Auckland Dynamic Traffic Assignment Model

Model Development Report

Prepared by:

Auckland Forecasting Centre

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EXCELLENCE IN TRANSPORT FORECASTING

An Auckland Council, NZ Transport Agency
and Auckland Transport Partnership

Change History and Approval

Approval indicates an understanding of the purpose and content described in this document. By signing this document each individual agrees work should be initiated on this project and necessary resources should be committed as described herein.

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Executive Summary

This report details the development and calibration/validation of the Auckland Dynamic Traffic Assignment Model (ADTA). The purpose of the model is to 1) improve regional traffic modelling capability and 2) provide a consistent and common basis for project model development for the region, facilitating the planning and decision making process.

The base year 2016 model covers three weekday time periods (6am – 10am, 11am – 1pm, and 3pm – 7pm). The four-hour periods for AM and PM peak periods were chosen to capture the prolonged congestion experienced across the Auckland region.

The model consists of macro and meso tiers with respective assignment methods: static assignment and meso dynamic traffic assignment (DTA). The macro tier provides an interim stage to calibrate the demand through demand adjustment and to generate the initial set of paths for the meso DTA. The meso tier provides the ultimate platform for analyses and reporting.

Due to its sheer scale, the model was developed with an underpinning development philosophy of systematicity. This was achieved through well-defined, automated processes at every stage of the model development.

Various observed data were collected and processed by Auckland Forecasting Centre (AFC) for this model development. These included traffic counts, travel times, park and ride survey data, public transport boarding data, bus service operation data, signal timing, on-street signage information for transit and bus lanes and Census Journey to Work (JTW) data.

The model network was developed in line with the ADTA network coding guideline, which sets out the recommended network coding methodology to ensure consistency. A number of bespoke processes were developed for classifying and labelling different turn movement types, keeping records of network adjustments, handling of time-dependent operations, and coding of bus services and signal control plans.

The initial traffic demands came from the newly updated Macro Strategic Model (MSM 2016). These underwent a series of modifications before being assigned in the meso DTA, including disaggregation of the MSM demands into ADTA zones; applying 2-to-4-hour expansion; adjusting Home-Based-Work matrices based on Census JTW data;, incorporating park and ride trips; demand OD adjustment using static assignment; profiling using an external profiling model; and segmentation by vehicle occupancy.

Throughout the development process, emphasis was put on the model response and its ability to forecast. This meant each of the static assignment and meso DTA stages were calibrated based on the observed behaviours, or calibrated microscopic model behaviours, based on a consistent set of rules, with care taken not to overfit the model.

Model validation was undertaken based on the traffic counts and travel times across the region. These show the model only meets the some validation target criteria. It underrepresents some of the bottlenecks on motorways.

A test scenario was created to check the model's response to network changes, using the recently completed Waterview Connection project. Results from this test suggests that the model responses are reasonable and satisfactory for a regional scale model.

Despite some deficiencies in the model validation, the resulting base model is considered sufficient to meet its purpose and functional requirements as the regional DTA model, providing a consistent platform for regional scale traffic and project model evaluation.

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List of Abbreviations

ABBREVIATION	
AADT	Annual Average Daily Traffic
AC	Auckland Council
ADTA	Auckland Dynamic Traffic Assignment (model)
AFC	Auckland Forecasting Centre
ATOC	Auckland Transport Operations Centre
AT	Auckland Transport
CMJ	Central Motorway Junction
DCF	Dynamic Cost Function
DUE	Dynamic User Equilibrium
DTA	Dynamic Traffic Assignment
EB	Employers Business (trip purpose)
ERUC	Electronic Road User Charge Management System
GEH	Geoffrey E. Havers (model validation statistics invented by Geoffrey E. Havers)
GNR	Great North Road
GPS	Global Positioning System
GTFS	General Transit Feed Specification
HBE	Home-Based-Education (trip purpose)
HBO	Home-Based-Other (trip purpose)
HBSH	Home-Based-Shopping (trip purpose)
HBW	Home-Based-Work (trip purpose)
HCM	Highway Capacity Manual
JDF	Junction Delay Function
JTW	Journey to Work
ME	Matrix Estimation
MPT	Macro Passenger transport (model)
MSA	Method of Successive Averaging
MSM	Macro Strategic Model
NHBO	Non-Home-Based-Other (trip purpose)
NZTA	New Zealand Transport Agency
OD	Origin-Destination
PCU	Passenger Car Unit
PNR	Park and Ride
PT	Public Transport

