6**	**LOS F**	**47**	**0.74**	**1.02**	**20.3**
High Street (N)										
7	L	56	7.3	0.092	7.4	LOS A	2	0.30	0.59	42.2
8	T	741	8.0	0.400	0.0	LOS A	0	0.00	0.00	50.0
Approach		**796**	**7.9**	**0.400**	**0.5**	**LOS A**	**2**	**0.02**	**0.04**	**49.4**
All Vehicles		**2129**	**7.0**	**1.000**	**8.6**	**Not Applicable**	**47**	**0.16**	**0.22**	**41.4**

Symbols which may appear in this table:

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Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

SIDRA SOLUTIONS

Site: 29_TudSt_AM Peak Option
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SIDRA INTERSECTION

Movement Summary

Tud St Intersection Option

2009 PM Peak 16:15-17:15

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
2	T	555	4.0	0.292	0.0	LOS A	0	0.00	0.00	50.0
3	R	122	4.1	0.144	9.2	LOS A	5	0.51	0.75	41.0
Approach		**677**	**4.0**	**0.292**	**1.7**	**LOS A**	**5**	**0.09**	**0.14**	**48.1**
Tudor Street										
4	L	185	3.2	0.216	9.2	LOS A	8	0.53	0.77	41.0
6	R	36	2.8	0.202	27.5	LOS D	6	0.86	0.96	30.1
Approach		**222**	**3.2**	**0.216**	**12.2**	**LOS B**	**8**	**0.58**	**0.80**	**38.7**
High Street (N)										
7	L	43	4.7	0.067	7.0	LOS A	1	0.23	0.57	42.5
8	T	476	5.0	0.252	0.0	LOS A	0	0.00	0.00	50.0
Approach		**519**	**5.0**	**0.252**	**0.6**	**LOS A**	**1**	**0.02**	**0.05**	**49.3**
All Vehicles		**1418**	**4.2**	**0.292**	**2.9**	**Not Applicable**	**8**	**0.14**	**0.21**	**46.7**

Symbols which may appear in this table:

Following Degree of Saturation
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Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

SIDRA SOLUTIONS

Site: 09_TudSt_PM Peak Option
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SIDRA INTERSECTION

Movement Summary

Tud St Intersection Option

2019 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
2	T	875	4.0	0.460	0.0	LOS A	0	0.00	0.00	50.0
3	R	196	4.1	0.286	11.2	LOS B	11	0.61	0.89	39.4
Approach		**1071**	**4.0**	**0.460**	**2.1**	**LOS A**	**11**	**0.11**	**0.16**	**47.7**
Tudor Street										
4	L	225	3.1	0.315	11.1	LOS B	14	0.62	0.89	39.5
6	R	48	2.1	0.814	142.2	LOS F	28	0.99	1.19	11.3
Approach		**274**	**2.9**	**0.811**	**34.0**	**LOS D**	**28**	**0.68**	**0.95**	**27.5**
High Street (N)										
7	L	58	5.2	0.095	7.3	LOS A	2	0.30	0.59	42.2
8	T	620	5.0	0.328	0.0	LOS A	0	0.00	0.00	50.0
Approach		**678**	**5.0**	**0.328**	**0.6**	**LOS A**	**2**	**0.03**	**0.05**	**49.2**
All Vehicles		**2023**	**4.2**	**0.814**	**5.9**	**Not Applicable**	**28**	**0.16**	**0.23**	**43.8**

Symbols which may appear in this table:

Following Degree of Saturation
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* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

SIDRA SOLUTIONS

Site: 19_TudSt_PM Peak Option
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SIDRA INTERSECTION

Movement Summary

Tud St Intersection Option

2029 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
2	T	1092	4.0	0.575	0.0	LOS A	0	0.00	0.00	50.0
3	R	244	4.1	0.445	14.6	LOS B	20	0.75	1.01	37.1
Approach		**1336**	**4.0**	**0.575**	**2.7**	**LOS A**	**20**	**0.14**	**0.19**	**47.0**
Tudor Street										
4	L	275	2.9	0.457	14.0	LOS B	23	0.72	1.01	37.5
6	R	58	3.4	1.000#	378.1	LOS F	59	1.00	1.70	4.9
Approach		**332**	**3.0**	**1.000**	**77.6**	**LOS F**	**59**	**0.77**	**1.13**	**17.4**
High Street (N)										
7	L	71	5.6	0.120	7.6	LOS A	2	0.34	0.61	42.1
8	T	751	5.1	0.398	0.0	LOS A	0	0.00	0.00	50.0
Approach		**822**	**5.1**	**0.398**	**0.7**	**LOS A**	**2**	**0.03**	**0.05**	**49.2**
All Vehicles		**2490**	**4.3**	**1.000**	**12.0**	**Not Applicable**	**59**	**0.19**	**0.27**	**38.8**

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x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

SIDRA SOLUTIONS

Site: 29_TudSt_PM Peak Option
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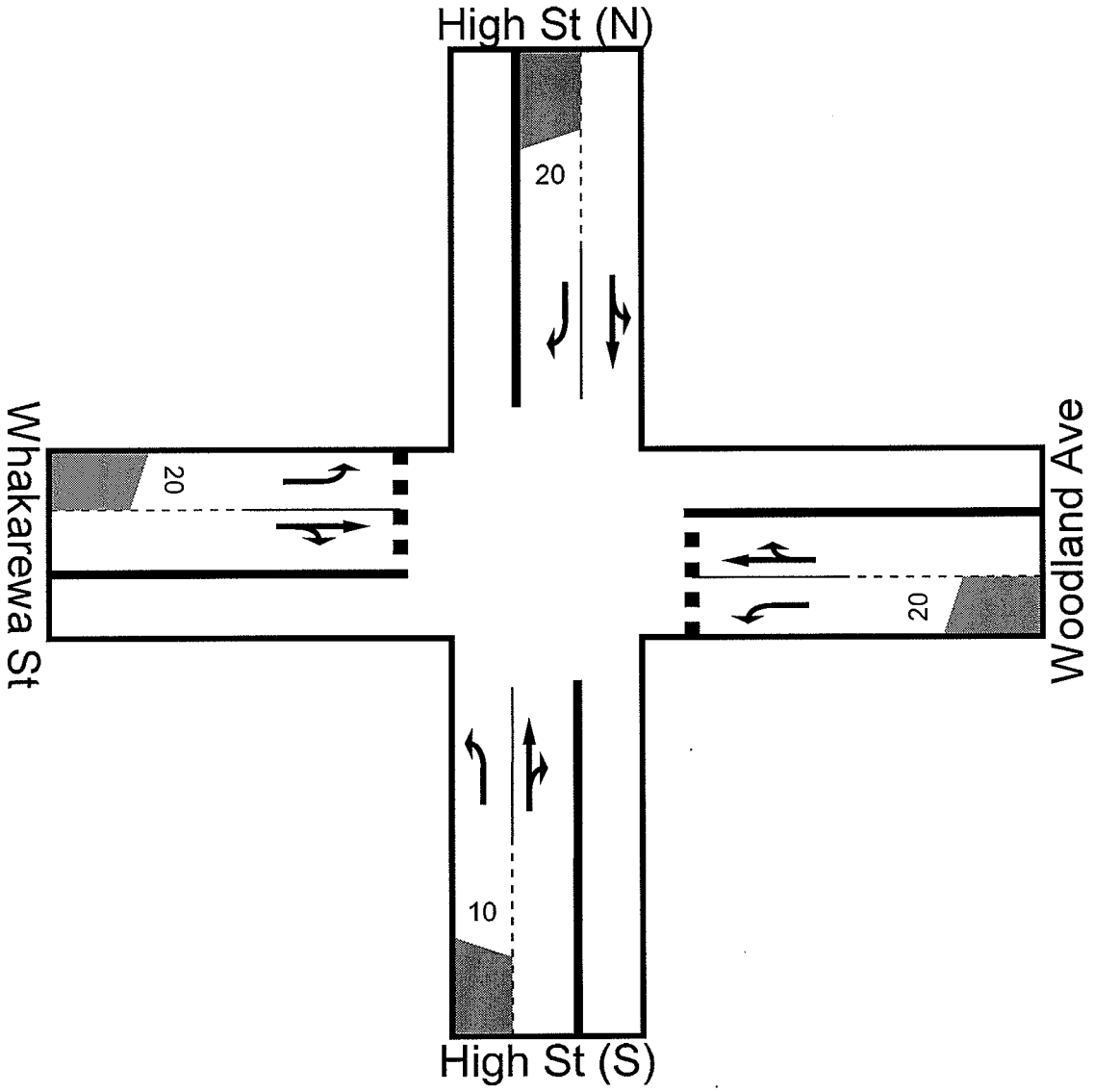

High St (N)
20
Whakarewa St
20
Woodland Ave
20
10
High St (S)

SIDRA INTERSECTION

Movement Summary

Wha St_WoodAve Intersection DM

2009 AM Peak 08:30-09:30

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	81	6.2	0.129	7.1	LOS A	2	0.24	0.58	42.5
2	T	431	6.0	0.258	5.8	LOS A	34	0.79	0.00	43.5
3	R	15	6.7	0.259	12.5	LOS B	34	0.79	0.92	38.6
Approach		**527**	**6.1**	**0.258**	**6.2**	**LOS A**	**34**	**0.71**	**0.12**	**43.2**
Woodland Ave										
4	L	12	7.7	0.020	9.6	LOS A	1	0.49	0.69	40.7
5	T	8	12.5	0.110	28.6	LOS D	4	0.85	0.93	29.6
6	R	9	11.1	0.110	30.0	LOS D	4	0.85	0.94	29.0
Approach		**30**	**10.0**	**0.110**	**20.8**	**LOS C**	**4**	**0.70**	**0.83**	**33.3**
High St (N)										
7	L	15	6.7	0.234	6.6	LOS A	14	0.09	0.58	43.0
8	T	426	4.9	0.236	0.1	LOS A	14	0.09	0.00	49.2
9	R	125	4.8	0.230	11.4	LOS B	8	0.57	0.83	39.3
Approach		**566**	**4.9**	**0.236**	**2.7**	**LOS A**	**14**	**0.19**	**0.20**	**46.4**
Whakarewa St										
10	L	131	3.8	0.200	9.6	LOS A	6	0.51	0.77	40.7
11	T	3	33.3	0.429	33.1	LOS D	17	0.89	1.03	27.8
12	R	75	4.0	0.436	34.6	LOS D	17	0.89	1.05	27.3
Approach		**209**	**4.3**	**0.435**	**18.9**	**LOS C**	**17**	**0.65**	**0.87**	**34.4**
All Vehicles		**1332**	**5.4**	**0.436**	**7.0**	**Not Applicable**	**34**	**0.48**	**0.29**	**42.5**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Wha St_WoodAve Intersection DM

2019 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	121	5.8	0.195	7.3	LOS A	4	0.28	0.60	42.3
2	T	572	6.0	0.352	11.4	LOS B	74	0.99	0.00	39.2
3	R	20	5.0	0.351	18.0	LOS C	74	0.99	1.10	34.9
Approach		**712**	**5.9**	**0.352**	**10.9**	**LOS B**	**74**	**0.87**	**0.13**	**39.6**
Woodland Ave										
4	L	11	9.1	0.022	11.3	LOS B	1	0.56	0.75	39.3
5	T	6	14.3	0.226	64.5	LOS F	7	0.94	0.99	19.5
6	R	7	12.5	0.222	65.9	LOS F	7	0.94	0.99	19.3
Approach		**26**	**11.5**	**0.223**	**42.5**	**LOS E**	**7**	**0.78**	**0.89**	**24.7**
High St (N)										
7	L	20	5.0	0.312	6.7	LOS A	20	0.11	0.57	42.9
8	T	565	5.0	0.313	0.1	LOS A	20	0.11	0.00	49.0
9	R	166	4.8	0.401	16.2	LOS C	17	0.71	0.98	36.0
Approach		**751**	**4.9**	**0.401**	**3.8**	**LOS A**	**20**	**0.24**	**0.23**	**45.2**
Whakarewa St										
10	L	188	4.2	0.322	12.0	LOS B	13	0.61	0.90	38.8
11	T	3	25.0	1.333	337.6	LOS F	160	1.00	2.32	5.5
12	R	107	3.7	1.244	339.0	LOS F	160	1.00	2.39	5.4
Approach		**300**	**4.3**	**1.251**	**133.0**	**LOS F**	**160**	**0.76**	**1.45**	**11.9**
All Vehicles		**1789**	**5.3**	**1.333**	**28.9**	**Not Applicable**	**160**	**0.59**	**0.41**	**29.4**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Wha St_WoodAve Intersection DM

2009 AM Peak 08:30-09:30

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	81	6.2	0.129	7.1	LOS A	2	0.24	0.58	42.5
2	T	431	6.0	0.258	5.8	LOS A	34	0.79	0.00	43.5
3	R	15	6.7	0.259	12.5	LOS B	34	0.79	0.92	38.6
Approach		**527**	**6.1**	**0.258**	**6.2**	**LOS A**	**34**	**0.71**	**0.12**	**43.2**
Woodland Ave										
4	L	12	7.7	0.020	9.6	LOS A	1	0.49	0.69	40.7
5	T	8	12.5	0.110	28.6	LOS D	4	0.85	0.93	29.6
6	R	9	11.1	0.110	30.0	LOS D	4	0.85	0.94	29.0
Approach		**30**	**10.0**	**0.110**	**20.8**	**LOS C**	**4**	**0.70**	**0.83**	**33.3**
High St (N)										
7	L	15	6.7	0.234	6.6	LOS A	14	0.09	0.58	43.0
8	T	426	4.9	0.236	0.1	LOS A	14	0.09	0.00	49.2
9	R	125	4.8	0.230	11.4	LOS B	8	0.57	0.83	39.3
Approach		**566**	**4.9**	**0.236**	**2.7**	**LOS A**	**14**	**0.19**	**0.20**	**46.4**
Whakarewa St										
10	L	131	3.8	0.200	9.6	LOS A	6	0.51	0.77	40.7
11	T	3	33.3	0.429	33.1	LOS D	17	0.89	1.03	27.8
12	R	75	4.0	0.436	34.6	LOS D	17	0.89	1.05	27.3
Approach		**209**	**4.3**	**0.435**	**18.9**	**LOS C**	**17**	**0.65**	**0.87**	**34.4**
All Vehicles		**1332**	**5.4**	**0.436**	**7.0**	**Not Applicable**	**34**	**0.48**	**0.29**	**42.5**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Wha St_WoodAve Intersection DM

2009 PM Peak 16:30-17:30

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	99	2.0	0.154	7.0	LOS A	3	0.26	0.59	42.4
2	T	423	1.9	0.251	7.4	LOS A	36	0.85	0.00	42.4
3	R	14	6.7	0.250	14.0	LOS B	36	0.85	0.94	37.4
Approach		**536**	**2.1**	**0.251**	**7.5**	**LOS A**	**36**	**0.74**	**0.13**	**42.2**
Woodland Ave										
4	L	48	4.2	0.077	10.3	LOS B	3	0.53	0.77	40.2
5	T	8	12.5	0.138	33.5	LOS D	4	0.88	0.94	27.7
6	R	10	10.0	0.139	34.8	LOS D	4	0.88	0.95	27.2
Approach		**66**	**6.1**	**0.138**	**16.8**	**LOS C**	**4**	**0.62**	**0.82**	**35.7**
High St (N)										
7	L	20	4.8	0.276	6.6	LOS A	17	0.09	0.58	43.0
8	T	500	4.0	0.278	0.1	LOS A	17	0.09	0.00	49.2
9	R	147	4.1	0.263	11.4	LOS B	10	0.57	0.85	39.3
Approach		**668**	**4.0**	**0.278**	**2.8**	**LOS A**	**17**	**0.20**	**0.20**	**46.4**
Whakarewa St										
10	L	155	0.0	0.216	9.5	LOS A	7	0.52	0.78	40.7
11	T	1	0.0	0.500	36.5	LOS E	15	0.90	1.03	26.5
12	R	65	0.0	0.419	37.9	LOS E	15	0.90	1.04	26.1
Approach		**221**	**0.0**	**0.419**	**18.0**	**LOS C**	**15**	**0.63**	**0.86**	**34.9**
All Vehicles		**1491**	**2.8**	**0.500**	**7.4**	**Not Applicable**	**36**	**0.48**	**0.30**	**42.2**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Wha St_WoodAve Intersection DM

2019 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	155	1.9	0.250	7.5	LOS A	5	0.34	0.62	42.1
2	T	662	2.0	0.420	21.3	LOS C	111	1.00	0.00	33.0
3	R	22	4.3	0.418	27.9	LOS D	111	1.00	1.20	29.9
Approach		**840**	**2.0**	**0.420**	**18.9**	**LOS C**	**111**	**0.88**	**0.15**	**34.2**
Woodland Ave										
4	L	47	4.3	0.103	12.8	LOS B	3	0.64	0.86	38.3
5	T	7	12.5	0.533	171.0	LOS F	16	0.98	1.05	9.7
6	R	9	10.0	0.556	172.3	LOS F	16	0.98	1.05	9.7
Approach		**65**	**6.2**	**0.541**	**56.8**	**LOS F**	**16**	**0.74**	**0.91**	**21.1**
High St (N)										
7	L	29	3.4	0.397	6.7	LOS A	28	0.13	0.57	42.8
8	T	719	4.0	0.399	0.1	LOS A	28	0.13	0.00	48.8
9	R	223	4.0	0.646	23.7	LOS C	35	0.85	1.18	31.9
Approach		**971**	**4.0**	**0.646**	**5.7**	**LOS A**	**35**	**0.30**	**0.29**	**43.3**
Whakarewa St										
10	L	252	0.0	0.488	14.9	LOS B	23	0.72	1.02	36.8
11	T	1	0.0	1.000*	824.3	LOS F	252	1.00	2.82	2.4
12	R	104	0.0	1.763	825.7	LOS F	252	1.00	2.82	2.4
Approach		**357**	**0.0**	**1.750**	**253.4**	**LOS F**	**252**	**0.80**	**1.55**	**7.0**
All Vehicles		**2233**	**2.7**	**1.763**	**51.8**	**Not Applicable**	**252**	**0.61**	**0.46**	**22.1**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Wha St_WoodAve Intersection DM

2009 PM Peak 16:30-17:30

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	99	2.0	0.154	7.0	LOS A	3	0.26	0.59	42.4
2	T	423	1.9	0.251	7.4	LOS A	36	0.85	0.00	42.4
3	R	14	6.7	0.250	14.0	LOS B	36	0.85	0.94	37.4
Approach		**536**	**2.1**	**0.251**	**7.5**	**LOS A**	**36**	**0.74**	**0.13**	**42.2**
Woodland Ave										
4	L	48	4.2	0.077	10.3	LOS B	3	0.53	0.77	40.2
5	T	8	12.5	0.138	33.5	LOS D	4	0.88	0.94	27.7
6	R	10	10.0	0.139	34.8	LOS D	4	0.88	0.95	27.2
Approach		**66**	**6.1**	**0.138**	**16.8**	**LOS C**	**4**	**0.62**	**0.82**	**35.7**
High St (N)										
7	L	20	4.8	0.276	6.6	LOS A	17	0.09	0.58	43.0
8	T	500	4.0	0.278	0.1	LOS A	17	0.09	0.00	49.2
9	R	147	4.1	0.263	11.4	LOS B	10	0.57	0.85	39.3
Approach		**668**	**4.0**	**0.278**	**2.8**	**LOS A**	**17**	**0.20**	**0.20**	**46.4**
Whakarewa St										
10	L	155	0.0	0.216	9.5	LOS A	7	0.52	0.78	40.7
11	T	1	0.0	0.500	36.5	LOS E	15	0.90	1.03	26.5
12	R	65	0.0	0.419	37.9	LOS E	15	0.90	1.04	26.1
Approach		**221**	**0.0**	**0.419**	**18.0**	**LOS C**	**15**	**0.63**	**0.86**	**34.9**
All Vehicles		**1491**	**2.8**	**0.500**	**7.4**	**Not Applicable**	**36**	**0.48**	**0.30**	**42.2**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Wha St_WoodAve Intersection Option 2

