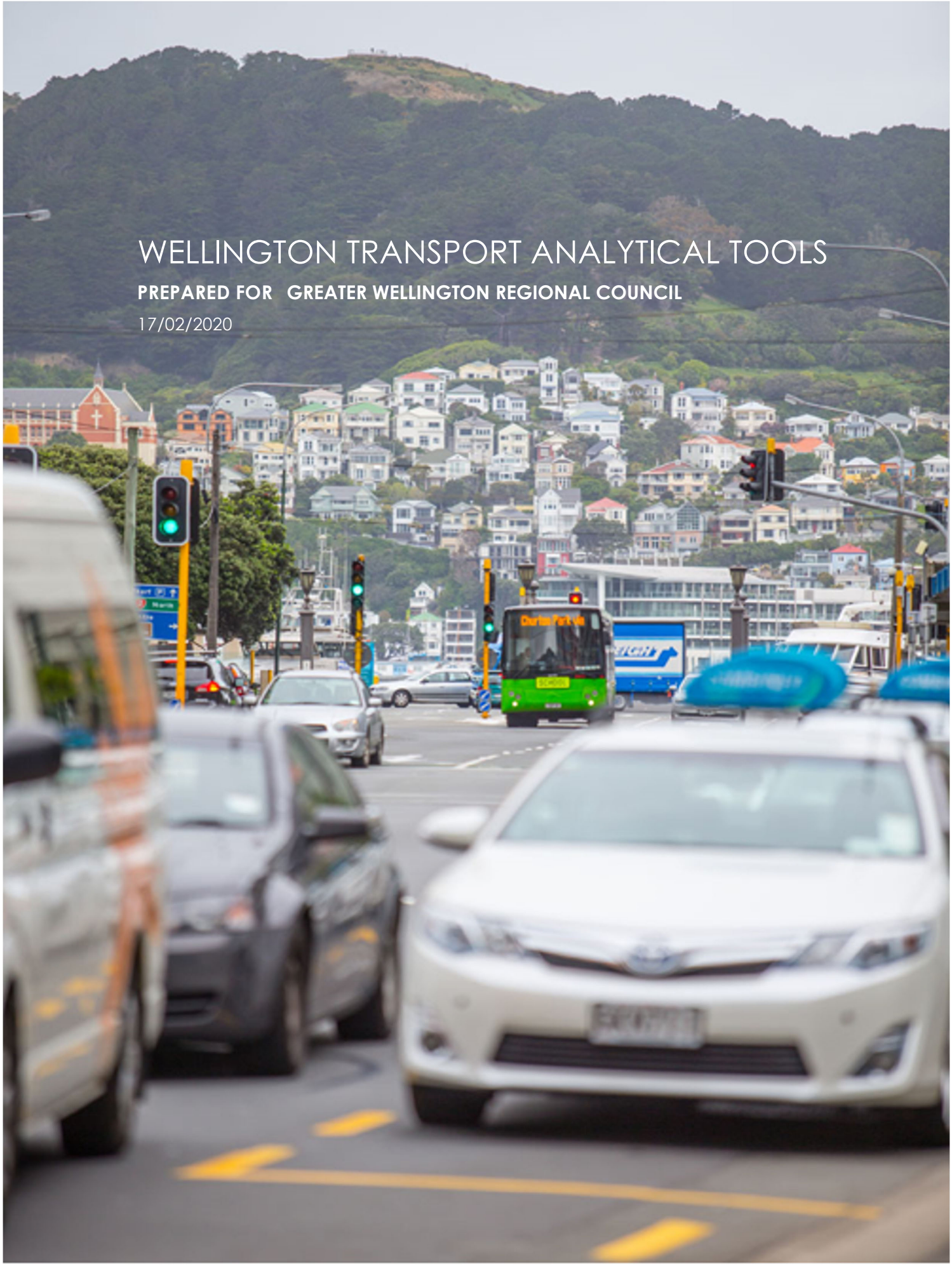

WELLINGTON TRANSPORT ANALYTICAL TOOLS

PREPARED FOR GREATER WELLINGTON REGIONAL COUNCIL

17/02/2020

Stantec | JACOBS

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	5/11/20	Final	DJH	JB	AK	AK

Greater Wellington Regional Council

Wellington Transport Analytical Tools

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APPENDICES

1. Introduction

This technical note is part of a series documenting the 2019-2021 update of components of the Wellington Regional Transportation Planning Analytical Tools ("Analytical Tools", "Tools"). The higher-level Analytical Tools are maintained and operated by Greater Wellington Regional Council (GWRC), who are the client for this project. This project is being primarily delivered by Stantec and Jacobs, supported by GWRC transport planners.

1.1 Purpose of this Report

In the Scoping Workshop, a consensus on which hours would make up each of the time periods to be modelled was not reached. One key challenge is that congestion occurs in different parts of the network at different times. The CBD experiences the worst morning peak congestion between 7 and 9am with the 8 to 9am hour being the slightly higher of the two. On the other hand, morning peak delays on the motorway at Ngauranga occur between 6 to 9am with a peak at 7 to 8am. The hours making up each time period must be selected to take into account the entire region. It is acknowledged that the longer the time period modelled, the potential that lower travel benefits will be indicated by the demand model (based on an average hour assignment) from providing additional road or PT capacity. However, there are options for different assignment types to mitigate this risk. Furthermore, a key purpose of the demand model is to forecast demand for all the other Tools in the Region, as well as enabling the calculation of first order estimates of travel benefits.

It was agreed that the demand model should reflect 24 hours of travel, divided into four time periods representing the AM peak, interpeak, PM peak, and overnight periods. The summation of the four time periods should equal 24 hours without any further factoring. It was also deemed preferable to specify whole hours (i.e. not half past an hour) to maximise use of existing traffic counts.

This report sets out the results of an analysis of available traffic counts at the Analytical Tools Demand Model screenlines for the purpose of determining which hours should be included within each of the four model periods.

2. Methodology

Traffic counts were obtained for sites located on the Demand Model validation screenlines for March 2018, where possible. Where screenline counts were not available for March 2018, counts obtained for other months or years were used after being "normalised" to March 2018 by applying adjustment factors for month and year to the count data. Furthermore, the data used in this analysis utilised the Monday to Friday average flows for each site rather than individual days.