RAMM	Road Assessment and Maintenance Management
RGAP	Relative Gap
SCATS	Sydney Coordinated Adaptive Traffic System
SH	State Highway
SRC	Stochastic Route Choice
TMS	Traffic Monitoring System
TPF	Turn Penalty Function
VDF	Volume Delay Function

1 Introduction

1.1 Model Purpose

With the recent growth in Auckland and the subsequent increase in demand for transport infrastructure improvement, there have been increasing reasons for the development of a regional Dynamic Traffic Assignment (DTA) model for Auckland.

The model is intended to address the limitations with traditional static traffic models and multiple, inconsistent project specific models, with the following two main purposes:

- To represent sufficient operational network details including time-varying elements across the Auckland region in a single model
- To provide a consistent and common platform for operational traffic modelling in the Auckland region.

1.2 Report Purpose

This report documents the model development, calibration and validation of the Auckland Dynamic Traffic Assignment (ADTA) model, representing 2016 weekday travel.

1.3 Report Structure

The reminder of this report is structured as follows:

Chapter 2	Details the model structure and development methodology
Chapter 3	Outlines the sources and usage of the input data for the model
Chapter 4	Provides details on the network representation
Chapter 5	Describes steps taken to prepare the demand for the meso DTA
Chapter 6	Provides details on the calibration process for static assignment
Chapter 7	Provides details on the calibration process for meso DTA
Chapter 8	Presents the calibration and validation results including Waterview Connection test results
Chapter 9	Evaluates the model functionality against the original proposal and discusses future developments
Chapter 10	Draws conclusions on the model development

A number of reports and technical notes have been written over the course of the project. These are detailed and can be provided on request.

2 Model Development Methodology

2.1 Model Structure

2.1.1 Regional Modelling Context

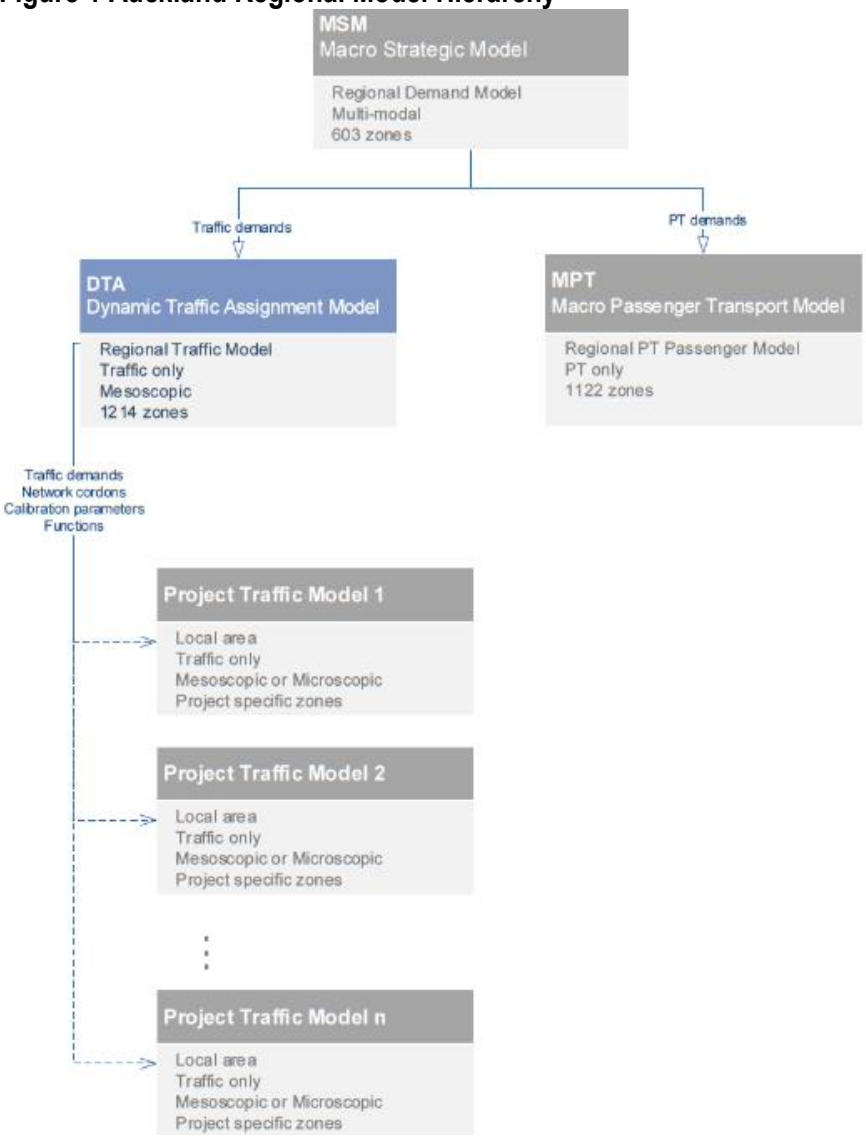
The Macro Strategic Model (MSM) is a higher order multi-modal transport demand model for the Auckland region. This model provides coarse vehicle and public transport assignments, with the primary purpose of understanding future transport demands.