2019 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	120	5.8	0.195	7.3	LOS A	4	0.30	0.60	42.2
2	T	462	6.1	0.285	8.1	LOS A	44	0.88	0.00	41.8
3	R	18	5.6	0.286	14.8	LOS B	44	0.88	0.97	36.9
Approach		**600**	**6.0**	**0.285**	**8.2**	**LOS A**	**44**	**0.76**	**0.15**	**41.7**
Woodland Ave										
4	L	11	9.1	0.020	10.8	LOS B	1	0.54	0.73	39.7
5	T	6	14.3	0.156	44.0	LOS E	5	0.91	0.96	24.3
6	R	7	12.5	0.157	45.4	LOS E	5	0.91	0.97	23.9
Approach		**26**	**11.5**	**0.157**	**30.4**	**LOS D**	**5**	**0.76**	**0.86**	**28.9**
High St (N)										
7	L	21	4.8	0.288	6.6	LOS A	18	0.10	0.57	42.9
8	T	513	5.1	0.287	0.1	LOS A	18	0.10	0.00	49.1
9	R	178	5.1	0.348	13.1	LOS B	15	0.62	0.91	38.1
Approach		**712**	**5.1**	**0.348**	**3.5**	**LOS A**	**18**	**0.23**	**0.25**	**45.6**
Whakarewa St										
10	L	171	4.1	0.255	10.3	LOS B	9	0.55	0.83	40.1
11	T	3	25.0	0.800	84.2	LOS F	43	0.98	1.33	16.5
12	R	98	4.1	0.831	85.6	LOS F	43	0.98	1.35	16.3
Approach		**273**	**4.4**	**0.833**	**38.4**	**LOS E**	**43**	**0.71**	**1.02**	**26.0**
All Vehicles		**1611**	**5.4**	**0.831**	**11.6**	**Not Applicable**	**44**	**0.52**	**0.35**	**38.9**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Wha St_WoodAve Intersection Option 2

2029 AM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	161	6.2	0.266	7.5	LOS A	5	0.33	0.62	42.1
2	T	612	6.0	0.408	14.0	LOS B	95	1.00	0.00	37.3
3	R	33	6.1	0.407	20.7	LOS C	95	1.00	1.17	33.4
Approach		**806**	**6.1**	**0.408**	**13.0**	**LOS B**	**95**	**0.87**	**0.17**	**38.0**
Woodland Ave										
4	L	11	9.1	0.021	11.3	LOS B	1	0.56	0.75	39.4
5	T	6	14.3	0.304	94.5	LOS F	9	0.96	1.01	15.2
6	R	7	12.5	0.308	95.9	LOS F	9	0.96	1.01	15.1
Approach		**26**	**11.5**	**0.309**	**59.7**	**LOS F**	**9**	**0.79**	**0.90**	**20.5**
High St (N)										
7	L	24	4.2	0.324	6.7	LOS A	21	0.15	0.57	42.7
8	T	581	5.0	0.325	0.2	LOS A	21	0.15	0.00	48.6
9	R	202	5.0	0.534	19.6	LOS C	26	0.79	1.08	34.0
Approach		**807**	**5.0**	**0.534**	**5.2**	**LOS A**	**26**	**0.31**	**0.29**	**43.7**
Whakarewa St										
10	L	261	3.8	0.481	14.4	LOS B	24	0.70	1.01	37.2
11	T	5	16.7	2.000	1257.2	LOS F	461	1.00	3.48	1.6
12	R	149	4.0	2.292	1258.5	LOS F	461	1.00	3.55	1.6
Approach		**416**	**4.1**	**2.292**	**477.9**	**LOS F**	**461**	**0.81**	**1.96**	**4.0**
All Vehicles		**2055**	**5.3**	**2.292**	**104.7**	**Not Applicable**	**461**	**0.64**	**0.59**	**14.1**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Wha St_WoodAve Intersection Option 2

2029 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	191	2.1	0.312	7.6	LOS A	7	0.37	0.64	42.0
2	T	618	1.9	0.427	31.5	LOS D	124	1.00	0.00	28.3
3	R	22	4.3	0.426	38.1	LOS E	124	1.00	1.22	26.1
Approach		**832**	**2.0**	**0.427**	**26.2**	**LOS D**	**124**	**0.86**	**0.18**	**30.6**
Woodland Ave										
4	L	47	4.3	0.125	14.8	LOS B	4	0.71	0.89	36.9
5	T	7	12.5	0.800	305.5	LOS F	24	0.99	1.09	6.0
6	R	9	10.0	0.769	306.9	LOS F	24	0.99	1.10	5.9
Approach		**65**	**6.2**	**0.763**	**95.5**	**LOS F**	**24**	**0.79**	**0.95**	**15.1**
High St (N)										
7	L	35	2.9	0.466	6.7	LOS A	36	0.15	0.56	42.8
8	T	842	4.0	0.467	0.2	LOS A	36	0.15	0.00	48.7
9	R	248	4.0	0.651	22.1	LOS C	37	0.83	1.19	32.7
Approach		**1124**	**4.0**	**0.651**	**5.2**	**LOS A**	**37**	**0.30**	**0.28**	**43.7**
Whakarewa St										
10	L	304	0.0	0.569	15.7	LOS C	31	0.74	1.08	36.3
11	T	1	0.0	1.000*	1196.8	LOS F	356	1.00	3.26	1.7
12	R	127	0.0	2.117	1198.2	LOS F	356	1.00	3.27	1.7
Approach		**432**	**0.0**	**2.133**	**366.1**	**LOS F**	**356**	**0.82**	**1.73**	**5.1**
All Vehicles		**2453**	**2.7**	**2.117**	**78.3**	**Not Applicable**	**356**	**0.59**	**0.52**	**17.2**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Wha St_WoodAve Intersection Option 2

2019 PM Peak

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	135	2.2	0.218	7.4	LOS A	4	0.34	0.62	42.1
2	T	574	1.9	0.352	14.1	LOS B	82	1.00	0.00	37.3
3	R	19	5.0	0.351	20.6	LOS C	82	1.00	1.12	33.4
Approach		**728**	**2.1**	**0.352**	**13.0**	**LOS B**	**82**	**0.88**	**0.15**	**38.0**
Woodland Ave										
4	L	47	4.3	0.092	11.8	LOS B	3	0.60	0.84	39.0
5	T	7	12.5	0.333	87.9	LOS F	10	0.96	1.01	16.0
6	R	9	10.0	0.333	89.2	LOS F	10	0.96	1.02	15.9
Approach		**65**	**6.2**	**0.333**	**33.1**	**LOS D**	**10**	**0.70**	**0.89**	**27.9**
High St (N)										
7	L	31	3.3	0.353	6.6	LOS A	24	0.12	0.57	42.9
8	T	633	4.0	0.354	0.1	LOS A	24	0.12	0.00	48.9
9	R	221	4.1	0.527	17.9	LOS C	27	0.75	1.06	35.0
Approach		**883**	**4.0**	**0.528**	**4.8**	**LOS A**	**27**	**0.28**	**0.29**	**44.3**
Whakarewa St										
10	L	252	0.0	0.431	13.0	LOS B	20	0.65	0.96	38.1
11	T	1	0.0	1.000	559.7	LOS F	207	1.00	2.62	3.4
12	R	104	0.0	1.486	561.1	LOS F	207	1.00	2.62	3.4
Approach		**357**	**0.0**	**1.496**	**174.2**	**LOS F**	**207**	**0.75**	**1.45**	**9.6**
All Vehicles		**2033**	**2.7**	**1.486**	**38.4**	**Not Applicable**	**207**	**0.59**	**0.46**	**25.8**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

Wha St_WoodAve Roundabout Option 4

2019 AM Peak

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	144	6.2	0.589	6.3	LOS A	48	0.59	0.58	42.2
2	T	555	6.0	0.589	5.3	LOS A	48	0.59	0.55	42.7
3	R	20	5.0	0.588	10.5	LOS B	48	0.59	0.64	39.6
Approach		**719**	**6.0**	**0.589**	**5.6**	**LOS A**	**48**	**0.59**	**0.56**	**42.5**
Woodland Ave										
4	L	11	9.1	0.047	10.7	LOS B	3	0.78	0.72	39.8
5	T	6	14.3	0.047	9.7	LOS A	3	0.78	0.71	40.6
6	R	7	12.5	0.047	14.9	LOS B	3	0.78	0.70	37.3
Approach		**26**	**11.5**	**0.047**	**11.7**	**LOS B**	**3**	**0.78**	**0.71**	**39.2**
High St (N)										
7	L	20	5.0	0.588	6.0	LOS A	50	0.56	0.55	42.3
8	T	563	5.0	0.588	5.0	LOS A	50	0.56	0.51	42.9
9	R	165	4.8	0.587	10.2	LOS B	50	0.56	0.63	39.7
Approach		**748**	**4.9**	**0.588**	**6.2**	**LOS A**	**50**	**0.56**	**0.54**	**42.1**
Whakarewa St										
10	L	220	4.1	0.443	9.2	LOS A	29	0.80	0.84	41.0
11	T	4	20.0	0.455	8.2	LOS A	29	0.80	0.85	41.7
12	R	125	4.0	0.442	13.5	LOS B	29	0.80	0.81	38.3
Approach		**350**	**4.3**	**0.442**	**10.7**	**LOS B**	**29**	**0.80**	**0.83**	**39.9**
All Vehicles		**1843**	**5.3**	**0.589**	**6.9**	**LOS A**	**50**	**0.62**	**0.60**	**41.8**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue

SIDRA INTERSECTION

Movement Summary

Wha St_WoodAve Roundabout Option 4

2029 AM Peak

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	180	6.1	0.766	8.3	LOS A	92	0.84	0.72	41.1
2	T	693	6.1	0.765	7.3	LOS A	92	0.84	0.71	41.5
3	R	25	7.7	0.765	12.6	LOS B	92	0.84	0.73	38.9
Approach		**899**	**6.1**	**0.765**	**7.7**	**LOS A**	**92**	**0.84**	**0.71**	**41.3**
Woodland Ave										
4	L	11	9.1	0.065	13.5	LOS B	4	0.90	0.80	37.8
5	T	6	14.3	0.065	12.5	LOS B	4	0.90	0.81	38.5
6	R	7	12.5	0.065	17.8	LOS B	4	0.90	0.72	35.6
Approach		**26**	**11.5**	**0.065**	**14.6**	**LOS B**	**4**	**0.90**	**0.78**	**37.2**
High St (N)										
7	L	24	4.2	0.750	7.3	LOS A	83	0.79	0.66	41.3
8	T	676	5.0	0.742	6.3	LOS A	83	0.79	0.64	41.7
9	R	198	5.1	0.742	11.5	LOS B	83	0.79	0.67	39.0
Approach		**898**	**5.0**	**0.742**	**7.5**	**LOS A**	**83**	**0.79**	**0.65**	**41.0**
Whakarewa St										
10	L	280	3.9	0.705	17.3	LOS B	72	1.00	1.20	35.3
11	T	5	16.7	0.667	16.3	LOS B	72	1.00	1.19	35.9
12	R	160	3.8	0.705	21.6	LOS C	72	1.00	1.09	33.5
Approach		**446**	**4.0**	**0.705**	**18.8**	**LOS B**	**72**	**1.00**	**1.16**	**34.6**
All Vehicles		**2269**	**5.3**	**0.766**	**9.9**	**LOS A**	**92**	**0.85**	**0.77**	**39.6**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue

SIDRA INTERSECTION

Movement Summary

Wha St_WoodAve Roundabout Option 4

2019 PM Peak

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	167	1.8	0.723	8.0	LOS A	75	0.79	0.72	41.3
2	T	649	2.0	0.722	7.0	LOS A	75	0.79	0.70	41.7
3	R	22	4.3	0.719	12.2	LOS B	75	0.79	0.73	39.0
Approach		**839**	**2.0**	**0.722**	**7.3**	**LOS A**	**75**	**0.79**	**0.70**	**41.6**
Woodland Ave										
4	L	47	4.3	0.146	13.5	LOS B	9	0.91	0.86	37.8
5	T	7	12.5	0.145	12.5	LOS B	9	0.91	0.87	38.5
6	R	9	10.0	0.147	17.8	LOS B	9	0.91	0.78	35.6
Approach		**65**	**6.2**	**0.146**	**14.0**	**LOS B**	**9**	**0.91**	**0.85**	**37.5**
High St (N)										
7	L	28	3.6	0.718	6.2	LOS A	77	0.69	0.57	41.7
8	T	702	4.0	0.726	5.2	LOS A	77	0.69	0.54	42.2
9	R	218	4.1	0.727	10.5	LOS B	77	0.69	0.61	39.3
Approach		**948**	**4.0**	**0.726**	**6.5**	**LOS A**	**77**	**0.69**	**0.56**	**41.5**
Whakarewa St										
10	L	281	0.0	0.581	12.6	LOS B	48	0.94	1.03	38.4
11	T	1	0.0	0.500	11.6	LOS B	48	0.94	1.02	39.1
12	R	117	0.0	0.582	16.8	LOS B	48	0.94	0.95	36.1
Approach		**399**	**0.0**	**0.581**	**13.8**	**LOS B**	**48**	**0.94**	**1.01**	**37.6**
All Vehicles		**2251**	**2.6**	**0.727**	**8.3**	**LOS A**	**77**	**0.78**	**0.70**	**40.6**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue

SIDRA INTERSECTION

Movement Summary

Wha St_WoodAve Roundabout Option 4

2029 PM Peak

Roundabout

Vehicle Movements

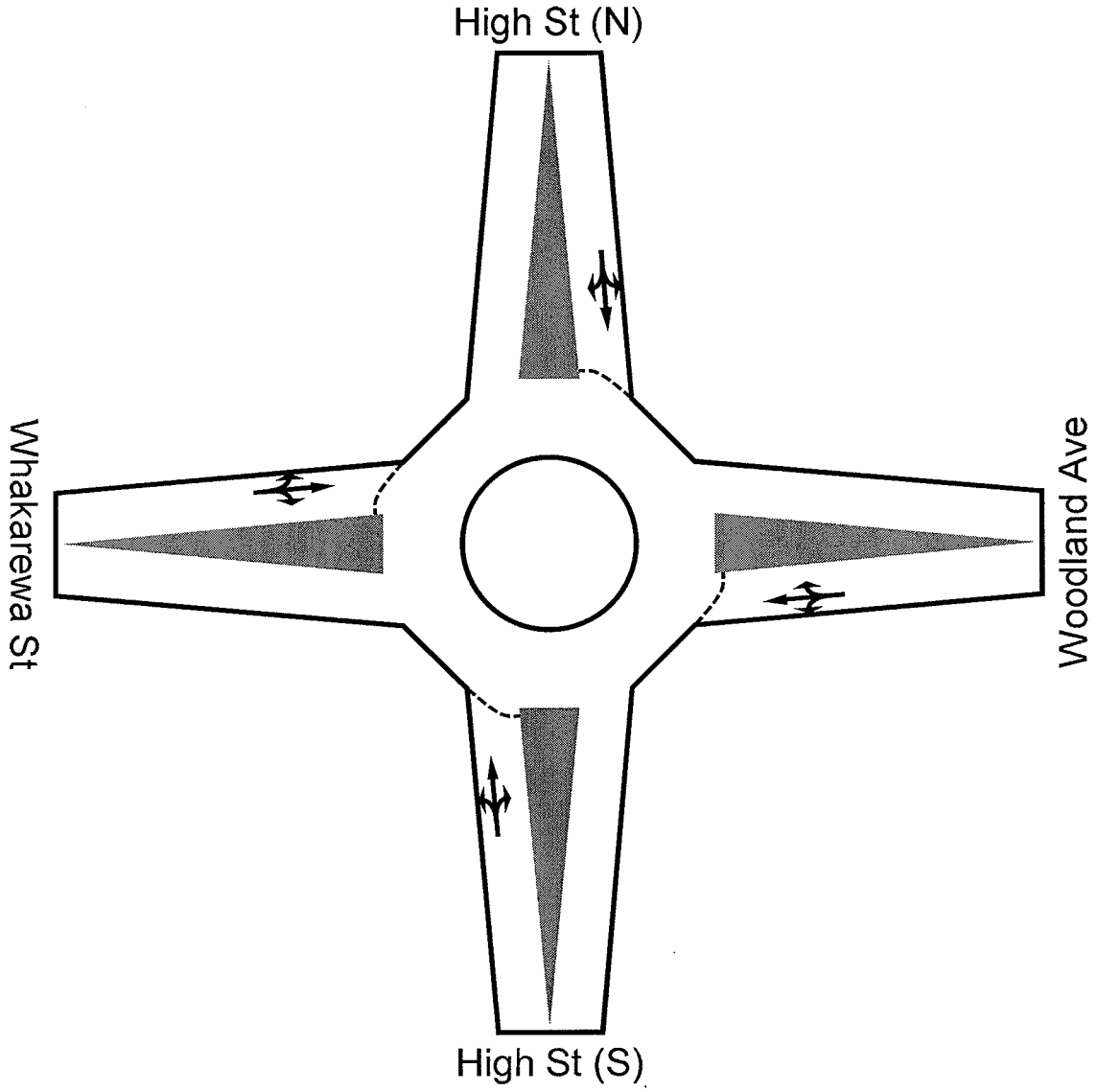
Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	207	1.9	0.928	18.0	LOS B	203	1.00	1.11	34.9
2	T	802	2.0	0.929	17.0	LOS B	203	1.00	1.11	35.5
3	R	27	3.6	0.933	22.2	LOS C	203	1.00	1.07	33.1
Approach		**1037**	**2.0**	**0.929**	**17.3**	**LOS B**	**203**	**1.00**	**1.11**	**35.3**
Woodland Ave										
4	L	47	4.3	0.244	19.0	LOS B	17	1.00	0.97	34.3
5	T	7	12.5	0.242	18.0	LOS B	17	1.00	0.99	34.9
6	R	9	10.0	0.244	23.3	LOS C	17	1.00	0.81	32.6
Approach		**65**	**6.2**	**0.243**	**19.6**	**LOS B**	**17**	**1.00**	**0.95**	**34.1**
High St (N)										
7	L	35	2.9	0.895	11.0	LOS B	168	1.00	0.79	39.6
8	T	839	4.1	0.896	10.0	LOS A	168	1.00	0.79	40.4
9	R	247	4.0	0.895	15.2	LOS B	168	1.00	0.76	37.1
Approach		**1120**	**4.0**	**0.897**	**11.2**	**LOS B**	**168**	**1.00**	**0.79**	**39.6**
Whakarewa St										
10	L	372	0.0	1.028	88.5	LOS F	266	1.00	2.42	15.9
11	T	1	0.0	1.000	87.5	LOS F	266	1.00	2.42	16.1
12	R	155	0.0	1.026	92.7	LOS F	266	1.00	2.35	16.0
Approach		**528**	**0.0**	**1.028**	**89.7**	**LOS F**	**266**	**1.00**	**2.40**	**16.0**
All Vehicles		**2750**	**2.5**	**1.028**	**28.8**	**LOS C**	**266**	**1.00**	**1.22**	**29.6**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue


High St (N)
Whakarewa St
Woodland Ave
High St (S)

SIDRA INTERSECTION

Movement Summary

Wha St_WoodAve Intersection Option

2009 AM Peak 08:30-09:30

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	81	6.2	0.415	5.7	LOS A	27	0.41	0.52	43.0
2	T	431	6.0	0.416	4.7	LOS A	27	0.41	0.47	43.6
3	R	15	6.7	0.417	10.0	LOS A	27	0.41	0.63	40.2
Approach		**527**	**6.1**	**0.416**	**5.0**	**LOS A**	**27**	**0.41**	**0.48**	**43.4**
Woodland Ave										
4	L	12	7.7	0.040	8.3	LOS A	2	0.64	0.64	41.7
5	T	8	12.5	0.040	7.3	LOS A	2	0.64	0.61	42.5
6	R	9	11.1	0.040	12.6	LOS B	2	0.64	0.67	38.9
Approach		**30**	**10.0**	**0.040**	**9.3**	**LOS A**	**2**	**0.64**	**0.64**	**41.0**
High St (N)										
7	L	15	6.7	0.417	5.3	LOS A	29	0.35	0.48	43.3
8	T	426	4.9	0.415	4.3	LOS A	29	0.35	0.42	44.0
9	R	125	4.8	0.415	9.6	LOS A	29	0.35	0.61	40.4
Approach		**566**	**4.9**	**0.415**	**5.5**	**LOS A**	**29**	**0.35**	**0.47**	**43.1**
Whakarewa St										
10	L	131	3.8	0.229	7.4	LOS A	13	0.62	0.68	42.1
11	T	3	33.3	0.231	6.3	LOS A	13	0.62	0.67	42.6
12	R	75	4.0	0.229	11.7	LOS B	13	0.62	0.72	39.5
Approach		**209**	**4.3**	**0.229**	**8.9**	**LOS A**	**13**	**0.62**	**0.69**	**41.1**
All Vehicles		**1332**	**5.4**	**0.417**	**5.9**	**LOS A**	**29**	**0.42**	**0.51**	**42.8**

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* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue

SIDRA INTERSECTION

Movement Summary

Wha St_WoodAve Intersection Option

2019 AM Peak

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	121	5.8	0.582	6.3	LOS A	46	0.58	0.58	42.2
2	T	572	6.0	0.583	5.3	LOS A	46	0.58	0.54	42.8
3	R	20	5.0	0.588	10.5	LOS B	46	0.58	0.65	39.6
Approach		**712**	**5.9**	**0.583**	**5.6**	**LOS A**	**46**	**0.58**	**0.55**	**42.6**
Woodland Ave										
4	L	11	9.1	0.045	10.5	LOS B	3	0.77	0.71	40.0
5	T	6	14.3	0.045	9.5	LOS A	3	0.77	0.70	40.8
6	R	7	12.5	0.045	14.8	LOS B	3	0.77	0.70	37.4
Approach		**26**	**11.5**	**0.045**	**11.5**	**LOS B**	**3**	**0.77**	**0.71**	**39.3**
High St (N)										
7	L	20	5.0	0.571	5.8	LOS A	48	0.52	0.53	42.5
8	T	565	5.0	0.575	4.8	LOS A	48	0.52	0.49	43.1
9	R	166	4.8	0.574	10.1	LOS B	48	0.52	0.61	39.8
Approach		**751**	**4.9**	**0.574**	**6.0**	**LOS A**	**48**	**0.52**	**0.52**	**42.3**
Whakarewa St										
10	L	188	4.2	0.386	8.9	LOS A	24	0.78	0.81	41.2
11	T	3	25.0	0.400	7.9	LOS A	24	0.78	0.83	41.7
12	R	107	3.7	0.385	13.2	LOS B	24	0.78	0.79	38.5
Approach		**300**	**4.3**	**0.386**	**10.4**	**LOS B**	**24**	**0.78**	**0.80**	**40.2**
All Vehicles		**1789**	**5.3**	**0.588**	**6.6**	**LOS A**	**48**	**0.59**	**0.58**	**42.0**

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Following LOS
- Based on density for continuous movements

Following Queue

SIDRA INTERSECTION

Movement Summary

Wha St_WoodAve Intersection Option

2029 AM Peak

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	153	5.9	0.764	8.4	LOS A	92	0.84	0.73	41.1
2	T	720	6.0	0.765	7.4	LOS A	92	0.84	0.71	41.5
3	R	25	7.7	0.765	12.7	LOS B	92	0.84	0.73	38.8
Approach		**898**	**6.0**	**0.766**	**7.7**	**LOS A**	**92**	**0.84**	**0.72**	**41.3**
Woodland Ave										
4	L	11	9.1	0.064	13.5	LOS B	4	0.89	0.80	37.8
5	T	6	14.3	0.064	12.5	LOS B	4	0.89	0.80	38.5
6	R	7	12.5	0.064	17.7	LOS B	4	0.89	0.72	35.6
Approach		**26**	**11.5**	**0.064**	**14.5**	**LOS B**	**4**	**0.89**	**0.78**	**37.2**
High St (N)										
7	L	24	4.2	0.727	6.8	LOS A	79	0.77	0.62	41.4
8	T	685	5.0	0.737	5.8	LOS A	79	0.77	0.60	41.8
9	R	201	5.0	0.736	11.0	LOS B	79	0.77	0.65	39.1
Approach		**910**	**4.9**	**0.737**	**7.0**	**LOS A**	**79**	**0.77**	**0.61**	**41.2**
Whakarewa St										
10	L	254	3.9	0.665	16.5	LOS B	63	1.00	1.17	35.8
11	T	5	16.7	0.667	15.5	LOS B	63	1.00	1.16	36.5
12	R	145	4.1	0.665	20.8	LOS C	63	1.00	1.06	33.9
Approach		**405**	**4.2**	**0.664**	**18.0**	**LOS B**	**63**	**1.00**	**1.13**	**35.1**
All Vehicles		**2239**	**5.3**	**0.765**	**9.4**	**LOS A**	**92**	**0.84**	**0.75**	**39.9**

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Following LOS
- Based on density for continuous movements

Following Queue

SIDRA INTERSECTION

Movement Summary

Wha St_WoodAve Intersection Option

2009 PM Peak 16:30-17:30

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	99	2.0	0.429	5.8	LOS A	27	0.45	0.54	42.8
2	T	423	1.9	0.429	4.8	LOS A	27	0.45	0.49	43.4
3	R	14	6.7	0.429	10.0	LOS B	27	0.45	0.64	40.0
Approach		**536**	**2.1**	**0.429**	**5.1**	**LOS A**	**27**	**0.45**	**0.50**	**43.2**
Woodland Ave										
4	L	48	4.2	0.091	9.1	LOS A	5	0.70	0.70	41.1
5	T	8	12.5	0.091	8.1	LOS A	5	0.70	0.69	42.0
6	R	10	10.0	0.091	13.3	LOS B	5	0.70	0.72	38.4
Approach		**66**	**6.1**	**0.091**	**9.6**	**LOS A**	**5**	**0.70**	**0.71**	**40.8**
High St (N)										
7	L	20	4.8	0.477	5.3	LOS A	35	0.34	0.47	43.3
8	T	500	4.0	0.473	4.3	LOS A	35	0.34	0.42	44.0
9	R	147	4.1	0.473	9.5	LOS A	35	0.34	0.60	40.4
Approach		**668**	**4.0**	**0.473**	**5.5**	**LOS A**	**35**	**0.34**	**0.46**	**43.1**
Whakarewa St										
10	L	155	0.0	0.239	7.2	LOS A	13	0.62	0.67	42.1
11	T	1	0.0	0.250	6.3	LOS A	13	0.62	0.64	42.6
12	R	65	0.0	0.239	11.5	LOS B	13	0.62	0.72	39.5
Approach		**221**	**0.0**	**0.239**	**8.5**	**LOS A**	**13**	**0.62**	**0.69**	**41.3**
All Vehicles		**1491**	**2.8**	**0.477**	**6.0**	**LOS A**	**35**	**0.44**	**0.52**	**42.7**

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* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue

SIDRA INTERSECTION

Movement Summary

Wha St_WoodAve Intersection Option

2019 PM Peak

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	155	1.9	0.728	8.2	LOS A	76	0.80	0.73	41.3
2	T	662	2.0	0.726	7.2	LOS A	76	0.80	0.71	41.7
3	R	22	4.3	0.719	12.4	LOS B	76	0.80	0.74	38.9
Approach		**840**	**2.0**	**0.726**	**7.5**	**LOS A**	**76**	**0.80**	**0.71**	**41.5**
Woodland Ave										
4	L	47	4.3	0.147	13.7	LOS B	9	0.91	0.86	37.7
5	T	7	12.5	0.148	12.7	LOS B	9	0.91	0.88	38.4
6	R	9	10.0	0.147	17.9	LOS B	9	0.91	0.78	35.5
Approach		**65**	**6.2**	**0.148**	**14.2**	**LOS B**	**9**	**0.91**	**0.85**	**37.4**
High St (N)										
7	L	29	3.4	0.725	6.1	LOS A	79	0.67	0.55	41.8
8	T	719	4.0	0.729	5.1	LOS A	79	0.67	0.52	42.3
9	R	223	4.0	0.729	10.4	LOS B	79	0.67	0.60	39.4
Approach		**971**	**4.0**	**0.729**	**6.3**	**LOS A**	**79**	**0.67**	**0.54**	**41.6**
Whakarewa St										
10	L	252	0.0	0.528	11.7	LOS B	40	0.92	0.99	39.0
11	T	1	0.0	0.500	10.7	LOS B	40	0.92	0.98	39.7
12	R	104	0.0	0.528	16.0	LOS B	40	0.92	0.92	36.6
Approach		**357**	**0.0**	**0.529**	**13.0**	**LOS B**	**40**	**0.92**	**0.97**	**38.2**
All Vehicles		**2233**	**2.7**	**0.729**	**8.1**	**LOS A**	**79**	**0.76**	**0.68**	**40.8**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue

SIDRA INTERSECTION

Movement Summary

Wha St_WoodAve Intersection Option

2029 PM Peak

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High St (S)										
1	L	192	2.1	0.941	19.8	LOS B	217	1.00	1.18	33.8
2	T	818	2.0	0.939	18.8	LOS B	217	1.00	1.18	34.4
3	R	27	3.6	0.933	24.1	LOS C	217	1.00	1.14	32.2
Approach		**1038**	**2.0**	**0.939**	**19.1**	**LOS B**	**217**	**1.00**	**1.18**	**34.2**
Woodland Ave										
4	L	47	4.3	0.257	20.1	LOS C	18	1.00	0.98	33.7
5	T	7	12.5	0.258	19.0	LOS B	18	1.00	1.00	34.3
6	R	9	10.0	0.256	24.3	LOS C	18	1.00	0.81	32.2
Approach		**65**	**6.2**	**0.256**	**20.6**	**LOS C**	**18**	**1.00**	**0.95**	**33.5**
High St (N)										
7	L	36	2.9	0.897	10.6	LOS B	177	1.00	0.76	39.9
8	T	867	4.0	0.907	9.6	LOS A	177	1.00	0.76	40.7
9	R	256	3.9	0.908	14.9	LOS B	177	1.00	0.73	37.3
Approach		**1159**	**4.0**	**0.907**	**10.8**	**LOS B**	**177**	**1.00**	**0.75**	**39.8**
Whakarewa St										
10	L	324	0.0	0.918	45.6	LOS D	144	1.00	1.67	23.8
11	T	1	0.0	1.000	44.6	LOS D	144	1.00	1.67	24.1
12	R	135	0.0	0.918	49.9	LOS D	144	1.00	1.58	23.3
Approach		**460**	**0.0**	**0.919**	**46.8**	**LOS D**	**144**	**1.00**	**1.64**	**23.7**
All Vehicles		**2722**	**2.6**	**1.000**	**20.3**	**LOS C**	**217**	**1.00**	**1.07**	**33.7**

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Following Degree of Saturation
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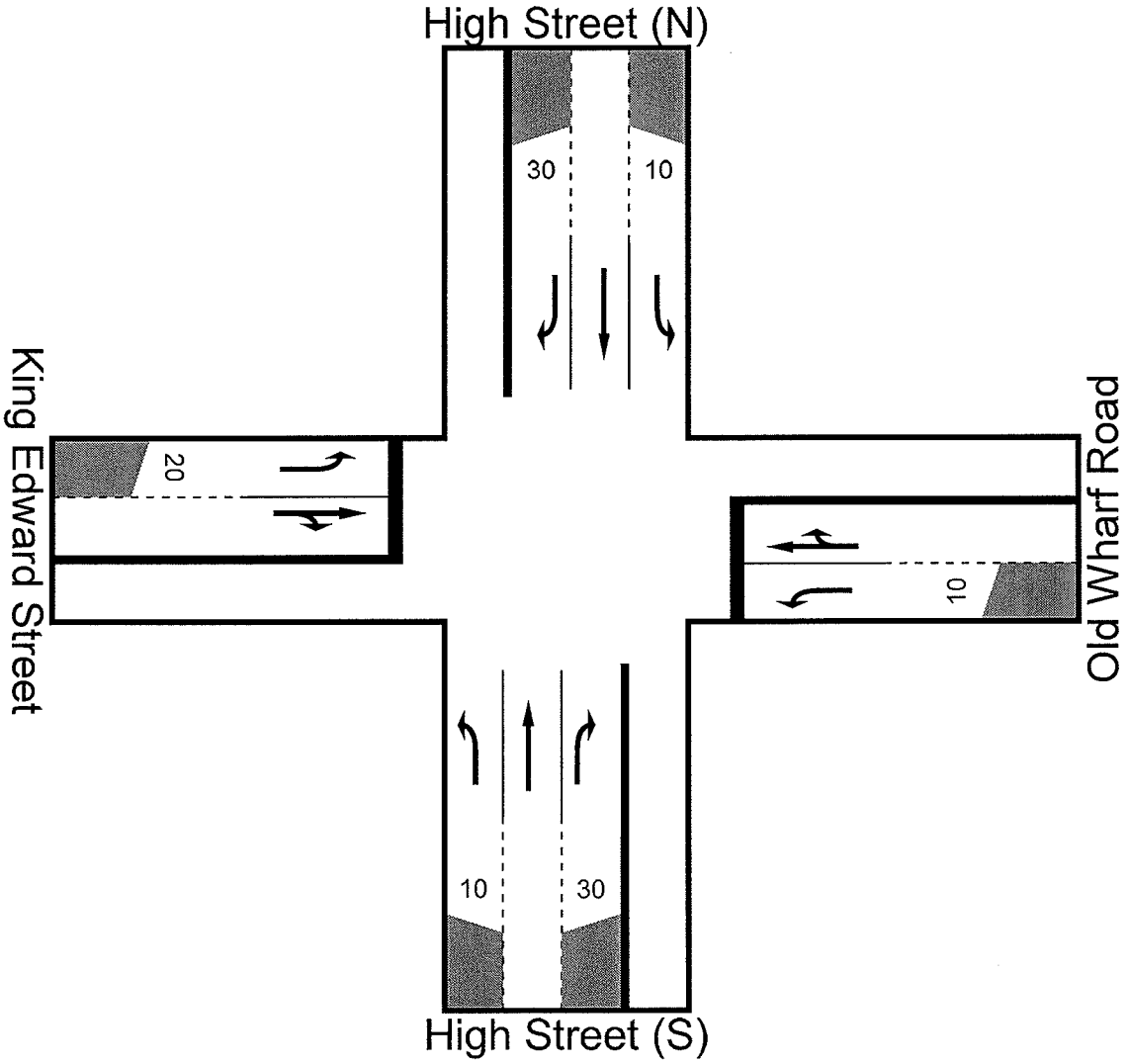
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue


High Street (N)
30
10
King Edward Street
20
Old Wharf Road
10
10
30
High Street (S)

SIDRA INTERSECTION

Movement Summary

King Ed_Old Wha Intersection DM

2009 AM Peak 08:30-09:30

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
1	L	63	7.9	0.101	6.5	LOS A	2	0.18	0.53	43.0
2	T	370	8.1	0.200	0.0	LOS A	0	0.00	0.00	50.0
3	R	27	7.4	0.040	9.1	LOS A	1	0.42	0.66	41.2
Approach		**460**	**8.0**	**0.200**	**1.4**	**LOS A**	**2**	**0.05**	**0.11**	**48.3**
Old Wharf Road										
4	L	67	4.5	0.139	11.6	LOS B	3	0.43	0.90	39.9
5	T	23	4.3	0.155	22.2	LOS C	5	0.76	1.00	33.5
6	R	20	5.0	0.156	22.2	LOS C	5	0.76	1.00	33.5
Approach		**110**	**4.5**	**0.156**	**15.7**	**LOS C**	**5**	**0.56**	**0.94**	**37.2**
High Street (N)										
7	L	48	6.2	0.073	6.2	LOS A	1	0.12	0.52	43.2
8	T	283	6.0	0.151	0.0	LOS A	0	0.00	0.00	50.0
9	R	79	6.2	0.136	10.4	LOS B	5	0.51	0.77	40.1
Approach		**411**	**6.1**	**0.151**	**2.8**	**LOS A**	**5**	**0.11**	**0.21**	**46.9**
King Edward Street										
10	L	133	11.3	0.218	13.1	LOS B	7	0.50	0.95	39.4
11	T	15	13.3	0.326	27.8	LOS D	13	0.82	1.06	30.9
12	R	63	11.1	0.325	27.8	LOS D	13	0.82	1.06	30.9
Approach		**211**	**11.4**	**0.324**	**18.5**	**LOS C**	**13**	**0.62**	**0.99**	**35.8**
All Vehicles		**1192**	**7.6**	**0.326**	**6.2**	**Not Applicable**	**13**	**0.22**	**0.38**	**43.9**

Symbols which may appear in this table:

Following Degree of Saturation
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* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

King Ed_Old Wha Intersection DM

2019 AM Peak

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
1	L	95	8.4	0.158	6.7	LOS A	3	0.25	0.55	42.7
2	T	464	8.0	0.250	0.0	LOS A	0	0.00	0.00	50.0
3	R	35	8.6	0.069	11.4	LOS B	2	0.53	0.77	39.4
Approach		**594**	**8.1**	**0.250**	**1.7**	**LOS A**	**3**	**0.07**	**0.13**	**47.9**
Old Wharf Road										
4	L	89	4.5	0.211	13.2	LOS B	5	0.53	0.97	38.9
5	T	31	6.5	0.413	45.3	LOS E	15	0.92	1.07	24.5
6	R	26	3.8	0.413	45.3	LOS E	15	0.92	1.07	24.5
Approach		**146**	**4.8**	**0.414**	**25.7**	**LOS D**	**15**	**0.68**	**1.01**	**31.6**
High Street (N)										
7	L	71	5.7	0.107	6.3	LOS A	2	0.16	0.52	43.1
8	T	438	5.9	0.233	0.0	LOS A	0	0.00	0.00	50.0
9	R	136	5.9	0.274	12.7	LOS B	11	0.60	0.88	38.3
Approach		**644**	**5.9**	**0.274**	**3.4**	**LOS A**	**11**	**0.14**	**0.24**	**46.2**
King Edward Street										
10	L	186	10.8	0.309	15.0	LOS B	13	0.59	1.04	38.3
11	T	20	10.0	0.909	107.2	LOS F	58	0.99	1.50	14.2
12	R	88	11.2	0.899	107.2	LOS F	58	0.99	1.51	14.2
Approach		**295**	**10.8**	**0.901**	**49.0**	**LOS E**	**58**	**0.74**	**1.21**	**23.6**
All Vehicles		**1679**	**7.4**	**0.909**	**12.8**	**Not Applicable**	**58**	**0.27**	**0.44**	**38.6**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

King Ed_Old Wha Intersection DM

2029 AM Peak

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
1	L	99	8.1	0.172	7.2	LOS A	3	0.35	0.59	42.3
2	T	574	8.0	0.310	0.0	LOS A	0	0.00	0.00	50.0
3	R	42	7.1	0.090	12.3	LOS B	3	0.56	0.82	38.7
Approach		**715**	**8.0**	**0.310**	**1.7**	**LOS A**	**3**	**0.08**	**0.13**	**48.0**
Old Wharf Road										
4	L	101	5.0	0.247	13.8	LOS B	6	0.55	1.00	38.5
5	T	44	4.5	1.023	210.4	LOS F	69	1.00	1.60	8.3
6	R	32	6.2	1.032	210.5	LOS F	69	1.00	1.61	8.3
Approach		**177**	**5.1**	**1.025**	**98.2**	**LOS F**	**69**	**0.75**	**1.26**	**15.0**
High Street (N)										
7	L	81	6.2	0.124	6.3	LOS A	2	0.18	0.52	43.0
8	T	495	6.1	0.264	0.0	LOS A	0	0.00	0.00	50.0
9	R	236	5.9	0.597	20.3	LOS C	33	0.80	1.13	33.7
Approach		**812**	**6.0**	**0.597**	**6.5**	**LOS A**	**33**	**0.25**	**0.38**	**43.2**
King Edward Street										
10	L	254	11.0	0.498	18.6	LOS C	27	0.71	1.14	36.0
11	T	27	11.1	2.455	1332.8	LOS F	477	1.00	3.46	1.5
12	R	121	10.7	2.373	1332.8	LOS F	477	1.00	3.48	1.5
Approach		**402**	**10.9**	**2.364**	**502.5**	**LOS F**	**477**	**0.82**	**2.00**	**3.9**
All Vehicles		**2106**	**7.5**	**2.455**	**107.3**	**Not Applicable**	**477**	**0.34**	**0.68**	**14.0**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

King Ed_Old Wha Intersection DM

2009 PM Peak 16:30-17:30

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
1	L	64	4.7	0.100	6.5	LOS A	2	0.22	0.54	42.8
2	T	278	4.0	0.146	0.0	LOS A	0	0.00	0.00	50.0
3	R	49	4.1	0.075	9.4	LOS A	3	0.45	0.70	40.9
Approach		**391**	**4.1**	**0.146**	**2.2**	**LOS A**	**3**	**0.09**	**0.18**	**47.4**
Old Wharf Road										
4	L	56	1.8	0.119	11.6	LOS B	2	0.44	0.91	39.8
5	T	14	7.1	0.154	21.9	LOS C	5	0.76	1.00	33.6
6	R	28	3.4	0.154	21.9	LOS C	5	0.76	1.00	33.6
Approach		**100**	**3.0**	**0.155**	**16.0**	**LOS C**	**5**	**0.58**	**0.95**	**36.9**
High Street (N)										
7	L	48	2.1	0.070	6.2	LOS A	1	0.13	0.53	43.2
8	T	326	3.1	0.171	0.0	LOS A	0	0.00	0.00	50.0
9	R	118	3.4	0.167	9.1	LOS A	6	0.44	0.71	41.1
Approach		**491**	**3.1**	**0.171**	**2.8**	**LOS A**	**6**	**0.12**	**0.22**	**46.8**
King Edward Street										
10	L	167	4.8	0.237	11.8	LOS B	7	0.44	0.92	40.1
11	T	23	4.3	0.307	24.1	LOS C	12	0.79	1.05	32.5
12	R	65	4.7	0.305	24.1	LOS C	12	0.79	1.05	32.6
Approach		**253**	**4.7**	**0.305**	**16.0**	**LOS C**	**12**	**0.56**	**0.96**	**37.2**
All Vehicles		**1235**	**3.7**	**0.307**	**6.4**	**Not Applicable**	**12**	**0.24**	**0.42**	**43.7**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