Some 52 sites were used in this analysis ranging from Happy Valley Road in the south to SH1 at Manakau, in the north. Average flows for each hour from 5am to 9pm were obtained by direction so that they could be grouped into counts that were either heading into or out of the Wellington CBD. Hours between 9pm and 5am were considered to be well within the overnight period and could be omitted from this analysis.

Counts were further grouped into 10km distance bands, centred on Te Papa, so as to determine if there are different flow profiles throughout the network area. The bands used were; 0-10km, 10-20km, 20-30km and greater than 30km radiating out from Te Papa.

For each hour, distance band and direction; the individual counts were totalled to provide four overall distance band flow profiles from 5am to 9pm. These overall distance band profiles were converted into hourly percentage profiles by dividing each hourly flow by the total flow within each distance band.

3. Analysis

3.1 Flow Results

Table 3-1 details the hourly percentage breakdown of surveyed flow inbound to the Wellington CBD for each distance band. Table 3-2 details the hourly percentage breakdown of flow outbound from the Wellington CBD. Full percentage breakdowns for all of the survey locations are shown in Appendix A.

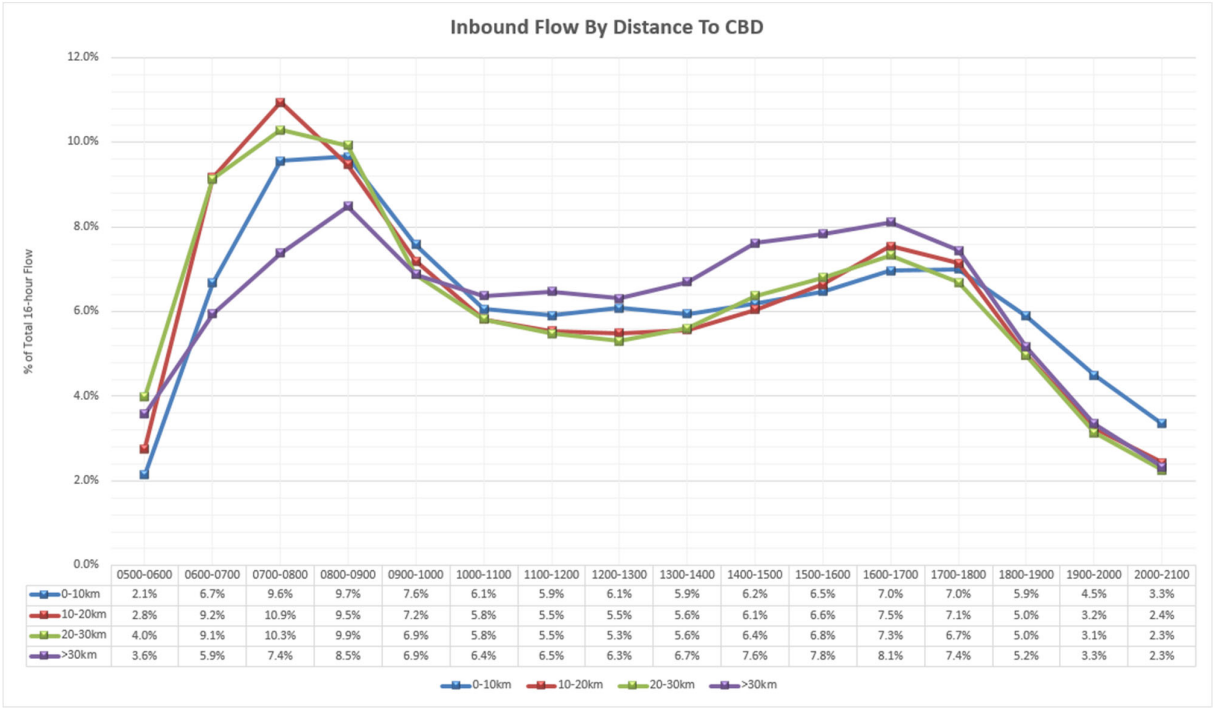
Table 3-1: Hourly Inbound Flow Profiles, Traffic Counts

Distance from CBD	Hour Starting															
	5am	6am	7am	8am	9am	10am	11am	12am	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm
0-10km	2.1 %	6.7 %	9.6 %	9.7 %	7.6 %	6.1 %	5.9 %	6.1 %	5.9 %	6.2 %	6.5 %	7.0 %	7.0 %	5.9 %	4.5 %	3.3 %
10-20km	2.8 %	9.2 %	11.0 %	9.5 %	7.2 %	5.8 %	5.5 %	5.5 %	5.6 %	6.0 %	6.6 %	7.5 %	7.1 %	5.0 %	3.2 %	2.4 %
20-30km	4.0 %	9.1 %	10.3 %	9.9 %	6.9 %	5.8 %	5.5 %	5.3 %	5.6 %	6.4 %	6.8 %	7.3 %	6.7 %	5.0 %	3.1 %	2.3 %
>30km	3.6 %	5.9 %	7.4 %	8.5 %	6.9 %	6.4 %	6.5 %	6.3 %	6.7 %	7.6 %	7.8 %	8.1 %	7.4 %	5.2 %	3.3 %	2.3 %