The Macro Public Transport Model (MPT) provides a more detailed public transport assignment for forecasting future public transport patronage.

The ADTA model will similarly provide a more detailed vehicle assignment for region-wide dynamic traffic analysis. Lower order (child) models will be formed by adding increased detail in specific areas for individual projects at a mesoscopic or microscopic level, either directly using the ADTA model or by extracting subareas from the DTA model for further refinement.

Figure 1 provides a summary of the model hierarchy and interactions.

Figure 1 Auckland Regional Model Hierarchy

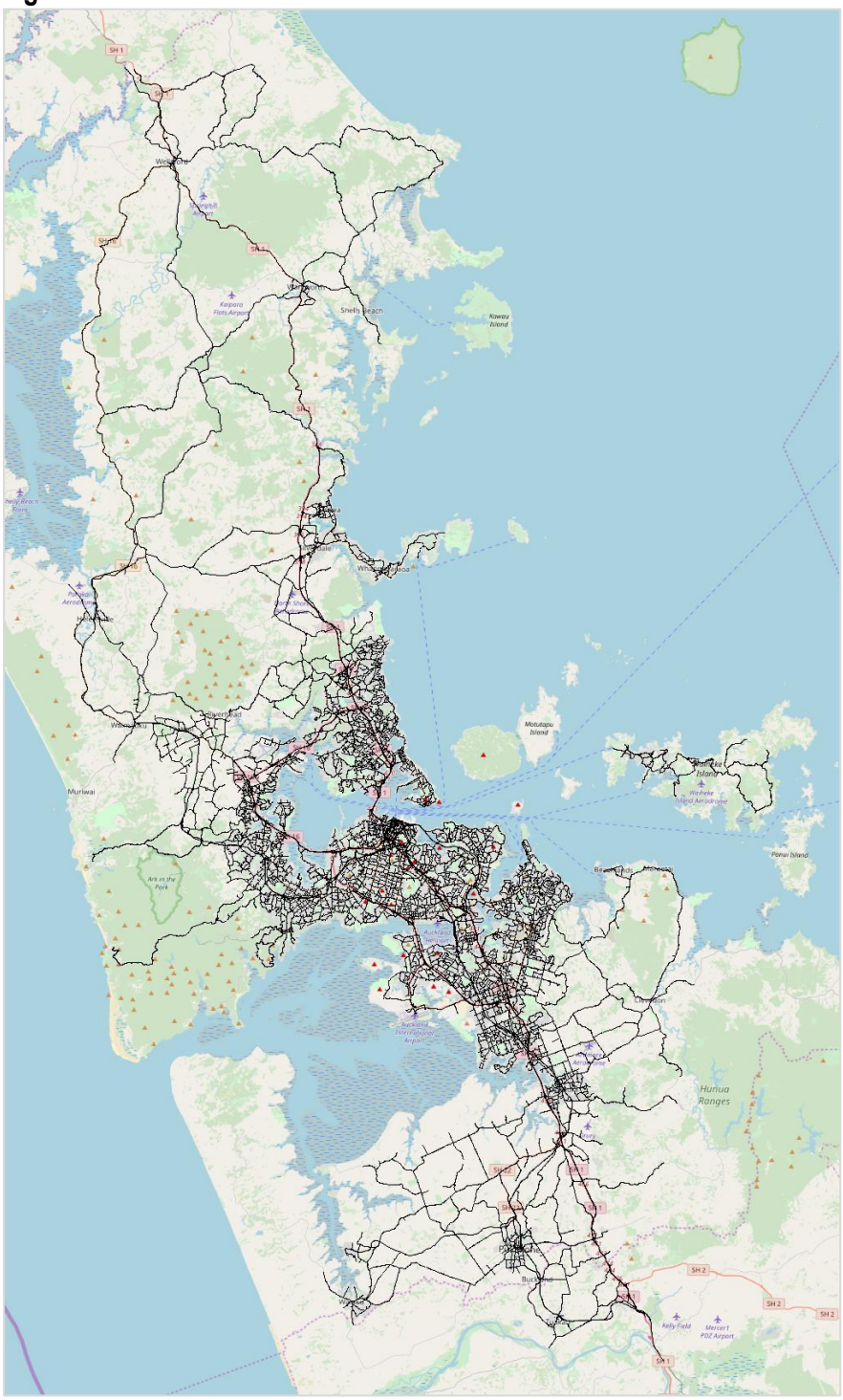


2.1.2 Model Extent

The ADTA model covers the same extent as the MSM, i.e. the entire Auckland Council region, encompassing Pukekohe to the south and Warkworth to the north, approximately 140 km in length. This enables a direct linkage with the travel demand forecasts from the MSM.

Two zones in the south outside the Auckland Council region (Tuakau and Pokeno) are also included in both the MSM and ADTA due to their proximity and interaction with Auckland.

Figure 2 Model Extent



2.2 Modelling Platform

The ADTA model was developed in the Aimsun transport modelling software (Version 8.2 R53333).

The model consists of macro and meso tiers which use static and meso dynamic traffic assignment (DTA) respectively. The macro tier provides an interim stage to calibrate the demand through demand adjustment and to generate the initial set of paths for the meso DTA. The meso DTA uses the dynamic user equilibrium (DUE) is the main platform for analyses and reporting.