King Ed_Old Wha Intersection DM

2019 PM Peak

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
1	L	93	4.3	0.151	6.9	LOS A	3	0.31	0.57	42.5
2	T	404	4.0	0.213	0.0	LOS A	0	0.00	0.00	50.0
3	R	72	4.2	0.148	12.0	LOS B	5	0.57	0.84	38.9
Approach		**569**	**4.0**	**0.213**	**2.6**	**LOS A**	**5**	**0.12**	**0.20**	**46.9**
Old Wharf Road										
4	L	80	1.2	0.196	13.6	LOS B	4	0.56	0.99	38.5
5	T	19	5.0	0.500	54.1	LOS F	18	0.94	1.09	22.2
6	R	40	2.4	0.500	54.1	LOS F	18	0.94	1.10	22.2
Approach		**141**	**2.1**	**0.502**	**31.1**	**LOS D**	**18**	**0.72**	**1.03**	**29.2**
High Street (N)										
7	L	74	2.7	0.110	6.3	LOS A	2	0.17	0.53	43.0
8	T	497	3.0	0.260	0.0	LOS A	0	0.00	0.00	50.0
9	R	200	3.0	0.347	11.9	LOS B	15	0.59	0.90	38.9
Approach		**770**	**3.0**	**0.347**	**3.7**	**LOS A**	**15**	**0.17**	**0.28**	**45.9**
King Edward Street										
10	L	281	5.0	0.430	14.4	LOS B	20	0.59	1.08	38.4
11	T	39	5.1	1.182	261.0	LOS F	170	1.00	2.53	6.9
12	R	108	4.6	1.187	261.0	LOS F	170	1.00	2.55	6.9
Approach		**428**	**4.9**	**1.183**	**99.1**	**LOS F**	**170**	**0.73**	**1.58**	**15.1**
All Vehicles		**1908**	**3.7**	**1.187**	**26.8**	**Not Applicable**	**170**	**0.32**	**0.61**	**30.6**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

King Ed_Old Wha Intersection DM

2029 PM Peak

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
1	L	112	3.6	0.188	7.4	LOS A	4	0.38	0.61	42.2
2	T	486	3.9	0.256	0.0	LOS A	0	0.00	0.00	50.0
3	R	85	3.5	0.220	14.8	LOS B	7	0.68	0.89	36.9
Approach		**682**	**3.8**	**0.256**	**3.0**	**LOS A**	**7**	**0.15**	**0.21**	**46.5**
Old Wharf Road										
4	L	95	1.1	0.246	14.8	LOS B	6	0.60	1.02	37.7
5	T	23	4.2	1.200	336.8	LOS F	101	1.00	1.85	5.5
6	R	47	2.1	1.171	336.8	LOS F	101	1.00	1.86	5.5
Approach		**167**	**1.8**	**1.185**	**153.6**	**LOS F**	**101**	**0.77**	**1.38**	**10.7**
High Street (N)										
7	L	88	3.4	0.136	6.4	LOS A	3	0.19	0.54	43.0
8	T	613	2.9	0.320	0.0	LOS A	0	0.00	0.00	50.0
9	R	286	3.1	0.577	16.5	LOS C	34	0.72	1.08	35.8
Approach		**988**	**3.0**	**0.577**	**5.4**	**LOS A**	**34**	**0.22**	**0.36**	**44.2**
King Edward Street										
10	L	340	5.0	0.542	16.8	LOS C	32	0.68	1.16	37.0
11	T	46	4.3	2.875	1777.4	LOS F	602	1.00	3.69	1.1
12	R	132	5.3	2.870	1777.5	LOS F	602	1.00	3.72	1.1
Approach		**518**	**5.0**	**2.864**	**621.8**	**LOS F**	**602**	**0.79**	**2.04**	**3.2**
All Vehicles		**2355**	**3.6**	**2.875**	**150.8**	**Not Applicable**	**602**	**0.37**	**0.76**	**10.8**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

King Ed_Old Wha Intersection Option 2

2019 AM Peak

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
1	L	93	7.6	0.151	6.7	LOS A	3	0.26	0.55	42.7
2	T	385	8.1	0.208	0.0	LOS A	0	0.00	0.00	50.0
3	R	36	8.3	0.062	10.3	LOS B	2	0.49	0.73	40.2
Approach		**513**	**8.0**	**0.208**	**1.9**	**LOS A**	**3**	**0.08**	**0.15**	**47.7**
Old Wharf Road										
4	L	89	4.5	0.199	12.5	LOS B	4	0.50	0.94	39.4
5	T	31	6.5	0.310	33.4	LOS D	11	0.87	1.05	28.5
6	R	26	3.8	0.310	33.4	LOS D	11	0.87	1.05	28.5
Approach		**146**	**4.8**	**0.310**	**20.6**	**LOS C**	**11**	**0.64**	**0.98**	**34.3**
High Street (N)										
7	L	77	6.5	0.118	6.3	LOS A	2	0.18	0.51	43.0
8	T	371	5.9	0.197	0.0	LOS A	0	0.00	0.00	50.0
9	R	141	5.7	0.244	11.0	LOS B	9	0.55	0.82	39.6
Approach		**588**	**6.0**	**0.245**	**3.5**	**LOS A**	**9**	**0.16**	**0.26**	**46.1**
King Edward Street										
10	L	149	10.7	0.247	13.5	LOS B	8	0.53	0.97	39.2
11	T	17	11.8	0.548	45.3	LOS E	24	0.92	1.14	24.6
12	R	72	11.1	0.550	45.3	LOS E	24	0.92	1.14	24.6
Approach		**238**	**10.9**	**0.548**	**25.4**	**LOS D**	**24**	**0.67**	**1.03**	**32.1**
All Vehicles		**1485**	**7.3**	**0.550**	**8.1**	**Not Applicable**	**24**	**0.26**	**0.42**	**42.2**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

King Ed_Old Wha Intersection Option 2

2029 AM Peak

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
1	L	98	8.2	0.171	7.3	LOS A	3	0.35	0.59	42.3
2	T	478	7.9	0.258	0.0	LOS A	0	0.00	0.00	50.0
3	R	36	8.3	0.066	10.8	LOS B	2	0.51	0.75	39.8
Approach		**612**	**8.0**	**0.258**	**1.8**	**LOS A**	**3**	**0.09**	**0.14**	**47.9**
Old Wharf Road										
4	L	101	5.0	0.237	13.1	LOS B	5	0.53	0.97	38.9
5	T	44	4.5	0.667	70.0	LOS F	27	0.96	1.17	19.0
6	R	32	6.2	0.667	70.1	LOS F	27	0.96	1.17	19.0
Approach		**177**	**5.1**	**0.671**	**37.6**	**LOS E**	**27**	**0.72**	**1.06**	**26.8**
High Street (N)										
7	L	80	6.2	0.123	6.3	LOS A	2	0.19	0.51	43.0
8	T	405	5.9	0.216	0.0	LOS A	0	0.00	0.00	50.0
9	R	239	5.9	0.495	15.6	LOS C	26	0.69	1.02	36.4
Approach		**724**	**5.9**	**0.494**	**5.9**	**LOS A**	**26**	**0.25**	**0.39**	**43.8**
King Edward Street										
10	L	257	10.9	0.441	16.5	LOS C	23	0.64	1.10	37.3
11	T	28	10.7	1.556	560.7	LOS F	310	1.00	3.30	3.5
12	R	122	10.7	1.525	560.7	LOS F	310	1.00	3.32	3.5
Approach		**407**	**10.8**	**1.526**	**217.1**	**LOS F**	**310**	**0.77**	**1.92**	**8.2**
All Vehicles		**1920**	**7.6**	**1.556**	**52.3**	**Not Applicable**	**310**	**0.35**	**0.70**	**22.3**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

King Ed_Old Wha Intersection Option 2

2019 PM Peak

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
1	L	80	3.8	0.128	6.8	LOS A	2	0.29	0.56	42.6
2	T	353	4.0	0.186	0.0	LOS A	0	0.00	0.00	50.0
3	R	62	3.2	0.117	11.1	LOS B	4	0.54	0.80	39.5
Approach		**495**	**3.8**	**0.186**	**2.5**	**LOS A**	**4**	**0.11**	**0.19**	**47.1**
Old Wharf Road										
4	L	80	1.2	0.185	12.9	LOS B	4	0.53	0.96	39.0
5	T	19	5.0	0.377	38.7	LOS E	13	0.90	1.06	26.5
6	R	40	2.4	0.380	38.8	LOS E	13	0.90	1.07	26.5
Approach		**141**	**2.1**	**0.379**	**24.1**	**LOS C**	**13**	**0.69**	**1.01**	**32.4**
High Street (N)										
7	L	66	3.0	0.100	6.3	LOS A	2	0.15	0.53	43.1
8	T	452	3.1	0.236	0.0	LOS A	0	0.00	0.00	50.0
9	R	182	2.7	0.289	10.5	LOS B	12	0.54	0.81	39.9
Approach		**700**	**3.0**	**0.290**	**3.3**	**LOS A**	**12**	**0.15**	**0.26**	**46.3**
King Edward Street										
10	L	216	5.1	0.323	13.0	LOS B	12	0.52	0.99	39.3
11	T	29	3.4	0.690	53.2	LOS F	31	0.94	1.22	22.4
12	R	83	4.8	0.686	53.2	LOS F	31	0.94	1.22	22.4
Approach		**328**	**4.9**	**0.687**	**26.7**	**LOS D**	**31**	**0.67**	**1.07**	**31.4**
All Vehicles		**1664**	**3.5**	**0.690**	**9.5**	**Not Applicable**	**31**	**0.29**	**0.46**	**41.1**

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Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

King Ed_Old Wha Intersection Option 2

2029 PM Peak

Two-way stop

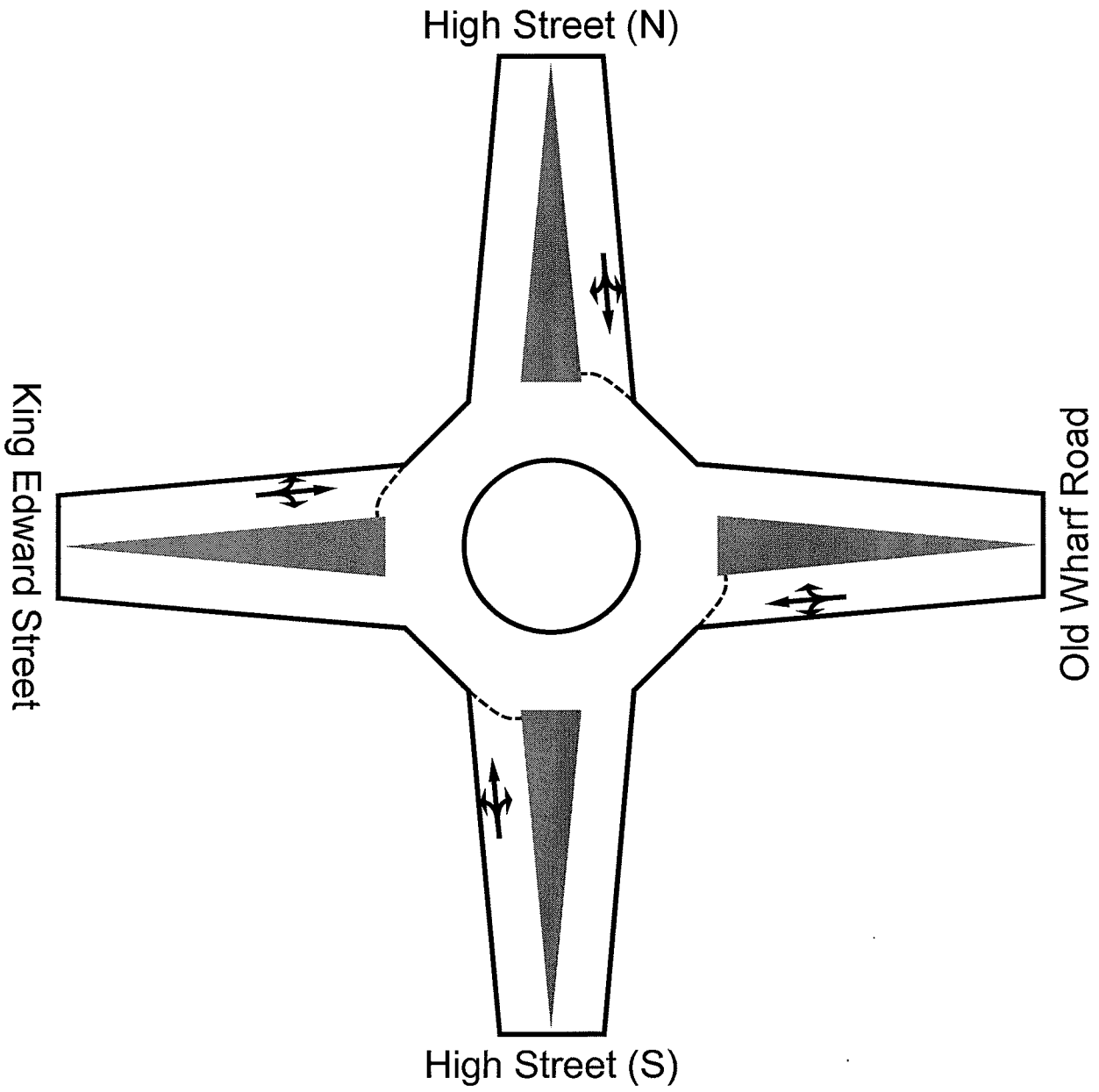
Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
1	L	111	3.6	0.185	7.3	LOS A	4	0.38	0.61	42.2
2	T	392	4.1	0.206	0.0	LOS A	0	0.00	0.00	50.0
3	R	82	3.7	0.205	14.2	LOS B	7	0.66	0.88	37.3
Approach		**584**	**3.9**	**0.206**	**3.4**	**LOS A**	**7**	**0.16**	**0.24**	**46.2**
Old Wharf Road										
4	L	95	1.1	0.247	14.8	LOS B	6	0.60	1.02	37.7
5	T	23	4.2	0.889	141.5	LOS F	42	0.99	1.35	11.5
6	R	47	2.1	0.889	141.5	LOS F	42	0.99	1.35	11.5
Approach		**167**	**1.8**	**0.892**	**69.4**	**LOS F**	**42**	**0.77**	**1.16**	**19.0**
High Street (N)										
7	L	86	3.4	0.133	6.4	LOS A	2	0.18	0.53	43.0
8	T	595	3.0	0.311	0.0	LOS A	0	0.00	0.00	50.0
9	R	278	2.9	0.472	13.0	LOS B	26	0.63	0.97	38.1
Approach		**960**	**3.0**	**0.472**	**4.3**	**LOS A**	**26**	**0.20**	**0.33**	**45.2**
King Edward Street										
10	L	241	5.0	0.370	14.0	LOS B	16	0.57	1.05	38.7
11	T	45	4.4	2.045	1003.8	LOS F	445	1.00	3.73	2.0
12	R	122	4.9	2.033	1003.9	LOS F	445	1.00	3.76	2.0
Approach		**408**	**4.9**	**2.019**	**419.1**	**LOS F**	**445**	**0.74**	**2.16**	**4.6**
All Vehicles		**2119**	**3.5**	**2.045**	**89.1**	**Not Applicable**	**445**	**0.34**	**0.72**	**15.9**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements


High Street (N)
King Edward Street
Old Wharf Road
High Street (S)

SIDRA INTERSECTION

Movement Summary

King Ed_Old Wha Roundabout Option

2009 AM Peak 08:30-09:30

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
1	L	63	7.9	0.364	6.4	LOS A	22	0.36	0.55	42.7
2	T	370	8.1	0.363	4.6	LOS A	22	0.36	0.45	43.9
3	R	27	7.4	0.365	9.9	LOS A	22	0.36	0.62	40.3
Approach		**460**	**8.0**	**0.363**	**5.1**	**LOS A**	**22**	**0.36**	**0.47**	**43.5**
Old Wharf Road										
4	L	67	4.5	0.116	8.5	LOS A	6	0.55	0.68	41.5
5	T	23	4.3	0.116	6.0	LOS A	6	0.55	0.58	42.9
6	R	20	5.0	0.116	11.3	LOS B	6	0.55	0.68	39.7
Approach		**110**	**4.5**	**0.116**	**8.5**	**LOS A**	**6**	**0.55**	**0.66**	**41.5**
High Street (N)										
7	L	48	6.2	0.318	6.2	LOS A	19	0.34	0.54	42.8
8	T	283	6.0	0.317	4.4	LOS A	19	0.34	0.43	44.0
9	R	79	6.2	0.317	9.7	LOS A	19	0.34	0.61	40.4
Approach		**411**	**6.1**	**0.317**	**5.6**	**LOS A**	**19**	**0.34**	**0.48**	**43.1**
King Edward Street										
10	L	133	11.3	0.241	7.9	LOS A	14	0.60	0.68	42.0
11	T	15	13.3	0.242	6.6	LOS A	14	0.60	0.64	42.7
12	R	63	11.1	0.241	11.9	LOS B	14	0.60	0.72	39.4
Approach		**211**	**11.4**	**0.241**	**9.0**	**LOS A**	**14**	**0.60**	**0.69**	**41.2**
All Vehicles		**1192**	**7.6**	**0.365**	**6.3**	**LOS A**	**22**	**0.41**	**0.53**	**42.8**

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Following Degree of Saturation
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* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue

SIDRA INTERSECTION

Movement Summary

King Ed_Old Wha Roundabout Option

2019 AM Peak

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
1	L	95	8.4	0.508	7.1	LOS A	36	0.54	0.61	42.0
2	T	464	8.0	0.508	5.3	LOS A	36	0.54	0.54	43.0
3	R	35	8.6	0.507	10.6	LOS B	36	0.54	0.65	39.8
Approach		**594**	**8.1**	**0.508**	**5.9**	**LOS A**	**36**	**0.54**	**0.56**	**42.6**
Old Wharf Road										
4	L	89	4.5	0.195	10.5	LOS B	11	0.73	0.79	40.0
5	T	31	6.5	0.195	7.9	LOS A	11	0.73	0.73	42.0
6	R	26	3.8	0.195	13.2	LOS B	11	0.73	0.75	38.4
Approach		**146**	**4.8**	**0.195**	**10.4**	**LOS B**	**11**	**0.73**	**0.77**	**40.1**
High Street (N)										
7	L	71	5.7	0.511	6.7	LOS A	39	0.50	0.58	42.1
8	T	438	5.9	0.512	4.9	LOS A	39	0.50	0.50	43.2
9	R	136	5.9	0.513	10.2	LOS B	39	0.50	0.63	39.9
Approach		**644**	**5.9**	**0.513**	**6.2**	**LOS A**	**39**	**0.50**	**0.53**	**42.3**
King Edward Street										
10	L	186	10.8	0.379	9.1	LOS A	24	0.74	0.79	41.2
11	T	20	10.0	0.377	7.8	LOS A	24	0.74	0.76	42.0
12	R	88	11.2	0.379	13.1	LOS B	24	0.74	0.78	38.6
Approach		**295**	**10.8**	**0.379**	**10.2**	**LOS B**	**24**	**0.74**	**0.79**	**40.4**
All Vehicles		**1679**	**7.4**	**0.513**	**7.2**	**LOS A**	**39**	**0.58**	**0.61**	**41.9**

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* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue

SIDRA INTERSECTION

Movement Summary

King Ed_Old Wha Roundabout Option

2029 AM Peak

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
1	L	99	8.1	0.697	10.3	LOS B	73	0.82	0.84	40.2
2	T	574	8.0	0.697	8.5	LOS A	73	0.82	0.81	41.6
3	R	42	7.1	0.700	13.8	LOS B	73	0.82	0.82	38.1
Approach		**715**	**8.0**	**0.697**	**9.1**	**LOS A**	**73**	**0.82**	**0.81**	**41.1**
Old Wharf Road										
4	L	101	5.0	0.311	12.9	LOS B	20	0.89	0.91	38.2
5	T	44	4.5	0.312	10.3	LOS B	20	0.89	0.88	40.1
6	R	32	6.2	0.311	15.6	LOS B	20	0.89	0.82	36.9
Approach		**177**	**5.1**	**0.311**	**12.7**	**LOS B**	**20**	**0.89**	**0.88**	**38.4**
High Street (N)										
7	L	81	6.2	0.686	7.7	LOS A	66	0.73	0.66	41.3
8	T	495	6.1	0.685	5.9	LOS A	66	0.73	0.61	42.0
9	R	236	5.9	0.684	11.1	LOS B	66	0.73	0.67	39.2
Approach		**812**	**6.0**	**0.685**	**7.6**	**LOS A**	**66**	**0.73**	**0.63**	**41.1**
King Edward Street										
10	L	254	11.0	0.624	14.5	LOS B	58	0.95	1.09	37.2
11	T	27	11.1	0.628	13.2	LOS B	58	0.95	1.09	38.1
12	R	121	10.7	0.624	18.5	LOS B	58	0.95	1.00	35.2
Approach		**402**	**10.9**	**0.624**	**15.6**	**LOS B**	**58**	**0.95**	**1.06**	**36.6**
All Vehicles		**2106**	**7.5**	**0.700**	**10.1**	**LOS B**	**73**	**0.81**	**0.80**	**39.9**

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Following LOS
- Based on density for continuous movements

Following Queue

SIDRA INTERSECTION

Movement Summary

King Ed_Old Wha Roundabout Option

2009 PM Peak 16:30-17:30

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
1	L	64	4.7	0.317	6.4	LOS A	18	0.40	0.56	42.6
2	T	278	4.0	0.317	4.7	LOS A	18	0.40	0.47	43.7
3	R	49	4.1	0.316	9.9	LOS A	18	0.40	0.63	40.2
Approach		**391**	**4.1**	**0.317**	**5.6**	**LOS A**	**18**	**0.40**	**0.50**	**43.0**
Old Wharf Road										
4	L	56	1.8	0.113	8.9	LOS A	6	0.60	0.70	41.2
5	T	14	7.1	0.113	6.4	LOS A	6	0.60	0.62	42.7
6	R	28	3.4	0.113	11.7	LOS B	6	0.60	0.69	39.5
Approach		**100**	**3.0**	**0.113**	**9.4**	**LOS A**	**6**	**0.60**	**0.69**	**40.8**
High Street (N)										
7	L	48	2.1	0.382	6.3	LOS A	24	0.40	0.55	42.6
8	T	326	3.1	0.383	4.6	LOS A	24	0.40	0.46	43.7
9	R	118	3.4	0.383	9.8	LOS A	24	0.40	0.62	40.2
Approach		**491**	**3.1**	**0.383**	**6.0**	**LOS A**	**24**	**0.40**	**0.51**	**42.7**
King Edward Street										
10	L	167	4.8	0.253	7.1	LOS A	14	0.55	0.64	42.2
11	T	23	4.3	0.253	5.8	LOS A	14	0.55	0.59	42.9
12	R	65	4.7	0.253	11.1	LOS B	14	0.55	0.69	39.7
Approach		**253**	**4.7**	**0.252**	**8.0**	**LOS A**	**14**	**0.55**	**0.65**	**41.6**
All Vehicles		**1235**	**3.7**	**0.383**	**6.6**	**LOS A**	**24**	**0.44**	**0.55**	**42.4**

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* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue

SIDRA INTERSECTION

Movement Summary

King Ed_Old Wha Roundabout Option

2019 PM Peak

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
1	L	93	4.3	0.511	7.4	LOS A	36	0.62	0.66	41.7
2	T	404	4.0	0.511	5.6	LOS A	36	0.62	0.59	42.6
3	R	72	4.2	0.511	10.9	LOS B	36	0.62	0.69	39.5
Approach		**569**	**4.0**	**0.511**	**6.6**	**LOS A**	**36**	**0.62**	**0.61**	**42.0**
Old Wharf Road										
4	L	80	1.2	0.227	11.7	LOS B	14	0.83	0.85	39.0
5	T	19	5.0	0.227	9.2	LOS A	14	0.83	0.82	40.9
6	R	40	2.4	0.227	14.5	LOS B	14	0.83	0.78	37.6
Approach		**141**	**2.1**	**0.226**	**12.2**	**LOS B**	**14**	**0.83**	**0.83**	**38.8**
High Street (N)										
7	L	74	2.7	0.652	7.5	LOS A	55	0.69	0.66	41.4
8	T	497	3.0	0.651	5.8	LOS A	55	0.69	0.61	42.2
9	R	200	3.0	0.651	11.0	LOS B	55	0.69	0.68	39.3
Approach		**770**	**3.0**	**0.651**	**7.3**	**LOS A**	**55**	**0.69**	**0.63**	**41.3**
King Edward Street										
10	L	281	5.0	0.504	9.5	LOS A	37	0.79	0.85	40.8
11	T	39	5.1	0.506	8.2	LOS A	37	0.79	0.82	41.7
12	R	108	4.6	0.502	13.5	LOS B	37	0.79	0.83	38.3
Approach		**428**	**4.9**	**0.503**	**10.4**	**LOS B**	**37**	**0.79**	**0.84**	**40.2**
All Vehicles		**1908**	**3.7**	**0.652**	**8.1**	**LOS A**	**55**	**0.70**	**0.69**	**41.1**

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Following LOS
- Based on density for continuous movements

Following Queue

SIDRA INTERSECTION

Movement Summary

King Ed_Old Wha Roundabout Option

2029 PM Peak

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
High Street (S)										
1	L	112	3.6	0.689	10.5	LOS B	70	0.86	0.87	39.9
2	T	486	3.9	0.688	8.7	LOS A	70	0.86	0.85	41.4
3	R	85	3.5	0.685	14.0	LOS B	70	0.86	0.84	37.9
Approach		**682**	**3.8**	**0.688**	**9.7**	**LOS A**	**70**	**0.86**	**0.85**	**40.6**
Old Wharf Road										
4	L	95	1.1	0.419	17.1	LOS B	30	1.00	1.04	35.4
5	T	23	4.2	0.421	14.6	LOS B	30	1.00	1.04	37.0
6	R	47	2.1	0.421	19.8	LOS B	30	1.00	0.89	34.4
Approach		**167**	**1.8**	**0.419**	**17.5**	**LOS B**	**30**	**1.00**	**1.00**	**35.3**
High Street (N)										
7	L	88	3.4	0.873	13.9	LOS B	147	1.00	0.96	37.5
8	T	613	2.9	0.872	12.1	LOS B	147	1.00	0.96	38.7
9	R	286	3.1	0.872	17.4	LOS B	147	1.00	0.92	35.8
Approach		**988**	**3.0**	**0.872**	**13.8**	**LOS B**	**147**	**1.00**	**0.95**	**37.7**
King Edward Street										
10	L	340	5.0	0.707	15.1	LOS B	74	0.98	1.13	36.7
11	T	46	4.3	0.708	13.9	LOS B	74	0.98	1.13	37.5
12	R	132	5.3	0.706	19.1	LOS B	74	0.98	1.05	34.8
Approach		**518**	**5.0**	**0.707**	**16.0**	**LOS B**	**74**	**0.98**	**1.11**	**36.2**
All Vehicles		**2355**	**3.6**	**0.873**	**13.4**	**LOS B**	**147**	**0.96**	**0.96**	**38.0**

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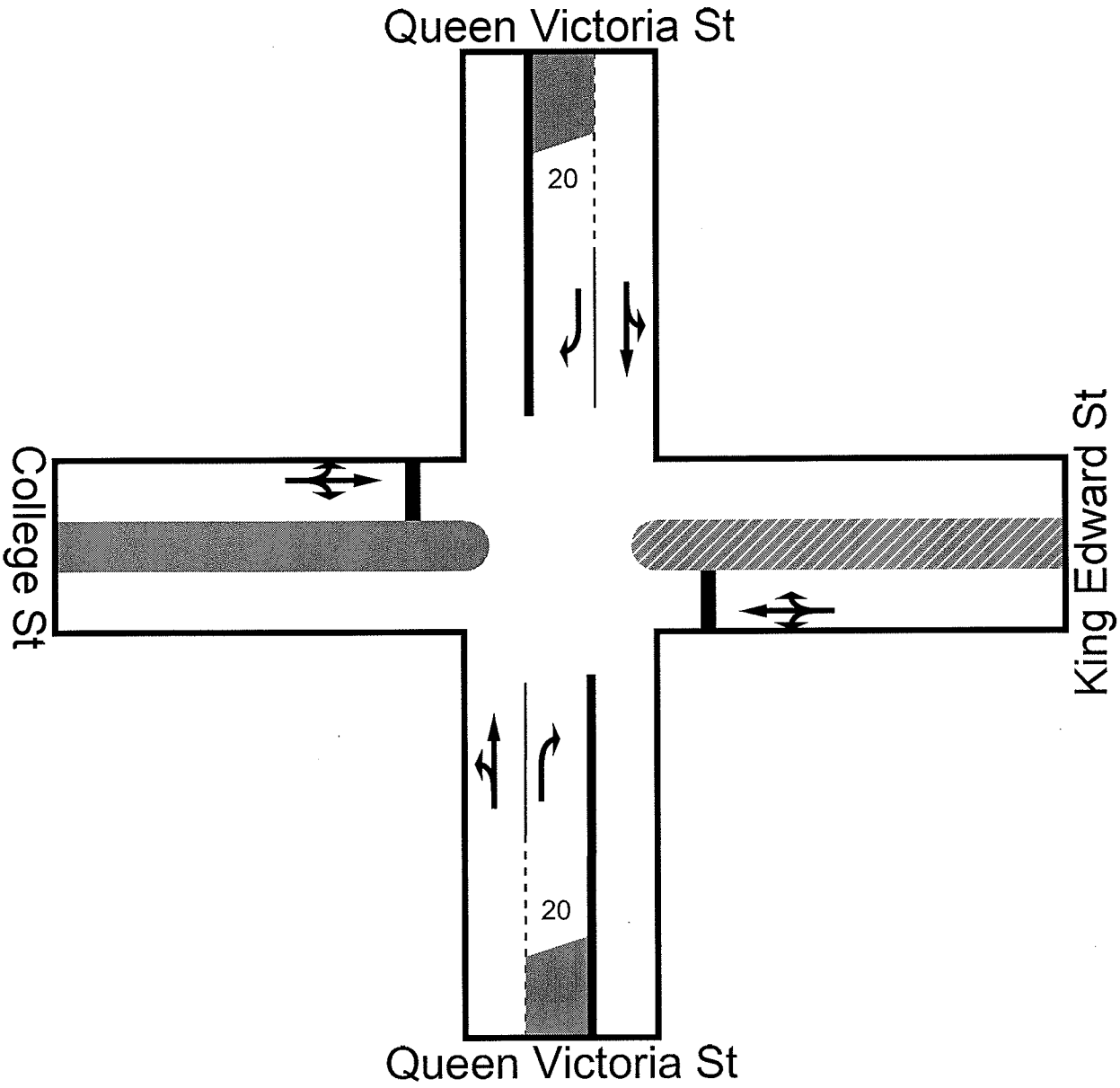
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue


Queen Victoria St
20
College St
King Edward St
20
Queen Victoria St

SIDRA INTERSECTION

Movement Summary

King Edward_College Intersection DM

2009 AM Peak 07:45 - 08:45

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Queen Victoria St										
1	L	9	11.1	0.069	6.2	LOS A	4	0.10	0.53	43.3
2	T	119	4.2	0.069	0.1	LOS A	4	0.10	0.00	49.0
3	R	61	3.3	0.087	7.2	LOS A	2	0.17	0.60	42.5
Approach		**188**	**4.3**	**0.087**	**2.6**	**LOS A**	**4**	**0.13**	**0.22**	**46.5**
King Edward St										
4	L	65	13.8	0.198	12.1	LOS B	8	0.34	0.84	39.7
5	T	53	13.2	0.198	12.0	LOS B	8	0.34	0.95	39.8
6	R	34	14.7	0.198	12.1	LOS B	8	0.34	0.93	39.7
Approach		**152**	**13.8**	**0.197**	**12.1**	**LOS B**	**8**	**0.34**	**0.90**	**39.8**
Queen Victoria St										
7	L	32	9.4	0.089	6.9	LOS A	3	0.16	0.57	42.7
8	T	69	8.6	0.089	0.3	LOS A	3	0.16	0.04	48.6
9	R	23	8.3	0.038	7.6	LOS A	1	0.24	0.60	42.3
Approach		**126**	**8.7**	**0.089**	**3.4**	**LOS A**	**3**	**0.17**	**0.28**	**45.7**
College St										
10	L	40	10.0	0.141	11.9	LOS B	5	0.38	0.83	39.8
11	T	46	10.9	0.141	11.8	LOS B	5	0.38	0.93	39.9
12	R	22	9.1	0.141	11.9	LOS B	5	0.38	0.91	39.8
Approach		**108**	**10.2**	**0.141**	**11.8**	**LOS B**	**5**	**0.38**	**0.89**	**39.8**
All Vehicles		**574**	**8.9**	**0.198**	**7.0**	**Not Applicable**	**8**	**0.24**	**0.54**	**43.0**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

King Edward_College Intersection DM

2019 AM Peak

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Queen Victoria St										
1	L	13	7.7	0.094	6.3	LOS A	5	0.15	0.53	43.1
2	T	161	3.7	0.094	0.2	LOS A	5	0.15	0.00	48.6
3	R	103	3.9	0.151	7.3	LOS A	4	0.21	0.61	42.4
Approach		**277**	**4.0**	**0.151**	**3.1**	**LOS A**	**5**	**0.17**	**0.25**	**45.8**
King Edward St										
4	L	105	14.2	0.331	13.9	LOS B	16	0.44	0.86	38.6
5	T	71	14.1	0.332	13.7	LOS B	16	0.44	1.02	38.7
6	R	45	13.3	0.331	13.8	LOS B	16	0.44	1.00	38.6
Approach		**222**	**14.0**	**0.331**	**13.8**	**LOS B**	**16**	**0.44**	**0.94**	**38.6**
Queen Victoria St										
7	L	48	8.2	0.126	7.1	LOS A	5	0.22	0.58	42.5
8	T	92	7.7	0.126	0.5	LOS A	5	0.22	0.07	48.0
9	R	44	8.9	0.072	7.9	LOS A	2	0.29	0.63	42.1
Approach		**185**	**8.1**	**0.126**	**4.1**	**LOS A**	**5**	**0.24**	**0.34**	**44.9**
College St										
10	L	35	8.8	0.230	13.8	LOS B	9	0.51	0.83	38.6
11	T	74	9.6	0.230	13.7	LOS B	9	0.51	0.99	38.7
12	R	32	9.7	0.230	13.8	LOS B	9	0.51	0.94	38.6
Approach		**138**	**9.4**	**0.230**	**13.8**	**LOS B**	**9**	**0.51**	**0.94**	**38.6**
All Vehicles		**822**	**8.5**	**0.332**	**8.0**	**Not Applicable**	**16**	**0.32**	**0.57**	**42.2**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

King Edward_College Intersection DM

2029 AM Peak

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Queen Victoria St										
1	L	12	8.3	0.088	6.4	LOS A	5	0.19	0.53	42.9
2	T	149	4.0	0.088	0.3	LOS A	5	0.19	0.00	48.3
3	R	97	4.1	0.145	7.7	LOS A	4	0.27	0.63	42.2
Approach		**258**	**4.3**	**0.145**	**3.3**	**LOS A**	**5**	**0.22**	**0.26**	**45.5**
King Edward St										
4	L	143	14.0	0.507	17.2	LOS C	34	0.58	1.03	36.5
5	T	97	14.4	0.508	17.1	LOS C	34	0.58	1.12	36.6
6	R	62	14.5	0.508	17.2	LOS C	34	0.58	1.11	36.5
Approach		**302**	**14.2**	**0.507**	**17.2**	**LOS C**	**34**	**0.58**	**1.08**	**36.5**
Queen Victoria St										
7	L	74	8.1	0.190	7.2	LOS A	8	0.23	0.58	42.5
8	T	139	7.9	0.190	0.5	LOS A	8	0.23	0.07	47.9
9	R	68	7.4	0.106	7.9	LOS A	3	0.28	0.63	42.2
Approach		**281**	**7.8**	**0.190**	**4.0**	**LOS A**	**8**	**0.24**	**0.34**	**44.9**
College St										
10	L	42	9.5	0.318	15.7	LOS C	14	0.56	0.89	37.3
11	T	88	10.1	0.317	15.6	LOS C	14	0.56	1.04	37.4
12	R	38	10.5	0.317	15.7	LOS C	14	0.56	1.01	37.3
Approach		**169**	**10.1**	**0.317**	**15.6**	**LOS C**	**14**	**0.56**	**0.99**	**37.4**
All Vehicles		**1010**	**9.2**	**0.508**	**9.7**	**Not Applicable**	**34**	**0.39**	**0.65**	**40.9**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

King Edward_College Intersection DM

2009 PM Peak 16:30-17:30

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Queen Victoria St										
1	L	10	9.1	0.067	6.2	LOS A	3	0.11	0.53	43.3
2	T	113	2.7	0.067	0.1	LOS A	3	0.11	0.00	49.0
3	R	70	2.9	0.102	7.2	LOS A	2	0.19	0.61	42.4
Approach		**193**	**3.1**	**0.102**	**3.0**	**LOS A**	**3**	**0.14**	**0.25**	**46.0**
King Edward St										
4	L	87	3.4	0.230	11.4	LOS B	9	0.33	0.84	39.8
5	T	83	2.4	0.230	11.2	LOS B	9	0.33	0.95	40.0
6	R	25	3.8	0.230	11.4	LOS B	9	0.33	0.95	39.8
Approach		**196**	**3.1**	**0.230**	**11.3**	**LOS B**	**9**	**0.33**	**0.90**	**39.9**
Queen Victoria St										
7	L	41	4.9	0.108	6.9	LOS A	4	0.17	0.57	42.7
8	T	86	4.7	0.108	0.3	LOS A	4	0.17	0.04	48.4
9	R	30	3.4	0.043	7.4	LOS A	1	0.23	0.60	42.3
Approach		**156**	**4.5**	**0.108**	**3.4**	**LOS A**	**4**	**0.18**	**0.29**	**45.6**
College St										
10	L	45	4.4	0.148	11.6	LOS B	6	0.37	0.83	39.8
11	T	66	4.6	0.148	11.5	LOS B	6	0.37	0.94	39.9
12	R	7	12.5	0.148	11.6	LOS B	6	0.37	0.93	39.8
Approach		**118**	**5.1**	**0.148**	**11.5**	**LOS B**	**6**	**0.37**	**0.90**	**39.9**
All Vehicles		**663**	**3.8**	**0.230**	**7.1**	**Not Applicable**	**9**	**0.25**	**0.57**	**42.8**

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Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

King Edward_College Intersection DM

2019 PM Peak

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Queen Victoria St										
1	L	14	7.1	0.090	6.2	LOS A	5	0.15	0.53	43.1
2	T	153	3.3	0.091	0.2	LOS A	5	0.15	0.00	48.6
3	R	95	3.2	0.142	7.6	LOS A	3	0.26	0.63	42.2
Approach		**262**	**3.4**	**0.142**	**3.2**	**LOS A**	**5**	**0.19**	**0.26**	**45.8**
King Edward St										
4	L	125	3.2	0.395	13.8	LOS B	20	0.49	0.91	38.3
5	T	119	3.4	0.395	13.7	LOS B	20	0.49	1.05	38.4
6	R	36	2.8	0.396	13.8	LOS B	20	0.49	1.04	38.3
Approach		**281**	**3.2**	**0.395**	**13.8**	**LOS B**	**20**	**0.49**	**0.98**	**38.3**
Queen Victoria St										
7	L	67	4.5	0.181	7.0	LOS A	7	0.22	0.58	42.5
8	T	141	5.0	0.181	0.5	LOS A	7	0.22	0.06	48.0
9	R	48	4.2	0.073	7.7	LOS A	2	0.28	0.62	42.2
Approach		**256**	**4.7**	**0.181**	**3.6**	**LOS A**	**7**	**0.23**	**0.30**	**45.3**
College St										
10	L	59	5.1	0.236	13.2	LOS B	9	0.47	0.83	38.8
11	T	86	4.7	0.236	13.0	LOS B	9	0.47	1.00	38.9
12	R	9	10.0	0.238	13.2	LOS B	9	0.47	0.98	38.8
Approach		**155**	**5.2**	**0.236**	**13.1**	**LOS B**	**9**	**0.47**	**0.93**	**38.8**
All Vehicles		**954**	**4.0**	**0.396**	**8.0**	**Not Applicable**	**20**	**0.33**	**0.59**	**42.0**