Table 3-2: Hourly Outbound Flow Profiles, Traffic Counts

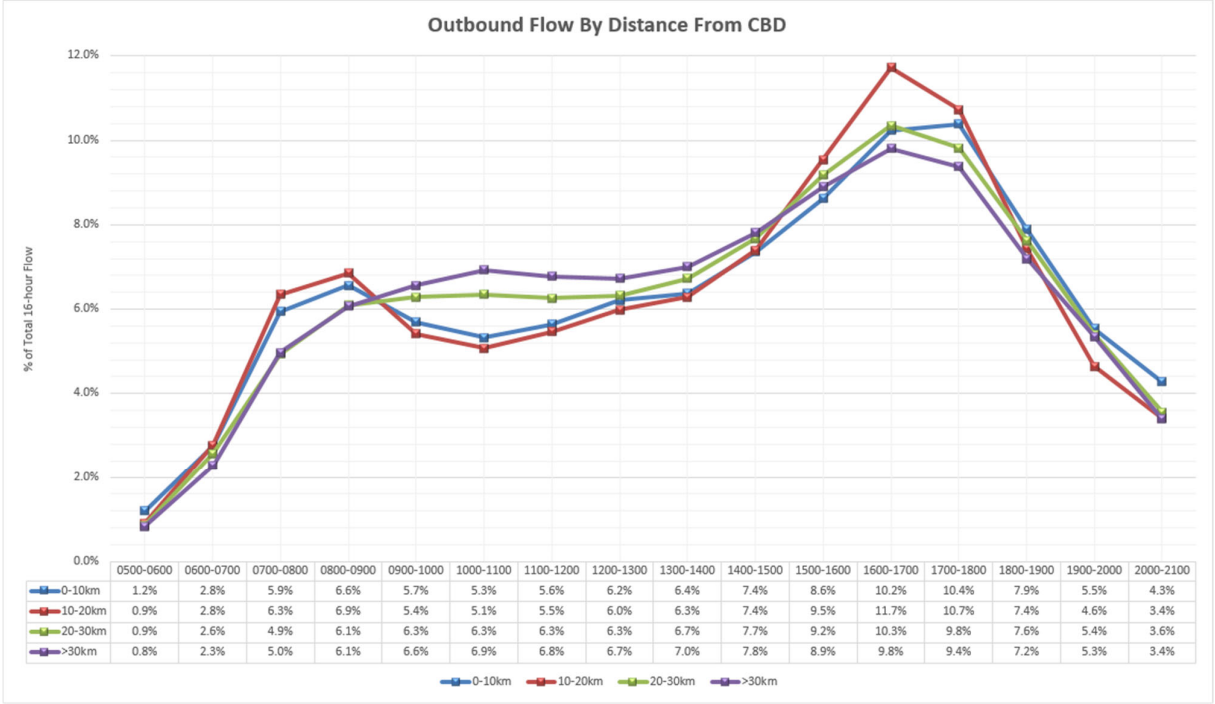
Distance from CBD	Hour Starting															
	5am	6am	7am	8am	9am	10am	11am	12am	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm
0-10km	1.2 %	2.8 %	5.9 %	6.6 %	5.7 %	5.3 %	5.6 %	6.2 %	6.4 %	7.4 %	8.6 %	10.2 %	10.4 %	7.9 %	5.5 %	4.3 %
10-20km	0.9 %	2.8 %	6.3 %	6.9 %	5.4 %	5.1 %	5.5 %	6.0 %	6.3 %	7.4 %	9.5 %	11.7 %	10.7 %	7.4 %	4.6 %	3.4 %
20-30km	0.9 %	2.6 %	4.9 %	6.1 %	6.3 %	6.3 %	6.3 %	6.3 %	6.7 %	7.7 %	9.2 %	10.3 %	9.8 %	7.6 %	5.4 %	3.6 %
>30km	0.8 %	2.3 %	5.0 %	6.1 %	6.6 %	6.9 %	6.8 %	6.7 %	7.0 %	7.8 %	8.9 %	9.8 %	9.4 %	7.2 %	5.3 %	3.4 %

These profiles are shown graphically in the following Figure 3-1 and Figure 3-2 respectively.



	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100
0-10km	2.1%	6.7%	9.6%	9.7%	7.6%	6.1%	5.9%	6.1%	5.9%	6.2%	6.5%	7.0%	7.0%	5.9%	4.5%	3.3%
10-20km	2.8%	9.2%	10.9%	9.5%	7.2%	5.8%	5.5%	5.5%	5.6%	6.1%	6.6%	7.5%	7.1%	5.0%	3.2%	2.4%
20-30km	4.0%	9.1%	10.3%	9.9%	6.9%	5.8%	5.5%	5.3%	5.6%	6.4%	6.8%	7.3%	6.7%	5.0%	3.1%	2.3%
>30km	3.6%	5.9%	7.4%	8.5%	6.9%	6.4%	6.5%	6.3%	6.7%	7.6%	7.8%	8.1%	7.4%	5.2%	3.3%	2.3%

Figure 3-1: Inbound Flow Profiles, Traffic Counts



	0500-0600	0600-0700	0700-0800	0800-0900	0900-1000	1000-1100	1100-1200	1200-1300	1300-1400	1400-1500	1500-1600	1600-1700	1700-1800	1800-1900	1900-2000	2000-2100
0-10km	1.2%	2.8%	5.9%	6.6%	5.7%	5.3%	5.6%	6.2%	6.4%	7.4%	8.6%	10.2%	10.4%	7.9%	5.5%	4.3%
10-20km	0.9%	2.8%	6.3%	6.9%	5.4%	5.1%	5.5%	6.0%	6.3%	7.4%	9.5%	11.7%	10.7%	7.4%	4.6%	3.4%
20-30km	0.9%	2.6%	4.9%	6.1%	6.3%	6.3%	6.3%	6.3%	6.7%	7.7%	9.2%	10.3%	9.8%	7.6%	5.4%	3.6%
>30km	0.8%	2.3%	5.0%	6.1%	6.6%	6.9%	6.8%	6.7%	7.0%	7.8%	8.9%	9.8%	9.4%	7.2%	5.3%	3.4%

Figure 3-2: Outbound Flow Profiles, Traffic Counts

3.2 Travel Time Results

Tom-Tom data, for eight selected routes into and out of Wellington, was collected for a period in March 2018 for use in the model validation process. Summaries of this data were utilised to further indicate the hours of flow build-up during the peak periods. The average travel times along the eight routes were calculated for every 15-minute segment from 6am to 10am on the inbound routes to Wellington and from 3pm to 7pm on the outbound routes.

The directional travel times for each of the routes were plotted to show the individual route profiles of the increase in route delay occurring. The direction profiles are shown below in Figure 3-3 and Figure 3-4. The blue shaded areas indicate periods of elevated travel times.

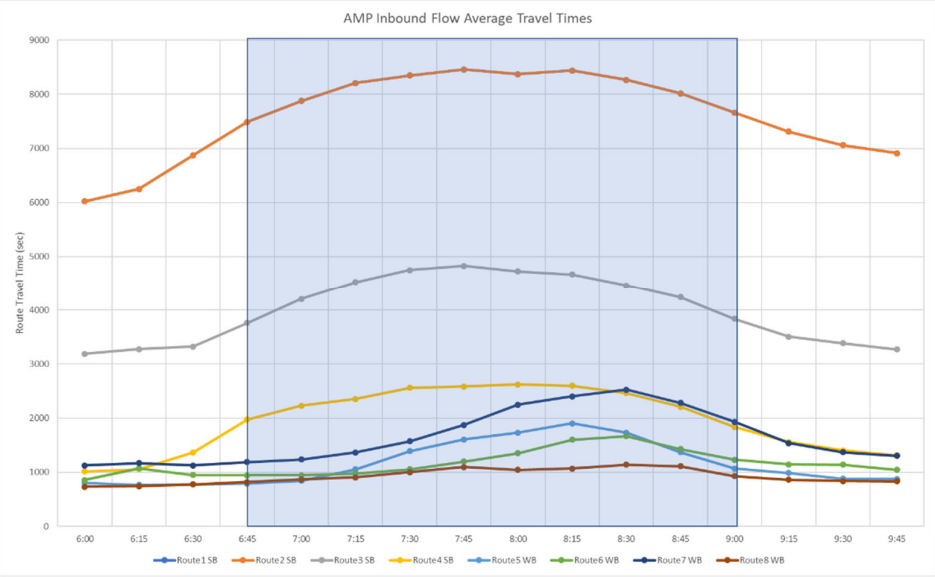


Figure 3-3: AM Peak Inbound Route Average Travel Times

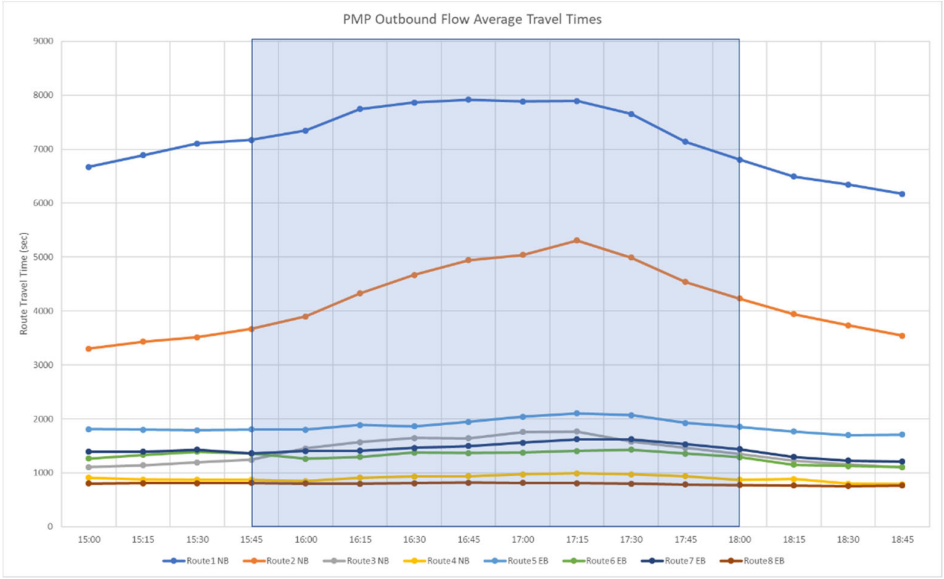


Figure 3-4: PM Peak Outbound Route Average Travel Times

3.3 Discussion

By splitting the flows by direction, the flow profiles better represent the dominant peak period flow and likely periods of congestion throughout the region. As expected, each show the distinct tidal flow profiles you would expect for each peak period. The inbound profiles peak during the 6-9am period and the outbound profiles peak during the 3-6pm period. The following subsections make specific observations for each flow direction individually.

3.3.1 Inbound Flow Direction

The following observations relate to the AM peak period:

- The 0-10km band profile shows that the peak has a two-hour period from 7-9am. However, a closer look at the counts at the dominant flow locations within this band show that peak flow conditions also occur from 6-7am at Waterloo Quay, The Terrace Interchange, SH1 south of Ngauranga, Churton Park-Grenada Interchange and SH2 north of Ngauranga with these five locations averaging over 9.5% of the 16-hour flow;
- For sites within both of the 10-20km and 20-30km bands, there is clearly a three-hour AM peak period from 6-9am. Each of the three hours has over 9.1% of the 16-hour flow (at least 2% higher than any other shoulder hour) with an average of 9.9% per hour flow over the three hours;
- The greater than 30km band indicates much lower peak period flow percentages than the other distance bands as well as only a two-hour AM peak. This may be indicative of these sites being located near to other centres of activity and therefore having a less dominant tidal pattern in the AM peak;
- There appears to be a single "shoulder" hour after the AM peak period which is not present in the hour before the AM peak;
- Inbound travel time data indicate that periods of elevated travel times start occurring before the current 7am-9am modelled AM peak period.

3.3.2 Outbound Flow Direction

The following observations relate to the PM peak period:

- Flow profiles for all distance bands appear reasonably similar and indicate a three-hour PM peak from 3-6pm;
- The 0-10km band profile is quite flat for both hours from 4-6pm. The remaining three distance bands have a peak at the 4-5pm hour, with other high flow rates between 3-4pm and 5-6pm;
- The 3-4pm hour percentages are generally lower than the other hours during the evening peak period, but all bands indicate that flows greater than 8.6% of the 16-hour total occur during this hour. Indeed, during this hour both the 10-20km and 20-30km bands indicate flow rates as high as some AM peak period flow rates;
- There are "shoulder" hours before and after the three-hour PM peak period. Each of these shoulders are between 7.2% - 7.9% of the total flow and are approximately 1% higher than the adjoining interpeak and overnight flow rates but 1.5-2.0% lower than the peak three hours;
- Outbound travel time data indicate that periods of elevated travel times start occurring before the current 4pm-6pm modelled PM peak period.

4. Recommendations

The analysis of the available counts and travel time data around the Demand Model area indicate that in order to allow for appropriate demand during the peak periods, the current Demand Model AM and PM peaks should be expanded. The following hours are therefore recommended for each of the four model periods:

AM peak – three hours 6am-9am

Interpeak – six hours 9am-3pm

PM peak – three hours 3pm-6pm

Overnight – twelve hours 6pm-6am

Appendices

Appendix A Individual Count Percent Profiles

Location	Direction	Band	Adjusted Average 0500-0600	Adjusted Average 0600-0700	Adjusted Average 0700-0800	Adjusted Average 0800-0900	Adjusted Average 0900-1000	Adjusted Average 1000-1100	Adjusted Average 1100-1200	Adjusted Average 1200-1300	Adjusted Average 1300-1400	Adjusted Average 1400-1500	Adjusted Average 1500-1600	Adjusted Average 1600-1700	Adjusted Average 1700-1800	Adjusted Average 1800-1900	Adjusted Average 1900-2000	Adjusted Average 2000-2100
Waterloo Quay	From CBD	0-10km	0.7%	2.4%	5.9%	6.4%	5.3%	4.6%	5.0%	6.3%	6.5%	7.3%	9.0%	11.3%	11.2%	8.0%	5.5%	4.6%
Featherston St	From CBD	0-10km	0.7%	2.4%	7.5%	13.7%	8.3%	5.5%	6.1%	6.5%	6.2%	6.4%	7.2%	9.6%	10.1%	5.3%	2.7%	1.8%
Molesworth St	From CBD	0-10km	0.6%	2.1%	4.9%	6.8%	6.4%	5.9%	6.6%	7.1%	6.7%	7.8%	8.2%	10.1%	10.3%	7.6%	5.0%	4.1%
Bowen St	From CBD	0-10km	1.1%	2.9%	5.5%	7.0%	6.5%	5.0%	5.5%	6.1%	5.8%	6.8%	7.2%	10.5%	10.9%	8.7%	5.6%	4.7%
The Terrace Interchange - Hawkestone	From CBD	0-10km	1.0%	2.4%	6.1%	5.5%	4.8%	4.8%	5.1%	5.8%	6.1%	7.7%	9.5%	12.1%	10.4%	8.2%	5.9%	4.5%
Kelburn Pde	From CBD	0-10km	0.6%	1.9%	4.1%	6.5%	8.3%	7.0%	6.2%	7.0%	6.7%	6.8%	6.7%	8.8%	11.0%	8.0%	5.8%	4.6%
Aro St	From CBD	0-10km	0.5%	1.5%	4.7%	6.7%	5.8%	5.3%	5.5%	5.8%	5.8%	6.7%	7.5%	9.5%	11.4%	9.0%	7.7%	6.6%
Mt Vic Tunnel - Patterson St (Sth of Ba	From CBD	0-10km	3.4%	4.8%	6.7%	6.6%	6.6%	6.4%	6.3%	6.6%	6.8%	7.1%	7.2%	7.1%	7.2%	7.0%	5.7%	4.6%
Hawker St	From CBD	0-10km	0.4%	1.3%	3.2%	4.1%	5.4%	5.6%	5.3%	5.5%	5.6%	6.3%	7.5%	10.5%	16.0%	11.2%	7.0%	4.9%
Oriental Pde	From CBD	0-10km	0.8%	3.0%	6.2%	7.0%	6.5%	5.3%	5.7%	6.6%	6.9%	7.5%	8.5%	10.2%	9.9%	7.6%	4.7%	3.6%
Ohiro Rd	From CBD	0-10km	0.4%	1.9%	7.9%	10.9%	6.4%	4.9%	4.6%	5.5%	4.9%	5.8%	7.4%	9.0%	13.1%	8.4%	5.7%	3.4%
Brooklyn Rd	From CBD	0-10km	0.5%	2.0%	3.9%	5.1%	5.5%	5.3%	5.3%	6.1%	5.6%	7.0%	7.5%	10.3%	13.5%	9.8%	6.9%	5.6%
Taranaki St	From CBD	0-10km	1.2%	3.0%	8.2%	8.9%	7.0%	5.9%	6.6%	6.4%	6.4%	7.1%	7.8%	7.4%	7.1%	6.4%	5.9%	4.7%
Tasman St	From CBD	0-10km	0.6%	2.1%	5.3%	7.7%	6.0%	5.5%	5.8%	6.4%	6.2%	6.6%	9.0%	9.6%	10.8%	8.1%	5.4%	4.8%
Adelaide Rd Nth	From CBD	0-10km	0.7%	3.3%	5.3%	6.2%	7.0%	6.8%	6.6%	6.9%	7.0%	7.4%	7.6%	8.4%	8.2%	7.3%	6.1%	5.3%
Cobham Drive	From CBD	0-10km	3.3%	4.8%	7.4%	7.1%	6.4%	5.6%	5.8%	6.2%	6.6%	6.9%	7.5%	8.2%	8.3%	6.9%	5.0%	3.9%
Moa Point Rd	From CBD	0-10km	2.3%	3.9%	6.8%	7.3%	4.7%	5.2%	6.1%	7.5%	7.4%	8.0%	7.5%	8.6%	8.9%	7.7%	4.9%	3.3%
Chaytor St	From CBD	0-10km	0.7%	1.5%	4.0%	5.3%	5.9%	5.2%	5.6%	6.1%	6.1%	6.8%	8.3%	10.9%	11.9%	9.8%	6.7%	5.3%
Birdwood St	From CBD	0-10km	0.5%	1.8%	4.0%	5.1%	4.2%	3.9%	4.6%	5.3%	6.0%	7.2%	9.4%	10.5%	15.8%	10.5%	6.2%	5.1%
Hutt Rd	From CBD	0-10km	0.7%	1.9%	4.9%	6.1%	5.2%	5.2%	5.9%	7.1%	6.9%	8.0%	8.6%	11.0%	12.0%	8.3%	4.7%	3.5%
SH1 south of Ngauranga	From CBD	0-10km	0.9%	2.1%	5.5%	5.5%	4.8%	4.7%	5.2%	5.8%	6.2%	7.6%	9.7%	11.9%	11.7%	8.1%	5.7%	4.5%
Middleton Rd	From CBD	0-10km	0.5%	3.1%	14.9%	12.6%	5.1%	4.5%	5.0%	5.1%	4.8%	6.2%	7.0%	8.5%	10.1%	6.0%	3.7%	3.1%