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* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

King Edward_College Intersection DM

2029 PM Peak

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Queen Victoria St										
1	L	18	5.6	0.112	6.3	LOS A	6	0.17	0.53	43.0
2	T	189	3.2	0.113	0.2	LOS A	6	0.17	0.00	48.5
3	R	118	3.4	0.178	7.8	LOS A	5	0.29	0.64	42.1
Approach		**326**	**3.4**	**0.178**	**3.3**	**LOS A**	**6**	**0.21**	**0.26**	**45.7**
King Edward St										
4	L	164	3.0	0.582	17.6	LOS C	41	0.59	1.09	36.0
5	T	156	3.2	0.582	17.4	LOS C	41	0.59	1.16	36.0
6	R	47	2.1	0.580	17.5	LOS C	41	0.59	1.15	35.9
Approach		**367**	**3.0**	**0.582**	**17.5**	**LOS C**	**41**	**0.59**	**1.13**	**36.0**
Queen Victoria St										
7	L	78	5.1	0.214	7.2	LOS A	9	0.26	0.59	42.4
8	T	162	4.9	0.214	0.6	LOS A	9	0.26	0.08	47.7
9	R	56	5.4	0.087	8.0	LOS A	2	0.32	0.64	42.0
Approach		**296**	**5.1**	**0.214**	**3.8**	**LOS A**	**9**	**0.27**	**0.32**	**45.0**
College St										
10	L	72	5.6	0.324	15.1	LOS C	14	0.55	0.90	37.6
11	T	104	4.8	0.324	14.9	LOS B	14	0.55	1.04	37.7
12	R	11	9.1	0.324	15.1	LOS C	14	0.55	1.03	37.6
Approach		**187**	**5.3**	**0.324**	**15.0**	**LOS C**	**14**	**0.55**	**0.98**	**37.6**
All Vehicles		**1176**	**4.0**	**0.582**	**9.7**	**Not Applicable**	**41**	**0.40**	**0.66**	**40.7**

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x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

King Edward_College Intersection Option 2

2019 AM Peak

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Queen Victoria St										
1	L	15	6.7	0.153	6.3	LOS A	9	0.17	0.53	43.0
2	T	269	4.1	0.153	0.2	LOS A	9	0.17	0.00	48.5
3	R	80	3.8	0.120	7.7	LOS A	3	0.27	0.63	42.2
Approach		**365**	**4.1**	**0.153**	**2.1**	**LOS A**	**9**	**0.19**	**0.16**	**46.7**
King Edward St										
4	L	106	14.2	0.397	16.4	LOS C	22	0.54	0.95	37.0
5	T	72	13.9	0.398	16.2	LOS C	22	0.54	1.06	37.1
6	R	46	13.0	0.397	16.4	LOS C	22	0.54	1.06	37.0
Approach		**224**	**13.8**	**0.398**	**16.3**	**LOS C**	**22**	**0.54**	**1.01**	**37.0**
Queen Victoria St										
7	L	48	8.2	0.176	7.1	LOS A	7	0.20	0.58	42.6
8	T	146	8.2	0.175	0.4	LOS A	7	0.20	0.06	48.2
9	R	48	8.2	0.082	8.9	LOS A	2	0.39	0.68	41.4
Approach		**245**	**8.2**	**0.175**	**3.4**	**LOS A**	**7**	**0.24**	**0.29**	**45.5**
College St										
10	L	74	9.6	0.239	14.4	LOS B	9	0.55	0.88	38.2
11	T	36	11.1	0.240	14.2	LOS B	9	0.55	1.00	38.3
12	R	32	9.7	0.240	14.4	LOS B	9	0.55	0.99	38.2
Approach		**140**	**10.0**	**0.240**	**14.3**	**LOS B**	**9**	**0.55**	**0.94**	**38.3**
All Vehicles		**974**	**8.2**	**0.398**	**7.5**	**Not Applicable**	**22**	**0.33**	**0.50**	**42.5**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

King Edward_College Intersection Option 2

2029 AM Peak

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Queen Victoria St										
1	L	16	6.2	0.114	6.4	LOS A	6	0.21	0.54	42.9
2	T	194	4.1	0.114	0.3	LOS A	6	0.21	0.00	48.1
3	R	125	4.0	0.196	8.5	LOS A	5	0.38	0.69	41.6
Approach		**335**	**4.2**	**0.196**	**3.7**	**LOS A**	**6**	**0.27**	**0.28**	**45.2**
King Edward St										
4	L	146	13.7	0.658	23.7	LOS C	51	0.71	1.30	32.9
5	T	99	14.1	0.660	23.6	LOS C	51	0.71	1.26	32.9
6	R	63	14.3	0.656	23.7	LOS C	51	0.71	1.25	32.9
Approach		**308**	**14.0**	**0.659**	**23.7**	**LOS C**	**51**	**0.71**	**1.28**	**32.9**
Queen Victoria St										
7	L	80	7.5	0.299	7.4	LOS A	13	0.30	0.60	42.2
8	T	239	7.9	0.298	0.8	LOS A	13	0.30	0.10	47.4
9	R	80	7.5	0.128	8.3	LOS A	3	0.33	0.65	41.9
Approach		**399**	**7.8**	**0.299**	**3.6**	**LOS A**	**13**	**0.30**	**0.31**	**45.1**
College St										
10	L	86	10.3	0.336	16.6	LOS C	15	0.57	0.93	36.7
11	T	52	9.8	0.336	16.5	LOS C	15	0.57	1.04	36.8
12	R	35	8.8	0.337	16.6	LOS C	15	0.57	1.04	36.7
Approach		**172**	**9.9**	**0.336**	**16.6**	**LOS C**	**15**	**0.57**	**0.99**	**36.8**
All Vehicles		**1214**	**8.6**	**0.660**	**10.6**	**Not Applicable**	**51**	**0.44**	**0.64**	**40.1**

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Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

King Edward_College Intersection Option 2

2019 PM Peak

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Queen Victoria St										
1	L	16	6.3	0.128	6.3	LOS A	7	0.17	0.53	43.1
2	T	221	3.2	0.128	0.2	LOS A	7	0.17	0.00	48.5
3	R	59	3.4	0.089	7.7	LOS A	2	0.27	0.62	42.2
Approach		**296**	**3.4**	**0.127**	**2.0**	**LOS A**	**7**	**0.19**	**0.15**	**46.8**
King Edward St										
4	L	115	2.6	0.375	14.1	LOS B	18	0.51	0.91	38.2
5	T	108	2.8	0.375	13.9	LOS B	18	0.51	1.04	38.3
6	R	33	3.0	0.375	14.0	LOS B	18	0.51	1.03	38.2
Approach		**255**	**2.7**	**0.375**	**14.0**	**LOS B**	**18**	**0.51**	**0.98**	**38.2**
Queen Victoria St										
7	L	52	5.8	0.175	6.8	LOS A	7	0.17	0.57	42.7
8	T	154	5.2	0.175	0.3	LOS A	7	0.17	0.04	48.5
9	R	52	5.8	0.083	8.3	LOS A	2	0.35	0.65	41.8
Approach		**258**	**5.4**	**0.175**	**3.2**	**LOS A**	**7**	**0.20**	**0.27**	**45.7**
College St										
10	L	78	5.1	0.234	13.2	LOS B	9	0.50	0.86	38.8
11	T	46	4.3	0.234	13.1	LOS B	9	0.50	1.00	38.9
12	R	32	6.2	0.234	13.2	LOS B	9	0.50	0.98	38.8
Approach		**156**	**5.1**	**0.234**	**13.2**	**LOS B**	**9**	**0.50**	**0.92**	**38.8**
All Vehicles		**965**	**4.0**	**0.375**	**7.3**	**Not Applicable**	**18**	**0.33**	**0.53**	**42.6**

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Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

SIDRA INTERSECTION

Movement Summary

King Edward_College Intersection Option 2

2029 PM Peak

Two-way stop

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Queen Victoria St										
1	L	22	4.5	0.179	6.3	LOS A	10	0.19	0.53	43.0
2	T	312	2.9	0.179	0.3	LOS A	10	0.19	0.00	48.3
3	R	83	2.4	0.133	8.8	LOS A	4	0.40	0.70	41.3
Approach		**416**	**2.9**	**0.179**	**2.3**	**LOS A**	**10**	**0.23**	**0.17**	**46.4**
King Edward St										
4	L	162	3.1	0.771	27.5	LOS D	65	0.77	1.54	30.8
5	T	154	3.2	0.770	27.4	LOS D	65	0.77	1.41	30.9
6	R	47	2.1	0.770	27.5	LOS D	65	0.77	1.41	30.8
Approach		**363**	**3.0**	**0.771**	**27.5**	**LOS D**	**65**	**0.77**	**1.47**	**30.8**
Queen Victoria St										
7	L	77	5.2	0.324	7.1	LOS A	15	0.24	0.58	42.4
8	T	292	5.1	0.324	0.5	LOS A	15	0.24	0.07	47.9
9	R	60	5.0	0.099	9.1	LOS A	3	0.42	0.71	41.1
Approach		**429**	**5.1**	**0.324**	**2.9**	**LOS A**	**15**	**0.26**	**0.25**	**45.8**
College St										
10	L	95	5.3	0.411	18.7	LOS C	19	0.64	1.04	35.4
11	T	57	5.3	0.413	18.6	LOS C	19	0.64	1.08	35.4
12	R	38	5.3	0.413	18.7	LOS C	19	0.64	1.08	35.4
Approach		**190**	**5.3**	**0.412**	**18.7**	**LOS C**	**19**	**0.64**	**1.06**	**35.4**
All Vehicles		**1398**	**3.9**	**0.771**	**11.2**	**Not Applicable**	**65**	**0.44**	**0.65**	**39.4**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Appendix G – Consultation Document and Responses

NZ TRANSPORT AGENCY
WAKA KOTAHI

tasman lifestyle district council

REPORT

Consultation Document
Motueka Transportation Study

Prepared for NZ Transport Agency and Tasman District Council

OCTOBER 2009

MWH
BUILDING A BETTER WORLD

1 Introduction

Tasman District Council and the NZ Transport Agency have engaged MWH New Zealand to investigate short to medium term options for improving the safety and efficiency of vehicles and pedestrians along SH60 High Street and particularly through the Motueka Town Centre.

The competing uses of High Street as both a through route and a town centre have resulted in a road that serves neither function particularly well. This issue will be further exacerbated in the future with increasing demand for transport and, in particular, the proposed development to the west of High Street. Accordingly, this study focuses on measures that can be undertaken to improve both the town centre environment and the flow of traffic through Motueka.

This consultation document requests feedback to assist in making decisions about which short to medium term options for Motueka should be further investigated. Wider consultation with the community at large will be undertaken once these further investigations have been completed but before any decisions are made in terms of a preferred package of work. Consultation will continue throughout the projects' development and implementation to ensure the community has their say at all stages.

2 Key Issues

A number of key issues have been identified through a review of historic reports, recent data collection and a site visit by the project team. These include:

- Pedestrians and Cyclists on SH60
    - The location and number of pedestrian crossings are not ideal as pedestrians are choosing not to use the formal facilities. There is also an apparent demand around The Warehouse.
    - There have been a number of reported pedestrian crashes, particularly at the Pah Street intersection with High Street.
    - Pedestrian provisions at intersections are not consistent around the town centre.
    - Need to ensure good pedestrian and cycle connectivity between the existing town centre and the future development proposed between Whakarewa Street and King Edward Street.
    - Lack of on-road cycle provisions.

- Traffic Capacity
    - While congestion is common during the two week Christmas and New Years period, it is not economic to design for such a short period of time. Nevertheless, the traffic volumes of the entire summer period do result in significant delays on High Street and these do need to be addressed.
    - The capacity of High Street is restricted by existing priority intersection designs, pedestrian movements and on-street parking provisions.
    - There is concern about whether the priority controlled intersections adequately cater for side road traffic during peak morning and evening hours particularly during the peak months.
    - The additional traffic that would be generated by the proposed residential and commercial plan changes to the west of Motueka would place additional demand on the network.

- Routes through Motukea
    - SH60 is seen to sever the town centre and the competing use of High Street for through traffic and local traffic affects efficiency and vitality
    - On-street parking on SH60 may exacerbate the interference between through and local traffic.
    - There is a limited number of routes through Motueka and lack of efficient alternative routes around the town centre.

- Due to the current legislative and funding environment, a full bypass of Motueka including a new bridge over the Motueka River is not likely to be progressed within the next 10-20 years. Accordingly there is a need to focus on what can be undertaken before such a bypass is constructed.

3 Improvement Options

In order to address some of the issues raised above, possible improvement options have been identified. These fall into two main categories:

- Local improvements on SH60 and within the town centre; and
- Short to medium term alternative through route options.

Any or all of the local improvements could be implemented with or without an alternative through route being provided.

3.1 Local Improvements

Local improvements, which focus on Motueka High Street (SH60), aim to improve the flow of traffic and improve the safety of pedestrians and cyclists. The improvements identified so far and shown on Figure 1 are described below:

1. Installation of a roundabout at the intersection of King Edward Street and Old Wharf Road with High Street. The roundabout would reduce the crash rate and reduce delay for side road and all turning traffic. This would consist of single approach and circulating lanes.
2. Installation of a roundabout at the intersection of Whakarewa Street and High Street.

   This could be implemented with the restriction of turning movements into the New World and Hickmott Carpark to 'in' only from High Street. The exit would be via Woodland Avenue, onto the proposed roundabout, or Tudor Street. The entry could be further restricted to left-in only, which would reduce the number of vehicle movement conflicts on High Street. Restriction of the turning movements at the High Street entrance to The Warehouse could also be considered by creating an exit onto Naumai Street.
3. Narrow the entrance or install a median island on Tudor Street to encourage turning vehicles to slow down. This will improve the provision for pedestrians across Tudor Street and would include removing the kerb build-out on High Street to allow marking of a right turn bay into Tudor Street.
4. Relocation of the three zebra crossings on High Street closer to pedestrian desire lines and away from intersection conflicts with turning vehicles. One or all of the zebra crossings could be replaced by signalised pedestrian crossings in the future.
5. Marking of parallel parking bays on both sides of High Street between Whakarewa Street and Poole Street. This is to formalise the parking zone, and would retain the existing parking duration of P60 and P10.
6. Narrow the entrance or install a median island on Wallace Street to encourage turning vehicles to slow down. This would improve the pedestrian provisions across Wallace Street.
7. Provide kerb build-outs to cater for the existing cycle stands to help promote cycling by provision of a safe location for cycle parking. The existing cycle stands are positioned so that cycles are on the High Street parking shoulder where they could possibly be struck by vehicles.
8. Installation of traffic signals at the intersection with Pah Street and Greenwood Street. This will include facilities for pedestrians to cross.
9. Improving signage of off street car parking facilities to encourage use of these facilities. This could reduce the demand on the on-street car parks and possibly reduce the delays that parking vehicles impose on through traffic.

10. Create parking areas on the west of the High Street in the town centre to help manage traffic flows at intersections.

All the above improvements would have localised benefits such as reductions in side road delays, improving the town centre environment and improving the facilities for pedestrians and cyclists. However, none of the above options on their own would significantly improve the traffic flow on High Street, especially during the summer period. One option that would improve traffic flows on SH60 is to remove on-street car parking on one or both sides of the street. However, this option was not pursued further due to the adverse effects it is likely to have on businesses, pedestrians and traffic safety.

3.2 Short to Medium Alternative Through Route Options

While a bypass involving a new bridge is likely to be some years away, some short term alternative through route options predominantly utilising the existing road network were investigated to determine their potential to attract traffic, their costs and the adverse impacts they may have. The four alternative through route alignments identified are shown in Figure 2 and are summarised below. All would require roading improvements, specifically at intersections, to encourage use of the alternative through route.

Option 1: Thorp Street between Staples Street and Old Wharf Road

Option 2: Queen Victoria Street. Alternative northern and southern connections exist for this option. At the southern end, the alternative through route could tie into SH60 either via King Edward Street or by providing a new link from Wildman Road to SH60. At the northern end, the tie in could be via the existing road network into Pah Street (although this is the busiest intersection in Motueka) or via a new link into Parker Street or alternatively via a new route traversing the base of the stopbanks which connects to SH60 north of Staples Street.

Option 3: Saxon Street, Vosper Street and Wilkinson Street, between Fearon Street and Tudor Street.

Option 4: Talbot Street and Manoy Street between Poole Street and Whakarewa Street. This would involve new road construction to complete this link.

Option 5: Options 1, 2 and/or 3 could be signed as temporary alternative through routes over the peak holiday period to reduce the impact on the Motueka Town Centre. This option would not involve any new roading works.

The advantages and disadvantages of each option are presented in Table 3-1.

Table 3-1 : Advantages and Disadvantages of each Option

Option	Works Required	Advantages	Disadvantages
Option 1 Thorp Street	• Carriageway widening and strengthening • Bend easing • SH 60 Intersection improvements	• Route already in place	• Conflicts with adjacent residential land use • May only be attractive for southbound traffic
Option 2 Queen Victoria Street	• Significant road construction for longer options • SH60 Intersection improvements	• Possible staged implementation • Adjacent land use mostly semi-rural • Route mostly in place	• Pah Street option enters centre of Motueka • Requires land purchase • High cost of longer options • Significantly longer route may not attract high volumes of traffic
Option 3 Saxon/ Vosper/ Wilkinson	• Carriageway strengthening • SH60 Intersection improvements	• Route already in place	• Conflicts with adjacent residential land use • Narrow local intersections including a 'dog-leg'
Option 4 Talbot / Manoy	• New road construction • SH60 Intersection improvements	• Relatively short route could which could attract traffic • Limited adjoining residential land use	• Requires land purchase • School and parks nearby
Option 5 Traffic Management Only	• Temporary signage only	• Low cost	• Only provides relief during peak season • Could be seen as being unattractive

As can be seen from the table above, all options have a number of pluses and minuses. Accordingly, we are seeking your views on which option(s) you see as being appropriate and beneficial for Motueka.

Listed below are some questions, please take the time to answer these and return to the address provided.

We would welcome your response by 17th November 2009.

Feedback Form

Do you agree with the identified issues? Yes ☐ No ☐
If No, why?

.....

.....

Are there other issues which you would like to see addressed? Yes ☐ No ☐
If Yes, please outline these below

.....

.....

Do you agree with the options for High Street improvements? Yes ☐ No ☐
If No, why?

.....

.....

Are there any other improvements you would like to see implemented? Yes ☐ No ☐
If Yes, please outline these below

.....

.....

Do you think an alternative through route is needed? Yes ☐ No ☐

Should this alternative route attract all through traffic, just holiday traffic or just heavy vehicle traffic?

All through traffic ☐
Holiday traffic ☐
Heavy vehicle traffic ☐

Which of the alternative through route options identified do you think would be most beneficial for Motueka?

Option 1: Thorp Street ☐
Option 2: Queen Victoria Street ☐
Option 3: Vosper Street ☐
Option 4: Talbot Street ☐
Option 5: Traffic Management ☐

Any other comments:

.....

.....