Churton Park - Grenada Interchange	From CBD	0-10km	1.2%	2.8%	5.2%	5.8%	5.1%	5.1%	5.3%	5.9%	6.4%	7.7%	9.6%	11.8%	11.1%	8.0%	5.2%	3.8%
SH2 N of Nga	From CBD	0-10km	1.1%	3.3%	7.2%	7.2%	5.8%	5.6%	5.9%	6.4%	6.3%	7.4%	8.8%	9.5%	9.2%	7.6%	5.1%	3.6%
Waikowhai St	From CBD	0-10km	0.5%	1.4%	4.6%	7.5%	5.8%	5.4%	5.7%	5.8%	5.8%	6.9%	9.3%	10.7%	12.7%	8.6%	5.7%	3.6%
Crawford Rd	From CBD	0-10km	1.3%	2.7%	4.8%	6.7%	5.8%	5.7%	6.1%	6.4%	6.7%	7.3%	8.8%	9.6%	10.0%	7.6%	5.9%	4.5%
Manchester St	From CBD	0-10km	0.7%	1.9%	3.9%	5.1%	4.7%	4.6%	4.8%	6.2%	6.6%	6.7%	9.4%	10.4%	12.5%	9.9%	7.2%	5.4%
Mt Albert Rd	From CBD	0-10km	0.6%	1.0%	3.6%	5.4%	4.7%	4.8%	5.0%	5.6%	5.7%	7.0%	8.3%	11.2%	13.1%	10.5%	7.6%	5.9%
Adelaide Rd	From CBD	0-10km	0.6%	1.7%	3.9%	5.5%	5.5%	5.6%	5.5%	6.3%	6.0%	7.5%	8.9%	9.9%	10.9%	9.4%	7.1%	5.6%
Happy Valley Rd	From CBD	0-10km	0.3%	1.1%	3.8%	6.2%	5.4%	5.2%	5.9%	6.1%	6.2%	7.4%	8.5%	12.1%	14.1%	9.2%	5.2%	3.4%
The Terrace Interchange - Tinakori - Nt	From CBD	0-10km	1.0%	3.1%	7.0%	8.7%	6.7%	5.7%	6.2%	6.6%	6.8%	7.5%	7.4%	7.6%	8.3%	7.0%	5.7%	4.8%
SH2 Sth of 58	From CBD	10-20km	0.8%	2.7%	6.9%	6.6%	4.9%	4.6%	4.9%	5.3%	5.8%	7.1%	9.4%	12.5%	12.1%	7.6%	4.9%	3.7%
Ewen Bridge	From CBD	10-20km	0.6%	1.6%	4.8%	7.0%	5.8%	6.0%	7.3%	7.9%	7.8%	8.8%	9.2%	10.1%	9.6%	6.5%	4.1%	2.9%
Marine Drive	From CBD	10-20km	0.5%	1.1%	3.3%	5.1%	4.8%	6.4%	6.7%	7.8%	7.5%	8.1%	8.9%	10.2%	11.4%	8.8%	5.3%	4.2%
Western Hutt Road	From CBD	10-20km	0.8%	2.8%	6.7%	6.7%	5.0%	4.6%	5.2%	5.7%	5.9%	7.1%	9.7%	12.7%	11.4%	7.8%	4.4%	3.4%
SH58	From CBD	10-20km	1.2%	5.5%	13.1%	10.1%	6.2%	4.8%	4.3%	4.3%	4.8%	5.5%	7.5%	10.6%	10.5%	6.2%	3.4%	2.1%
Main Road	From CBD	10-20km	1.4%	3.3%	6.1%	9.6%	7.2%	6.3%	6.5%	6.9%	7.0%	6.8%	9.4%	8.0%	7.7%	6.1%	4.5%	3.3%
Linden - Tawa College	From CBD	10-20km	1.0%	2.7%	5.3%	6.3%	5.4%	5.1%	5.3%	6.0%	6.6%	7.7%	9.8%	12.1%	10.7%	7.5%	4.9%	3.6%
Mana Bridge - Paremata Bridge	From CBD	10-20km	0.9%	2.2%	4.2%	5.3%	5.5%	5.5%	5.9%	6.4%	6.7%	8.3%	10.5%	11.8%	9.8%	7.9%	5.5%	3.7%
Western Hutt Road	From CBD	10-20km	0.7%	2.4%	5.9%	6.0%	4.9%	4.7%	5.3%	5.9%	6.1%	7.4%	10.1%	12.8%	11.3%	8.1%	4.7%	3.8%
Western Hutt Road - NB On Ramp	From CBD	10-20km	1.2%	4.4%	9.3%	8.9%	5.5%	4.6%	4.6%	5.0%	5.3%	6.2%	8.3%	12.4%	11.6%	7.0%	3.5%	2.3%
Furgusson Drive	From CBD	20-30km	0.5%	1.7%	3.2%	4.8%	5.1%	5.1%	5.2%	5.5%	5.9%	6.9%	9.6%	12.5%	13.2%	9.9%	6.3%	4.6%
Paekakariki Hill Road	From CBD	20-30km	1.8%	7.1%	10.1%	10.1%	7.6%	6.0%	5.7%	5.2%	5.8%	6.6%	7.9%	8.7%	8.6%	4.5%	2.4%	1.7%
Nth of Pukerua Bay - PAEKAKARIKI - T	From CBD	20-30km	0.9%	2.6%	4.3%	5.8%	5.8%	5.6%	5.6%	6.0%	6.8%	8.2%	10.3%	11.0%	8.9%	8.4%	5.9%	4.0%
Manakau - Nth of Waitohu River Bridge	From CBD	>30km	1.1%	2.7%	6.2%	6.9%	7.1%	7.2%	7.0%	6.5%	6.7%	7.5%	8.8%	9.4%	8.6%	6.1%	4.7%	3.5%
Mt Bruce	From CBD	>30km	1.1%	2.2%	5.0%	7.8%	7.9%	8.0%	7.9%	7.8%	7.5%	9.0%	8.5%	8.9%	6.9%	5.4%	3.4%	2.6%
Rimutaka Hills	From CBD	>30km	0.8%	1.9%	4.3%	4.6%	5.8%	5.9%	5.6%	5.4%	6.3%	7.1%	9.3%	12.1%	12.3%	9.5%	5.7%	3.4%
Kebble Drive - Nth of Lindale	From CBD	>30km	0.5%	1.7%	3.6%	5.4%	6.1%	6.7%	7.7%	7.9%	7.7%	9.1%	10.0%	10.3%	9.5%	6.4%	4.3%	3.1%
Elizabeth Street	From CBD	>30km	0.3%	1.5%	4.2%	4.2%	6.4%	6.1%	5.3%	6.4%	6.3%	7.3%	10.7%	10.8%	12.2%	8.6%	5.9%	3.6%
Kapiti Expressway	From CBD	>30km	0.8%	2.4%	5.1%	6.1%	6.5%	6.9%	6.6%	6.6%	7.0%	7.7%	8.7%	9.6%	9.3%	7.5%	5.8%	3.5%
Te Moana Interchange	From CBD	>30km	1.2%	3.0%	6.0%	6.7%	7.0%	7.8%	7.0%	6.4%	7.1%	7.7%	8.1%	8.5%	8.1%	6.6%	5.6%	3.3%
Te Moana Interchange - NB Off Ramp	From CBD	>30km	0.3%	1.2%	3.0%	5.0%	5.6%	5.7%	6.1%	7.3%	7.0%	7.8%	9.5%	11.2%	11.2%	8.9%	6.4%	4.0%
Waterloo Quay	To CBD	0-10km	2.1%	7.6%	10.6%	9.9%	8.0%	6.1%	5.5%	6.0%	5.4%	5.4%	6.0%	7.4%	8.0%	6.3%	3.3%	2.5%
Featherston St	To CBD	0-10km	1.3%	5.1%	9.5%	9.3%	8.2%	6.3%	6.4%	6.4%	6.3%	6.2%	7.0%	7.8%	8.3%	5.6%	3.5%	2.7%
Bowen St	To CBD	0-10km	1.3%	4.2%	10.0%	13.5%	8.7%	5.4%	5.3%	5.5%	5.1%	5.5%	6.3%	7.3%	8.5%	5.9%	4.4%	3.1%
The Terrace Interchange - Hawkestone	To CBD	0-10km	3.0%	9.1%	10.6%	8.8%	8.5%	6.6%	5.9%	5.9%	5.9%	5.7%	5.6%	6.2%	6.2%	5.1%	3.8%	2.9%
Kelburn Pde	To CBD	0-10km	0.9%	2.6%	7.5%	11.2%	8.6%	7.0%	6.5%	7.0%	6.8%	6.9%	6.9%	7.4%	6.7%	5.7%	4.7%	3.4%
Aro St	To CBD	0-10km	1.2%	3.3%	8.8%	10.7%	6.7%	5.6%	5.5%	5.5%	5.6%	6.3%	6.8%	7.5%	9.2%	7.5%	5.7%	4.1%
Mt Vic Tunnel - Patterson St (Sth of Ba	To CBD	0-10km	2.3%	4.8%	8.0%	6.6%	7.3%	6.6%	6.6%	7.2%	7.0%	7.0%	6.3%	5.0%	5.1%	7.5%	7.3%	5.5%
Hawker St	To CBD	0-10km	0.7%	2.1%	9.0%	17.4%	6.8%	5.0%	5.4%	5.2%	4.9%	5.4%	6.9%	7.7%	8.4%	6.2%	5.1%	3.7%
Oriental Pde	To CBD	0-10km	0.6%	1.8%	7.7%	12.0%	8.6%	5.1%	5.2%	5.9%	6.0%	6.0%	8.7%	9.2%	7.1%	6.6%	5.7%	3.8%
Ohiro Rd	To CBD	0-10km	0.5%	2.1%	6.9%	10.5%	5.6%	4.2%	4.7%	4.5%	4.4%	5.9%	9.0%	12.3%	12.4%	7.5%	5.7%	3.8%
Brooklyn Rd	To CBD	0-10km	1.1%	4.0%	11.3%	13.9%	7.0%	5.1%	5.2%	5.2%	5.1%	5.5%	6.9%	7.9%	7.5%	6.1%	4.7%	3.5%
Taranaki St	To CBD	0-10km	0.8%	4.5%	6.3%	6.4%	7.4%	6.7%	6.1%	6.8%	6.7%	7.4%	6.7%	7.0%	8.5%	7.6%	6.4%	4.7%
Tasman St	To CBD	0-10km	1.0%	1.9%	8.4%	16.0%	7.1%	4.5%	4.8%	5.5%	4.9%	5.4%	8.7%	11.4%	8.9%	5.0%	3.8%	2.6%
Adelaide Rd Nth	To CBD	0-10km	1.4%	3.7%	8.4%	8.8%	6.8%	6.3%	6.9%	7.0%	6.7%	7.1%	6.8%	6.4%	6.6%	6.4%	5.8%	5.0%
Cobham Drive	To CBD	0-10km	2.9%	5.1%	8.4%	4.4%	6.5%	6.6%	6.8%	7.6%	7.2%	7.6%	6.0%	4.0%	5.9%	7.7%	7.8%	5.5%
Moa Point Rd	To CBD	0-10km	0.5%	1.3%	5.3%	13.7%	6.2%	4.7%	5.5%	6.4%	6.3%	7.0%	8.8%	9.2%	8.8%	7.6%	5.4%	3.2%
Chaytor St	To CBD	0-10km	1.4%	4.5%	12.1%	11.8%	7.0%	6.0%	6.1%	6.1%	5.6%	6.2%	6.5%	6.1%	5.9%	6.0%	4.9%	3.6%
Birdwood St	To CBD	0-10km	0.9%	4.0%	15.5%	12.5%	7.0%	5.4%	4.8%	4.6%	5.1%	5.5%	7.8%	6.7%	6.7%	6.4%	4.8%	2.2%
Hutt Rd	To CBD	0-10km	1.8%	5.7%	13.0%	14.4%	8.5%	5.8%	6.0%	6.0%	6.1%	5.5%	5.7%	6.0%	5.9%	4.6%	3.0%	1.9%
SH1 south of Ngauranga	To CBD	0-10km	3.2%	10.6%	11.0%	10.0%	7.6%	5.9%	5.5%	5.5%	5.3%	5.4%	5.7%	6.8%	6.3%	5.0%	3.4%	2.7%
Middleton Rd	To CBD	0-10km	0.6%	3.4%	10.5%	11.5%	6.6%	5.8%	5.6%	5.7%	5.9%	6.2%	8.5%	8.2%	8.2%	6.3%	4.4%	2.4%
Churton Park - Grenada Interchange	To CBD	0-10km	3.3%	10.3%	8.8%	8.1%	7.7%	6.3%	6.2%	6.0%	5.9%	6.3%	6.6%	7.0%	6.5%	5.2%	3.3%	2.7%
SH2 N of Nga	To CBD	0-10km	2.5%	8.4%	9.1%	8.5%	7.5%	6.2%	5.9%	6.0%	6.1%	6.2%	6.3%	7.9%	7.9%	5.2%	3.5%	2.8%
Waikowhai St	To CBD	0-10km	0.5%	2.2%	9.2%	13.2%	7.2%	5.1%	5.5%	5.4%	5.3%	7.1%	7.3%	8.7%	9.3%	6.5%	4.6%	2.9%