Please return this prior to 17th November to:

The Transportation Manager
Tasman District Council
Private Bag 4, Richmond
Nelson 7050

Figure 1: Conceptual Layout of Possible Improvements

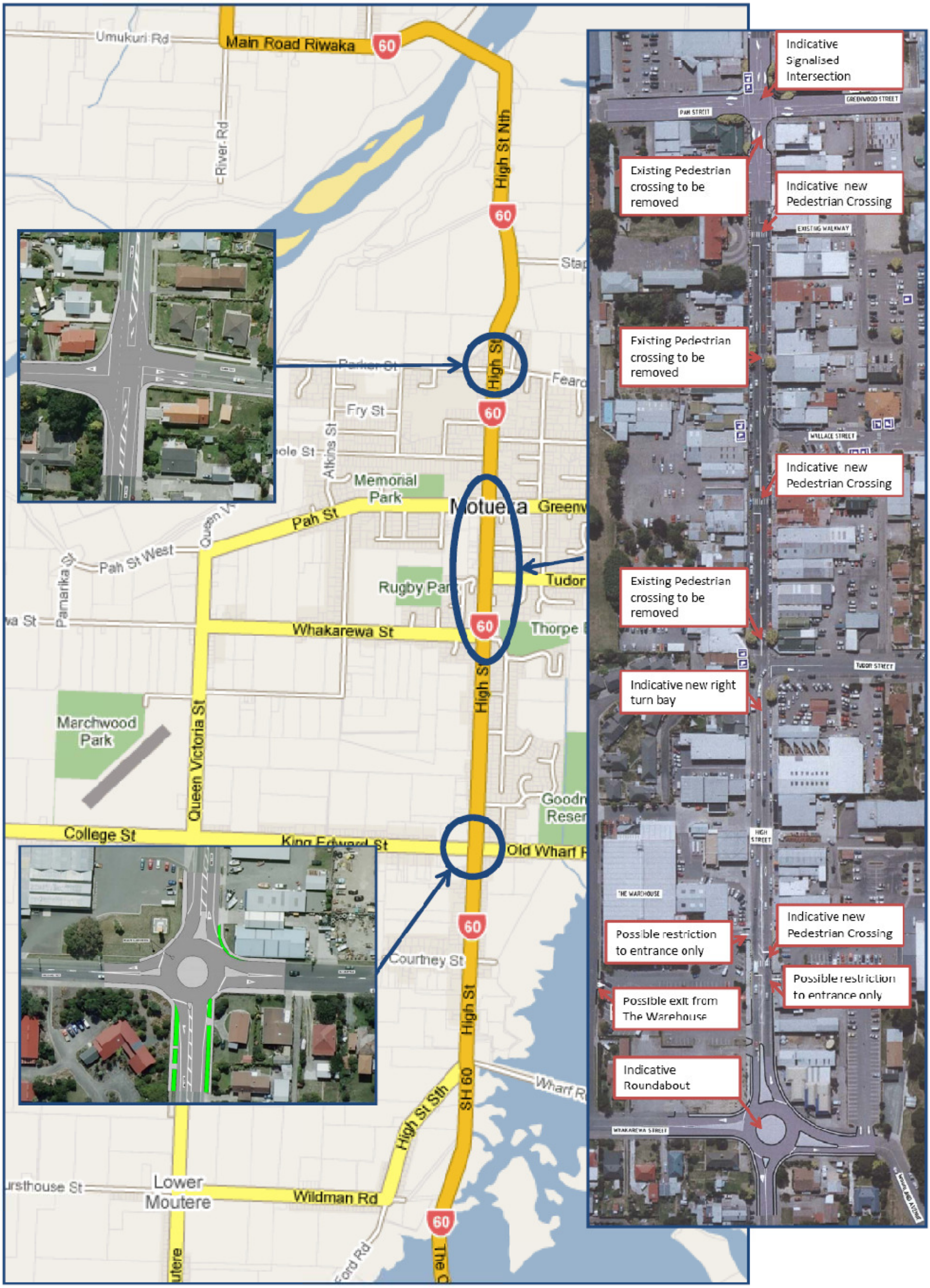
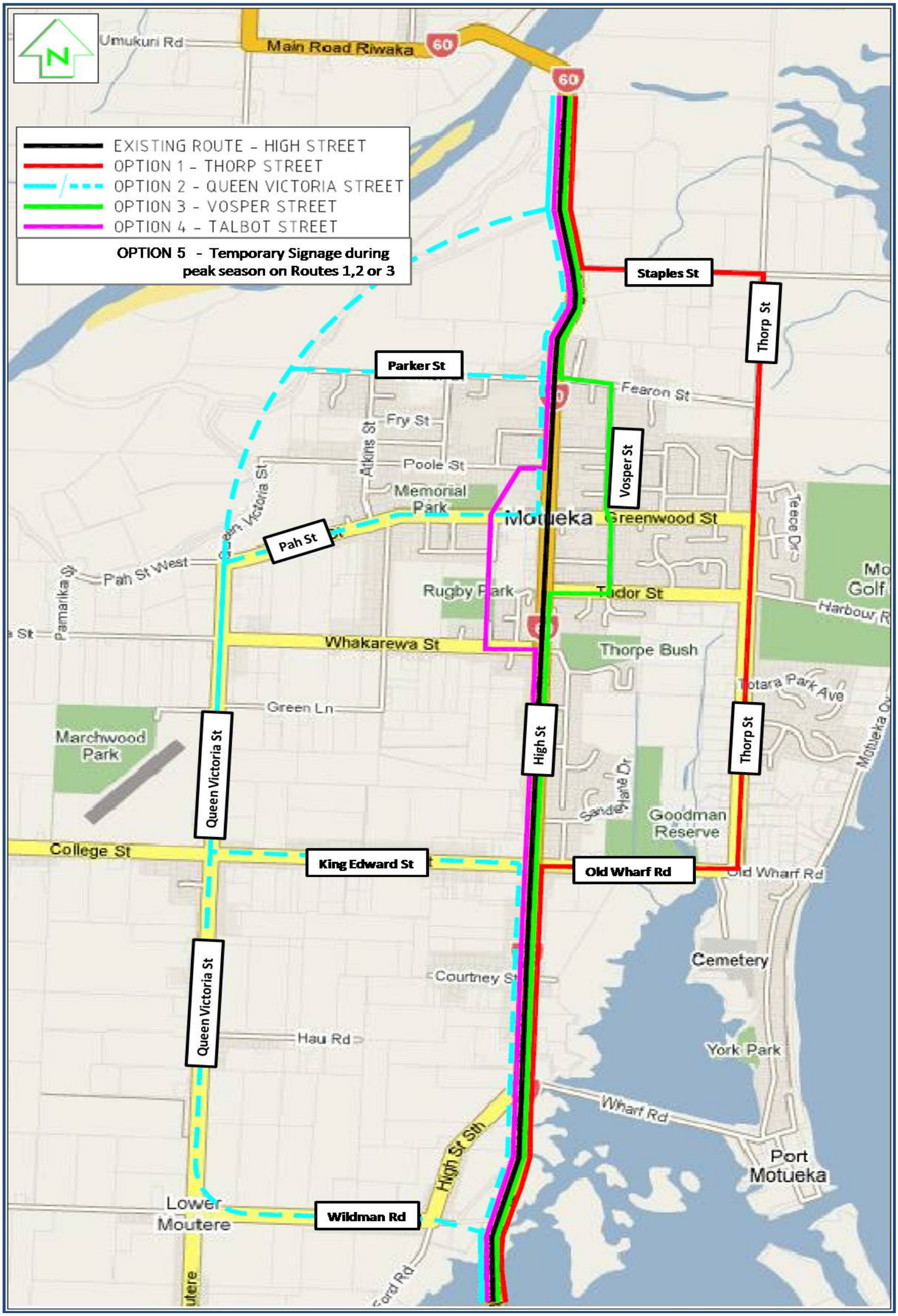


Figure 2: Potential Alternative Through Route Options



Automobile Association

Feedback Form

Do you agree with the identified issues? Yes ☑ No ☐
If No, why?

.....

.....

Are there other issues which you would like to see addressed? Yes ☑ No ☐
If Yes, please outline these below

See letter

.....

.....

Do you agree with the options for High Street improvements? Yes ☑ No ☐
If No, why?

.....

.....

Are there any other improvements you would like to see implemented? Yes ☑ No ☐
If Yes, please outline these below

See letter

.....

.....

Do you think an alternative through route is needed? Yes ☑ No ☐

Should this alternative route attract all through traffic, just holiday traffic or just heavy vehicle traffic?

- All through traffic ☐
- Holiday traffic ☐
- Heavy vehicle traffic ☑

Which of the alternative through route options identified do you think would be most beneficial for Motueka?

- Option 1: Thorp Street ☑
- Option 2: Queen Victoria Street ☐
- Option 3: Vosper Street ☐
- Option 4: Talbot Street ☐
- Option 5: Traffic Management ☐

Any other comments:

.....

.....

Please return this prior to 17th November to:

The Transportation Manager
Tasman District Council
Private Bag 4, Richmond
Nelson 7050

THE NEW ZEALAND
AUTOMOBILE
ASSOCIATION
INCORPORATED

45 Halifax Street
Nelson 7010
PO Box 164
Nelson 7040
T. +64 3 548 8339
F. +64 3 546 9181

The Transport Manager
Tasman District Council
Private Bag 4
Richmond
Nelson 7050

18th November 2009

RE: CONSULTATION DOCUMENT MOTUEKA TRANSPORTATION STUDY

Mitigating congestion on High Street (Town Centre) must take urgency to provide immediate relief. We believe the issues that will arise with the development to the west of High Street should be dealt with as a separate study based on long term planning taking into account all services including roading connecting to High Street and SH60.

Our submission is therefore presenting ideas on reducing congestion, improving safety and improving flow of traffic through High Street, recognising it is a state highway.

Comment on Consultation Document

2. Key Issues

Pedestrians and cyclists on SH60

Agree with comments given. Pedestrians using the crossing individually is restricting traffic most of which is passing through the town centre. The action of some pedestrians walking out in front of large trucks is frightening for truck drivers and a real safety concern for pedestrians. Traffic flow through the town is stop/start, very inefficient causing high fuel use and high gas emissions.
High Street is very narrow forcing cyclists to take a car position. There is a high risk of cyclist collecting an open car door.

Traffic Capacity

Agree with comments given. Our comments above emphasise the very inefficient movement of traffic together with traffic turning right into High Street is difficult and very time consuming. The single biggest restriction on High Street is the Tudor Street intersection whereby traffic moving north cannot pass traffic turning right into Tudor Street.

Alternative Routes through Motueka

Agree with comments.

3. Improvement Options

Agree with two main categories

1. Local improvements on SH60 and within the town to be classified as urgent
2. Short to medium term alternative through alternative through route options.

3.1 Local Improvements

Totally agree with roundabouts at the King Edward Street/Old Wharf Road with High Street and intersection of Whakawera and High Street including suggested exits from New World and the Warehouse. In conjunction with installing traffic signals at the intersection with Pah and Greenwood Street (the busiest intersection) that will facilitate pedestrians crossing High Street, a huge safety benefit.

These three major improvements will facilitate smooth efficient traffic flows into and exiting from High Street.

We certainly agree with relocation of the three zebra crossings together with removing the trees and intrusion of curb-side opposite intersection of Tudor Street and High Street to allow a right hand turning lane to be created.

We submit that it is crucial to install signalised pedestrian crossings in the new locations as shown on map to overcome the major problem of inefficient traffic flows identified above.

The above remedies make up a collective package of change that will immediately rectify identified problems.

Additional changes to enhance efficient traffic flows and safety issues are:

Right hand turns into High Street is difficult and disruptive. We submit that Wallace Street be reinstated two way street and together with Tudor Street have no right turns.

Eliminating right hand turn on Tudor and Wallace Streets is suggested on the basis of the installed roundabouts and traffic signals together with traffic movements using Wilkinson, Vosper, Inglis, Saxton, Thorp and Fearon Streets going North or Tudor, Thorp and Old Wharf Road going south to the East of Township. To the West of High Street you have King Edward, Whakawera, and Pah Streets.

3.2 Short to Medium Alternative through- Route Options

Option 1:

We support the need to allow heavy vehicle traffic to bypass High Street using Thorp Street between Staples Street and Old Wharf Road. The roundabout at King Edward/Old Wharf Road is an essential transfer from and to High Street but submit a roundabout at High Street and Staples Street would be desirable to facilitate smooth transfer at both ends of the alternative route.

Roundabouts at Wharf Rd (exits now) together with additional roundabouts at King Edward Street and at Whakawera Street and Lights on Pah St immediately allow smooth regulated flow of traffic.

In the medium term improved linkage from northern end of Queen Victoria St to Parker St would have real benefits in the future. Suggested new route traversing the base of the stop banks connecting to SH60 would be unrealistic in terms of cost and the taking of productive rural land. The suggested short cut at the southern end of Wildman's Rd would require entry on to the Mariri Highway causing increased safety issues which we regard as unacceptable when the current roundabout is so close and a considerable more appropriate and safer method of traffic entry/exit mechanism

Option 3:
These roads become more efficient with installation of light signals at the Greenwood/Pah Street intersection.

Option 4:
TDC need to institute and plan this link as soon as possible as a medium term project

Summary
The Thorp Street bypass route would provide the additional benefit of removing through traffic, particularly the heavy trucks, off High Street through the CBD. The roundabouts and signal lights together with other minor changes mentioned above, would remedy all current identified problems.

Any further queries should be directed to our Deputy Chairman and TDC liaison Paul Heywood.
Yours Sincerely

Heather Jurgens
Nelson District Manager
New Zealand Automobile Association

From: **Bicycle Nelson Bays** <bnbnelson@gmail.com>
Date: 2009/11/18
Subject: Motueka Transportation Study
To: gary.clark@tasman.govt.nz

Dear Gary:

thank you for the opportuntiy to comment on this study. However, due to the very short time frame we have been unable to discuss the proposal fully with our members.

BNB is opposed to the proposal to install two new roundabouts in SH60. Roundabouts are dangerous for cyclists and offputting to all but the most confident cyclists.

BNB believes the focus should be on traffic calming in the shopping precinct between Whakarewa and Pah Streets with a greater priority given to walking and cycling. This short stretch is the heart of Motueka. To this end BNB supports recommendations e3, 6, 7 and 8 and proposes that other interventinos are considered such as the reduction of parking on SH60.

BNB is also concerned at vehicles entering SH60 from shops. These crossings create conflict points between vehicles and pedestrians and cyclists. The worst of these conflict points is the Shell Petrol Station. It is critical that the vehilce crossing into the petrol station is treated so that this conflict is reduced.

Bicycle Nelson Bays (BNB)

Contacts:
Anne FitzSimon 539-0527 or 021 1123-890
Richard Butler 539-0355 ah
E-mail: bnbnelson@gmail.com

--
Bicycle Nelson Bays (BNB)

Tiakina te Taiao

TO: Gary Clark
TDC

From: Ann Sheidan

Date: 17/11/09

Fax: 4 pages including coversheet.

Message:

Kia ora Gary
Here is Tiakina te Taiao's submission on the Motueka Transportation Study.

Thank you for the opportunity to comment.

Na
Ann Sheidan
Environmental Manager
for Tiakina Board.

PO Box 1666 Nelson 7040 • Tel (03) 546-7842 • Fax (03) 546-7860 • tarl@tiakina.co.nz

MOTUEKA TRANSPORTATION STUDY – CONSULTATION DOCUMENT

This submission has been prepared by Tiakina te Taiao Ltd with assistance from Wakatu Incorporation's staff and consultants associated with the Motueka West proposed plan change.

Tasman District Council, Wakatu Incorporation and Ngati Rarua Atiawa Iwi Trust have been working together since 2006 on a proposed plan change to meet the expected growth of Motueka over the next 50 years.

This plan change will facilitate significant areas of new development with major implications for the volumes and distribution of traffic in the Motueka area. As a consequence, it was our understanding was that this Transportation Study was to provide the necessary inputs so that the proposed plan change could be finalised and notified.
Instead, the consultation document virtually ignores the potential impacts of this development, and hence does not appropriately address the issues associated with the future of Motueka.

The consultation document has effectively dismissed the possibility of a bypass and new bridge without this position being based upon any analysis. The resulting short to medium term outlook does not address the longer terms needs of the town, or how a strategy might be developed which ensures longer term solutions are not precluded by short term fixes.

The document provides no numerical information regarding existing or projected traffic volumes to permit an informed opinion of the proposals. A separate request has been made for this information and some of the comments made in this submission may vary once the data has been received and reviewed.

The Feedback Form provided has specific questions that deal with the details of the proposals and these are answered below.

Do you agree with the identified issues? No.
All of the proposals a short term fixes that will be suitable for only a 1 to 3 year time frame or until there is another major retail / commercial development constructed in the area.
The issues appear to have been based upon a qualitative assessment, rather than any rigorous analysis of numerical information relating to current and forecast traffic volumes, travel times and crash information.
There is a presumption that problems only exist for a short period each year during the summer holiday period. Whilst this is the worst period in terms of traffic volumes, the High Street provides a poor level of service at other times of the year.

Are there other issues which you would like to see addressed? Yes
Council supported by Wakatu Incorporation and NRAIT have put a lot of time and expense into looking at the projected growth of Motueka in the medium to long term. As a consequence, a proposal has been brought together for the development of the land bounded by King Edward St, Queen Victoria St, Whakarewa St, High St and the area bounded by Whakarewa St, Grey St, Pah St, Queen Victoria St, for future residential, commercial and industrial growth. This work has looked at the future growth of Motueka for the next 50 years and is supported by various demographic reports. .
This proposal has been the subject of public consultation and the outcome demonstrates that the community is supportive of the proposals.

This consultation document does not address any of the transportation issues that such a plan change will generate.

Do you agree with the options for High Street improvements? Yes
However these improvements are all short term and it is likely that they will not improve traffic flows that exist at present.

Are there any other improvements you would like to see implemented? No
It is presumed that this question relates to improvements to High Street and not the wider area.

Do you think an alternative route is needed? Yes
The Council and the community have been advocating for a bypass for some years now. Once full allowance is made for the effects of likely development, it is likely that traffic flow data will support the need for such a bypass.

In the peak summer period, and increasingly at other times, the High Street offers a very poor level of service, for both local and through traffic. Only the removal of a significant proportion of this traffic to a convenient alternative route will adequately address this problem.

The focus of transportation policy for Motueka should be upon the achievement of a bypass and new bridge, with an implementation strategy.

Should this alternative route attract all through traffic, just holiday traffic or just heavy vehicle traffic?

Projected traffic volumes (which take into account the effects of development) will demonstrate that a bypass option will be required in the near future for all through traffic. However there is a short term traffic problem in the summer months that needs to be addressed immediately.

The various options and timing is discussed later in this submission.

Which of the alternative through route options identified do you think would be most beneficial for Motueka?
Option 1: Thorp Street.
The majority of this route is along residential streets and therefore is unsuitable for such a bypass route.
Further the construction costs of upgrading the route to take heavy traffic will be very high as the ground conditions are not good for such a route as better alternatives are available.

Option 2: Queen Victoria Street.
In developing the preliminary structure plan for the proposed plan change this was the route that was identified as having the least impact on the existing community. The advantages of this route are:

a) The existing route is predominantly rural in nature and there would be fewer residential properties affected;
b) The proposed route would provide direct access to the proposed industrial area associated with the plan change;
c) The route can be progressively upgraded to suit traffic demand over a number of years; and
d) A link to SH60 at the south can be created via Wildman Rd .

In the short term the bypass could use King Edward Street.

e) At the northern end the route should link around the back of Parker Street and connect to SH60 at a point to the north of Staples Street.

In the short term Pah Street would have to be used, however some works would be required at the Queen Victoria / Pah Street intersection. Te Awhina Marae is located at this corner and vehicle speeds through this intersection are already a problem.

This northern link would also be positioned well for a future bridge crossing of the Motueka River which will have to be constructed at some stage in the future.

Option 3: Vosper Street.
This is a possible short term option that is unlikely to be supported by the traffic data and does not provide a solution for the future.

Option 4: Talbot Street.
This is a possible short term option that is unlikely to be supported by the traffic data and does not provide a solution for the future.

Option 5: Traffic Management
This option is a possible very short term solution that is unlikely to be cost effective and will only create confusion to travellers. As such, it should not be considered.

Any other comments.
Council, the community and NZTA have an opportunity now to plan for the future transportation needs of Motueka into the future. The needs of the community in the future can be planned so that all future development and physical works undertaken on the roading infrastructure take account of of the ultimate transportation plan for the town for the next 50 years. This consultation document is very lightweight, is not based on any quantitative analysis and takes a purely short-term focus. .

Should you wish to discuss any aspects of this submission, please direct questions to Ray Molineux at 04-904-0316.

5 November 2009.

ROAD TRANSPORT ASSOCIATIONS

PO Box 9033, Nelson 7044
Email: gturner@nzrta.co.nz
Phone: 03 546 5629

12 November 2009

The Transportation Manager
Tasman District Council
Private Bag 4, Richmond
Nelson 7050

Motueka Transport Study.

Introduction.
NZ Road Transport Association Region 4 is a constituent member of Road Transport Forum NZ, representing goods transport operators in the hire and reward sector. The Association represents more than 500 members, operating approximately 2200 trucks in the South Island north of the Waitaki River and includes transport operators in the Marlborough, Nelson and West Coast Regions.

This includes over 100 members of the Nelson Bays branch operating in excess of 400 trucks. In addition members serve the Nelson/Tasman Region from other centers, particularly Canterbury, Marlborough and the West Coast but also other locations including the North Island.

Members service all sectors of the economy and operate fleets ranging from single vehicle owner operators to fleet operators with in excess of 100 trucks in multiple locations. Members service the region with intra and inter-regional operations and services. Many members offer multi-faceted operations including road transport services, warehousing, import and export services, customs clearing, freight forwarding, container handling and storage.

The road transport industry provides all of the land transport for all products grown, produced, manufactured, exported from, imported into and distributed to or from the Tasman Region. Major products carried include logs from forests, wood products and wood chips, horticultural products and fish products as well as manufactured goods.

Submission.

Identified Issues.