Crawford Rd	To CBD	0-10km	1.0%	2.8%	6.8%	9.2%	6.4%	5.6%	5.9%	6.3%	6.1%	6.9%	7.9%	8.0%	8.6%	7.6%	6.5%	4.5%
Manchester St	To CBD	0-10km	0.7%	2.7%	10.0%	15.7%	6.6%	4.7%	5.2%	4.8%	4.8%	5.6%	6.7%	7.9%	8.8%	6.7%	4.8%	4.2%
Mt Albert Rd	To CBD	0-10km	1.4%	4.3%	12.9%	15.6%	7.7%	5.2%	4.7%	4.9%	4.1%	5.1%	6.1%	5.7%	7.3%	6.7%	4.8%	3.7%
Adelaide Rd	To CBD	0-10km	1.3%	3.8%	9.8%	10.9%	7.1%	5.7%	5.7%	6.0%	5.4%	6.2%	7.2%	7.0%	6.8%	7.0%	5.9%	4.0%
Happy Valley Rd	To CBD	0-10km	0.7%	3.0%	9.6%	11.9%	6.2%	5.0%	5.6%	5.3%	5.5%	6.2%	8.4%	9.8%	9.1%	6.3%	4.5%	2.7%
The Terrace Interchange - Hawkestone	To CBD	0-10km	1.4%	3.3%	9.6%	14.7%	8.3%	5.7%	6.0%	6.5%	6.0%	6.6%	6.6%	6.7%	5.7%	5.4%	4.4%	3.0%
SH2 Sth of 58	To CBD	10-20km	2.6%	9.8%	12.1%	9.8%	7.4%	5.7%	5.4%	5.2%	5.2%	5.5%	6.2%	7.8%	7.3%	4.9%	3.1%	2.0%
Marine Drive	To CBD	10-20km	1.2%	5.9%	9.2%	10.4%	8.3%	8.0%	7.2%	7.2%	7.0%	7.4%	6.6%	6.7%	5.7%	4.1%	3.0%	2.0%
Western Hutt Road	To CBD	10-20km	3.1%	10.3%	12.4%	10.1%	7.2%	5.7%	5.3%	5.2%	5.3%	5.6%	6.2%	7.2%	6.9%	4.5%	2.8%	2.1%
SH58	To CBD	10-20km	1.4%	4.7%	11.0%	10.8%	5.9%	4.7%	4.4%	4.5%	5.0%	6.1%	7.8%	10.9%	11.2%	6.0%	3.3%	2.4%
Main Road	To CBD	10-20km	0.8%	2.8%	7.6%	9.1%	6.0%	5.5%	6.0%	6.3%	6.4%	7.7%	8.7%	9.5%	9.2%	6.2%	4.6%	3.4%
Linden - Tawa College	To CBD	10-20km	3.6%	11.4%	10.0%	7.2%	7.5%	5.8%	5.6%	5.7%	5.8%	6.3%	6.6%	6.6%	6.6%	5.1%	3.4%	2.8%
Mana Bridge - Paremata Bridge	To CBD	10-20km	3.1%	9.2%	9.3%	10.2%	7.9%	6.6%	6.2%	6.0%	5.9%	6.3%	6.3%	6.5%	5.2%	5.1%	3.5%	2.7%
Western Hutt Road	To CBD	10-20km	3.6%	11.5%	11.7%	9.5%	7.2%	6.0%	5.6%	5.4%	5.5%	5.8%	6.1%	6.6%	6.2%	4.3%	2.8%	2.2%
Western Hutt Road - SB Off Ramp	To CBD	10-20km	1.3%	6.5%	14.5%	12.0%	7.0%	4.7%	4.6%	4.5%	4.8%	5.3%	6.5%	9.3%	9.1%	5.2%	2.8%	1.8%
Furgusson Drive	To CBD	20-30km	3.2%	9.9%	12.3%	10.7%	6.3%	5.8%	5.3%	5.1%	5.3%	6.3%	6.2%	6.2%	5.8%	5.3%	3.7%	2.4%
Paekakariki Hill Road	To CBD	20-30km	1.4%	4.0%	6.3%	8.7%	6.6%	5.4%	5.5%	5.3%	5.8%	7.9%	9.8%	12.0%	10.0%	6.0%	3.3%	1.9%
Nth of Pukerua Bay - PAEKAKARIKI - T	To CBD	20-30km	5.6%	10.3%	10.0%	9.7%	7.5%	6.0%	5.6%	5.5%	5.8%	5.9%	6.2%	6.5%	6.2%	4.3%	2.6%	2.3%
Manakau - Nth of Waitohu River Bridge	To CBD	>30km	3.2%	5.1%	6.3%	7.5%	6.0%	6.0%	6.3%	6.4%	7.0%	7.8%	8.6%	9.1%	8.5%	5.8%	3.7%	2.6%
Mt Bruce	To CBD	>30km	1.6%	2.2%	4.2%	6.2%	6.4%	7.9%	8.4%	7.8%	8.1%	9.1%	9.3%	8.5%	8.8%	5.2%	3.8%	2.6%
Rimutaka Hills	To CBD	>30km	4.0%	10.7%	9.8%	7.7%	7.1%	6.6%	5.9%	5.7%	6.2%	6.7%	7.0%	7.5%	6.5%	4.5%	2.5%	1.7%
Kebble Drive - Nth of Lindale	To CBD	>30km	2.6%	4.2%	6.6%	10.1%	8.7%	7.7%	7.5%	7.1%	7.0%	8.1%	7.8%	7.1%	6.3%	4.4%	3.0%	2.0%
Elizabeth Street	To CBD	>30km	2.6%	5.0%	9.7%	12.3%	7.7%	6.1%	5.9%	5.8%	7.0%	7.3%	6.7%	7.0%	6.7%	5.3%	2.7%	2.2%
Kapiti Expressway	To CBD	>30km	4.0%	6.2%	7.7%	8.6%	6.8%	6.1%	6.3%	6.1%	6.5%	7.5%	7.7%	8.1%	7.4%	5.2%	3.4%	2.4%
Te Moana Interchange	To CBD	>30km	4.0%	5.9%	7.0%	7.5%	6.1%	5.9%	6.0%	6.0%	6.5%	7.7%	8.0%	9.0%	8.6%	5.7%	3.5%	2.6%
Te Moana Interchange - SB On Ramp	To CBD	>30km	4.1%	6.8%	8.9%	10.5%	7.9%	6.5%	6.8%	6.3%	6.5%	7.2%	7.0%	6.6%	5.4%	4.4%	3.2%	2.0%

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