Pedestrians and Cyclists: We agree with the concerns expressed pertaining to pedestrians and the use of crossings. We would fully support the installation of controlled crossings. We believe this would improve pedestrian safety and allow traffic flow breaks for traffic crossing or entering High Street from side roads. Most importantly for us we believe the result will be improved traffic flow through SH6 rather than having the current "Brown's cows effect" that currently exists and causes considerable frustration to through traffic.
While not sure of what lack of on road cycle provisions covers we would normally support to the provision of cycle lanes but in this case do not believe there to be the available space unless it is provided by the removal of parking.

Traffic Capacity: While congestion peaks during the Christmas/New Year period we do feel that congestion can be a problem at other times and in fact there is a high demand throughout the summer and during the fruit harvest with extra workers in town and vehicles servicing the orchards many of them heavy trucks. Congestion will continue to grow unless increasing traffic volumes are catered for. Control of pedestrians will assist traffic flow although an alternative route for through traffic during these peak periods would alleviate current frustrations and enhance the Motueka experience for those choosing to visit the central area.

Routes through Motueka: State Highway 60/High Street remains the most direct route and will remain the route of choice until an alternative of similar distance and improved travel time is provided. This alternative could well be the Queen Victoria Street option however to be an attractive alternative especially for larger vehicles treatments as suggested would be needed. At the Nelson end either a direct link from Wildman Road to SH60 or at a minimum intersection treatment at the intersection of SH60 and King Edward Street allowing easy access for south east bound traffic to SH60. We note you suggest a roundabout and we support that suggestion and in fact believe this is needed whether as part of a bypass or not.
At the Takaka end of the proposed Queen Victoria Street Bypass we have real concerns about the space and ability of larger truck units to safely negotiate the intersections with SH60 at Pah, Poole and Parker Streets. There is also a perception that these also bring traffic back into the town and defeats the purpose of a bypass. We therefore would support this bypass provided the link traversing the base of the stop banks and connecting to SH60 north of Staples Street were built in conjunction with the SE end improvements as above.

Feedback Form.

Do you agree with the indentified issues?
Yes. We feel the main issue you correctly identify is congestion and the rest a contributing factors.

Are there other issues?
Control of pedestrians. We have real concerns over the visibility of pedestrians by motorists with the current crossing layouts due to the footpath furniture and shading.

Do you agree with the options for High St. improvements?
The most important improvement for us would be the installation of a roundabout with the intersection of King Edward St. We also support controlled pedestrian crossing. With regard to the intersection treatments at Pah St. and Whakarewa St. we feel the improved side street access must be weighed against the disruption to through traffic which when addressing the actual issue should be priority.

Are there any other improvements you would like to see implemented?
Yes. 1) Restricted traffic access and egress into individual businesses directly from High St. 2) The improvements as given above to a possible Queen Victoria St. bypass.

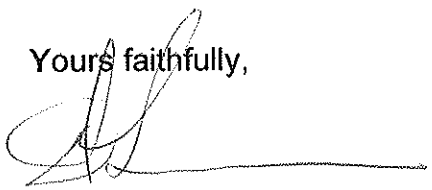
Do you think an alternative through route is needed?
Yes but it must be attractive to use.

a) The alternative route should be available to all traffic but any busy times heavy traffic, those towing trailers and other through traffic should be encouraged to use it.
b) Our choice of alternative route would be the Queen Victoria St. option subject to the treatments when connecting back onto SH60 as given above are carried out. Short term until works are completed Thorp St. is an option especially for SE bound traffic although this could be both ways if access back onto SH60 at Staples St. were made easier.

Summary.

We believe that if the Queen Victoria Bypass were to have the improvements suggested it may well become the route of choice for many travelling through Motueka The removal of this traffic flow would alleviate most of the current congestion problems in the township and may result in much of the suggested works in High St. not being required and invalidate many of our thoughts on High St improvements. To achieve this the bypass must offer uninterrupted traffic flow with easy access and egress back onto SH60 at both ends.

Yours faithfully,



Grant Turner
Area Manager
Nelson, Marlborough, Buller & West Coast

Unknown respondent

Feedback Form

Do you agree with the identified issues? Yes ☑ No ☐
If No, why?

.....

.....

Are there other issues which you would like to see addressed? Yes ☐ No ☑
If Yes, please outline these below

.....

.....

Do you agree with the options for High Street improvements? Yes ☑ No ☐
If No, why?

.....

.....

Are there any other improvements you would like to see implemented? Yes ☐ No ☑
If Yes, please outline these below

.....

.....

Do you think an alternative through route is needed? Yes ☑ No ☐

Should this alternative route attract all through traffic, just holiday traffic or just heavy vehicle traffic?

All through traffic ☐
Holiday traffic ☐
Heavy vehicle traffic ☑

Which of the alternative through route options identified do you think would be most beneficial for Motueka?

Option 1: Thorp Street ☑
Option 2: Queen Victoria Street ☑
Option 3: Vosper Street ☐
Option 4: Talbot Street ☐
Option 5: Traffic Management ☐

Any other comments:

.....

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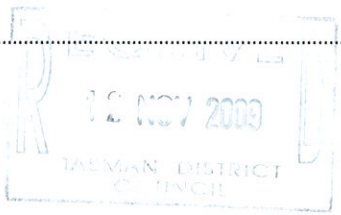
Please return this prior to 17th November to:
The Transportation Manager
Tasman District Council
Private Bag 4, Richmond
Nelson 7050



Feedback Form

Do you agree with the identified issues? Yes ☒ No ☐
If No, why?

.....

.....

Are there other issues which you would like to see addressed? Yes ☒ No ☐
If Yes, please outline these below

No right turn into Wallace St + Widen road to allow turning into Tudor St.

Do you agree with the options for High Street improvements? Yes ☒ No ☐
If No, why?

But, unsure about pedestrian crossing near Warehouse.

Are there any other improvements you would like to see implemented? Yes ☒ No ☐
If Yes, please outline these below

Warehouse cars exit onto Whakarewa St + no exiting New World onto High St

Do you think an alternative through route is needed? Yes ☒ No ☐

Should this alternative route attract all through traffic, just holiday traffic or just heavy vehicle traffic?

- All through traffic ☐
- Holiday traffic ☐
- Heavy vehicle traffic ☒

Which of the alternative through route options identified do you think would be most beneficial for Motueka?

- Option 1: Thorp Street ☒
- Option 2: Queen Victoria Street ☐
- Option 3: Vosper Street ☐
- Option 4: Talbot Street ☐
- Option 5: Traffic Management ☐

Any other comments:

.....

.....

Please return this prior to 17th November to:

The Transportation Manager
Tasman District Council
Private Bag 4, Richmond
Nelson 7050

Jack L Inglis
Jack L Inglis

Motueka Transport Study Commentary: Additional Comments

Eventually Motueka may require a bypass. Any bypass should be Queen Victoria St onto River Road Riwaka, if a new bridge is to be built, or connect back onto the existing road north of the town prior to the existing bridge.

The land between Greenwood, Tutor, Wilkinson and High Streets should be completely rezoned commercial in the hope that eventually the main retail zone will fall within that area and Decks Reserve becomes a 'town square'.

Join Talbot and Manoy Streets and enable access to the Whitwells carpark via the southern end Parklands school grounds. This will take some of the delivery vehicles off the street. This may also alleviate congestion at Pah & High St intersection as vehicles could then use the roundabout at Whakarewa St High St intersection.

In the short term Thorp St is the ideal solution to traffic issues combined with the changes outlined to High Street. Minor changes required to make this workable e.g. corners of Thorp at Staples and Old Wharf Road.

The roundabouts at King Edward and Whakarewa Streets are long overdue.

Some of the trees and bollards along High Street in the CBD need to be moved back off the road to better enable traffic flows.

Jack L Inglis

(Motueka Ward Councillor)

Appendix H – Preliminary Cost Estimates

Motueka Transportation Study, Intersection Upgrades Feasibility Estimate - Site 1 (Option 2 Extn: Pah to Parker)				FE
Item	**Description**	**Base Estimate**	**Contingency**	**Funding Risk**
A	**Project Property Costs**	$427,500	$128,250	$213,750
B	**Investigation and Reporting**	$79,308	$23,792	$39,654
C	**Design and Project Documentation**	$111,031	$33,309	$55,516
	Construction			
1	**Monitoring MSQA, Transit Managed Costs & Consent Monitoring fees**	$50,000	-	-
	Physical Works			
2	Environmental Compliance	$25,000		
3	Earthworks	$209,050		
4	Ground Improvements	$0		
5	Drainage	$100,000		
6	Pavement and Surfacing	$683,840		
7	Bridges	$0		
8	Retaining Walls	$0		
9	Traffic Services	$111,580		
10	Service Relocations	$30,000		
11	Landscaping and Urban Design	$94,000		
12	Traffic Management and Temporary Works	$22,500		
13	Preliminary and General	$260,194		
14	Extraordinary Construction Costs	$0		
D	Total Construction	$1,586,164		
Total Base Estimate		**$2,204,004**		
E	Assessed/~~analysed~~ contingency		$661,201	
Expected Estimate			**$2,865,205**	
F	Assessed/~~analysed~~ contingency			$1,102,002
95th percentile Estimate				**$3,306,006**

Date of Estimate: August 2009	Cost index	
Estimate prepared by: Paul Brophy	Signed	
Estimate internal peer review by: Jeremy Walters	Signed	
Estimate external peer review by: N/A	Signed	N/A

Note: ***(1) These estimates are exclusive of escalation and GST.***

Motueka Transportation Study, Intersection Upgrades Feasibility Estimate - Site 1 (Option 2: Parker to SH60)				FE
Item	**Description**	**Base Estimate**	**Contingency**	**Funding Risk**
A	**Project Property Costs**	$562,500	$168,750	$281,250
B	**Investigation and Reporting**	$103,279	$30,984	$51,639
C	**Design and Project Documentation**	$144,590	$43,377	$72,295
	Construction			
1	**Monitoring MSQA, Transit Managed Costs & Consent Monitoring fees**	$67,000	-	-
	Physical Works			
2	Environmental Compliance	$25,000		
3	Earthworks	$220,954		
4	Ground Improvements	$0		
5	Drainage	$130,000		
6	Pavement and Surfacing	$957,120		
7	Bridges	$0		
8	Retaining Walls	$0		
9	Traffic Services	$139,240		
10	Service Relocations	$30,000		
11	Landscaping and Urban Design	$132,000		
12	Traffic Management and Temporary Works	$27,000		
13	Preliminary and General	$337,263		
14	Extraordinary Construction Costs	$0		
D	Total Construction	$2,065,577		
Total Base Estimate		**$2,875,946**		
E	Assessed/~~analysed~~ contingency		$862,784	
Expected Estimate			**$3,738,730**	
F	Assessed/~~analysed~~ contingency			$1,437,973
95th percentile Estimate				**$4,313,919**

Date of Estimate: August 2009	Cost index	
Estimate prepared by: Paul Brophy	Signed	
Estimate internal peer review by: Jeremy Walters	Signed	
Estimate external peer review by: N/A	Signed	N/A

Note: ***(1) These estimates are exclusive of escalation and GST.***

Motueka Transportation Study, Intersection Upgrades Feasibility Estimate - Site 2 (SH60/Parker/Fearon)				FE
Item	**Description**	**Base Estimate**	**Contingency**	**Funding Risk**
A	**Project Property Costs**	$5,000	$1,500	$2,500
B	**Investigation and Reporting**	$10,000	$3,000	$5,000
C	**Design and Project Documentation**	$15,000	$4,500	$7,500
	Construction			
1	**Monitoring MSQA, Transit Managed Costs & Consent Monitoring fees**	$9,000	-	-
	Physical Works			
2	Environmental Compliance	$3,000		
3	Earthworks	$21,651		
4	Ground Improvements	$0		
5	Drainage	$20,000		
6	Pavement and Surfacing	$73,120		
7	Bridges	$0		
8	Retaining Walls	$0		
9	Traffic Services	$6,260		
10	Service Relocations	$11,000		
11	Landscaping and Urban Design	$12,000		
12	Traffic Management and Temporary Works	$18,000		
13	Preliminary and General	$34,906		
14	Extraordinary Construction Costs	$0		
D	Total Construction	$208,937		
Total Base Estimate		**$238,937**		
E	Assessed/~~analysed~~ contingency		$71,681	
Expected Estimate			**$310,618**	
F	Assessed/~~analysed~~ contingency			$119,469
95th percentile Estimate				**$358,406**

Date of Estimate: August 2009	Cost index	
Estimate prepared by: Paul Brophy	Signed	
Estimate internal peer review by: Jeremy Walters	Signed	
Estimate external peer review by: N/A	Signed	N/A

Note: ***(1) These estimates are exclusive of escalation and GST.***

Motueka Transportation Study, Intersection Upgrades Feasibility Estimate - Site 3 (High Street - Tudor to Pah)				FE
Item	**Description**	**Base Estimate**	**Contingency**	**Funding Risk**
A	**Project Property Costs**	$0	$0	$0
B	**Investigation and Reporting**	$11,000	$3,300	$5,500
C	**Design and Project Documentation**	$15,000	$4,500	$7,500
	Construction			
1	**Monitoring MSQA, Transit Managed Costs & Consent Monitoring fees**	$9,000	-	-
	Physical Works			
2	Environmental Compliance	$3,000		
3	Earthworks	$4,577		
4	Ground Improvements	$0		
5	Drainage	$0		
6	Pavement and Surfacing	$16,310		
7	Bridges	$0		
8	Retaining Walls	$0		
9	Traffic Services	$315,750		
10	Service Relocations	$11,000		
11	Landscaping and Urban Design	$16,000		
12	Traffic Management and Temporary Works	$18,000		
13	Preliminary and General	$78,827		
14	Extraordinary Construction Costs	$0		
D	Total Construction	$472,464		
Total Base Estimate		**$498,464**		
E	Assessed/~~analysed~~ contingency		$149,539	
Expected Estimate			**$648,004**	
F	Assessed/~~analysed~~ contingency			$249,232
95th percentile Estimate				**$747,697**

Date of Estimate: August 2009	Cost index	
Estimate prepared by: Paul Brophy	Signed	
Estimate internal peer review by: Jeremy Walters	Signed	
Estimate external peer review by: N/A	Signed	N/A

Note: ***(1) These estimates are exclusive of escalation and GST.***

Motueka Transportation Study, Intersection Upgrades Feasibility Estimate - Site 4 (High Street - Whakarewa to Tudor)				FE
Item	**Description**	**Base Estimate**	**Contingency**	**Funding Risk**
A	**Project Property Costs**	$37,500	$11,250	$18,750
B	**Investigation and Reporting**	$15,000	$4,500	$7,500
C	**Design and Project Documentation**	$20,500	$6,150	$10,250
	Construction			
1	**Monitoring MSQA, Transit Managed Costs & Consent Monitoring fees**	$14,000	-	-
	Physical Works			
2	Environmental Compliance	$3,000		
3	Earthworks	$35,326		
4	Ground Improvements	$0		
5	Drainage	$10,000		
6	Pavement and Surfacing	$147,226		
7	Bridges	$0		
8	Retaining Walls	$0		
9	Traffic Services	$7,500		
10	Service Relocations	$11,000		
11	Landscaping and Urban Design	$3,000		
12	Traffic Management and Temporary Works	$27,000		
13	Preliminary and General	$50,710		
14	Extraordinary Construction Costs	$0		
D	Total Construction	$308,762		
Total Base Estimate		**$381,762**		
E	Assessed/~~analysed~~ contingency		$114,529	
Expected Estimate			**$496,291**	
F	Assessed/~~analysed~~ contingency			$190,881
95th percentile Estimate				**$572,644**

Date of Estimate: August 2009	Cost index	
Estimate prepared by: Paul Brophy	Signed	
Estimate internal peer review by: Jeremy Walters	Signed	
Estimate external peer review by: N/A	Signed	N/A

Note: ***(1) These estimates are exclusive of escalation and GST.***

Motueka Transportation Study, Intersection Upgrades Feasibility Estimate - Site 5 (SH60/Whakarewa)				FE
Item	**Description**	**Base Estimate**	**Contingency**	**Funding Risk**
A	**Project Property Costs**	$12,000	$3,600	$6,000
B	**Investigation and Reporting**	$11,000	$3,300	$5,500
C	**Design and Project Documentation**	$15,000	$4,500	$7,500
	Construction			
1	**Monitoring MSQA, Transit Managed Costs & Consent Monitoring fees**	$11,000	-	-
	Physical Works			
2	Environmental Compliance	$3,000		
3	Earthworks	$15,141		
4	Ground Improvements	$0		
5	Drainage	$15,000		
6	Pavement and Surfacing	$63,330		
7	Bridges	$0		
8	Retaining Walls	$0		
9	Traffic Services	$8,565		
10	Service Relocations	$26,000		
11	Landscaping and Urban Design	$10,000		
12	Traffic Management and Temporary Works	$27,000		
13	Preliminary and General	$35,507		
14	Extraordinary Construction Costs	$0		
D	Total Construction	$214,543		
Total Base Estimate		**$252,543**		
E	Assessed/~~analysed~~ contingency		$75,763	
Expected Estimate			**$328,306**	
F	Assessed/~~analysed~~ contingency			$126,272
95th percentile Estimate				**$378,815**

Date of Estimate: August 2009	Cost index	
Estimate prepared by: Paul Brophy	Signed	
Estimate internal peer review by: Jeremy Walters	Signed	
Estimate external peer review by: N/A	Signed	N/A

Note: ***(1) These estimates are exclusive of escalation and GST.***

Motueka Transportation Study, Intersection Upgrades Feasibility Estimate - Site 6 (Option 2 Southern Extension)				FE
Item	**Description**	**Base Estimate**	**Contingency**	**Funding Risk**
A	**Project Property Costs**	$238,500	$71,550	$119,250
B	**Investigation and Reporting**	$42,000	$12,600	$21,000
C	**Design and Project Documentation**	$60,000	$18,000	$30,000
	Construction			
1	**Monitoring MSQA, Transit Managed Costs & Consent Monitoring fees**	$25,000	-	-
	Physical Works			
2	Environmental Compliance	$20,000		
3	Earthworks	$31,500		
4	Ground Improvements	$0		
5	Drainage	$45,000		
6	Pavement and Surfacing	$587,335		
7	Bridges	$0		
8	Retaining Walls	$0		
9	Traffic Services	$17,050		
10	Service Relocations	$5,000		
11	Landscaping and Urban Design	$37,500		
12	Traffic Management and Temporary Works	$31,500		
13	Preliminary and General	$153,477		
14	Extraordinary Construction Costs	$0		
D	Total Construction	$953,362		
Total Base Estimate		**$1,293,862**		
E	Assessed/~~analysed~~ contingency		$388,159	
Expected Estimate			**$1,682,021**	
F	Assessed/~~analysed~~ contingency			$646,931
95th percentile Estimate				**$1,940,793**

Date of Estimate: August 2009	Cost index	
Estimate prepared by: Paul Brophy	Signed	
Estimate internal peer review by: Jeremy Walters	Signed	
Estimate external peer review by: N/A	Signed	N/A

Note: ***(1) These estimates are exclusive of escalation and GST.***

Motueka Transportation Study, Intersection Upgrades Feasibility Estimate - Site 7 (Option 4)				FE
Item	**Description**	**Base Estimate**	**Contingency**	**Funding Risk**
A	**Project Property Costs**	$466,800	$140,040	$233,400
B	**Investigation and Reporting**	$42,466	$12,740	$21,233
C	**Design and Project Documentation**	$59,452	$17,836	$29,726
	Construction			
1	**Monitoring MSQA, Transit Managed Costs & Consent Monitoring fees**	$37,800	-	-
	Physical Works			
2	Environmental Compliance	$30,000		
3	Earthworks	$102,980		
4	Ground Improvements	$0		
5	Drainage	$20,000		
6	Pavement and Surfacing	$448,350		
7	Bridges	$0		
8	Retaining Walls	$0		
9	Traffic Services	$12,850		
10	Service Relocations	$5,000		
11	Landscaping and Urban Design	$37,500		
12	Traffic Management and Temporary Works	$22,500		
13	Preliminary and General	$132,336		
14	Extraordinary Construction Costs	$0		
D	Total Construction	$849,316		
Total Base Estimate		**$1,418,034**		
E	Assessed/~~analysed~~ contingency		$425,410	
Expected Estimate			**$1,843,444**	
F	Assessed/~~analysed~~ contingency			$709,017
95th percentile Estimate				**$2,127,051**

Date of Estimate: September 2009	Cost index	
Estimate prepared by: Danny Wood	Signed	
Estimate internal peer review by: Jeremy Walters	Signed	
Estimate external peer review by: N/A	Signed	N/A

Note: ***(1) These estimates are exclusive of escalation and GST.***