Due to model run-time implications, the ADTA does not include the lower micro-simulation tier at the regional level. However, multi-tier functionality available in Aimsun provides the flexibility to generate a standalone mesoscopic or micro-simulation subarea model, or even a combination of the two, in specific locations for projects as required.

2.3 Model Specification

2.3.1 Model Reference Date

The reference date for the base ADTA model is 8-10 March 2016 (Tuesday – Thursday in the second week of March). This date range was selected to capture the typical mid-week traffic conditions, free of effects of school holidays or public holidays.

2.3.2 Model Time Periods

The ADTA model includes three model periods as shown below:

MODEL PERIOD	DESCRIPTION
AM PEAK	Weekday 6am – 10am (4-hour) Plus 45-minute warm up
INTER-PEAK	Weekday 11am – 1pm (2-hour) Plus 45-minute warm up
PM PEAK	Weekday 3pm – 7am (4-hour) Plus 45-minute warm up

In Auckland, the AM and PM peak periods are characterised by prolonged peak traffic conditions due to long travel distances and heavy congestion across the network. As such, both peak periods required 4-hour durations to adequately assign long distance travel demands and reflect the build-up of peak traffic conditions.

The inter-peak period was set to two hours as the traffic conditions were found to be stable between 10am and 3pm.

2.3.3 Vehicle Classification

The ADTA model uses the following three vehicle classes in the meso DTA.

VEHICLE CLASS	
CAR - SOV	Car - Single Occupancy Vehicle Private cars with single occupant
CAR - HOV	Car - High Occupancy Vehicle Private cars with two or more occupants
TRUCK	Medium and heavy commercial vehicles

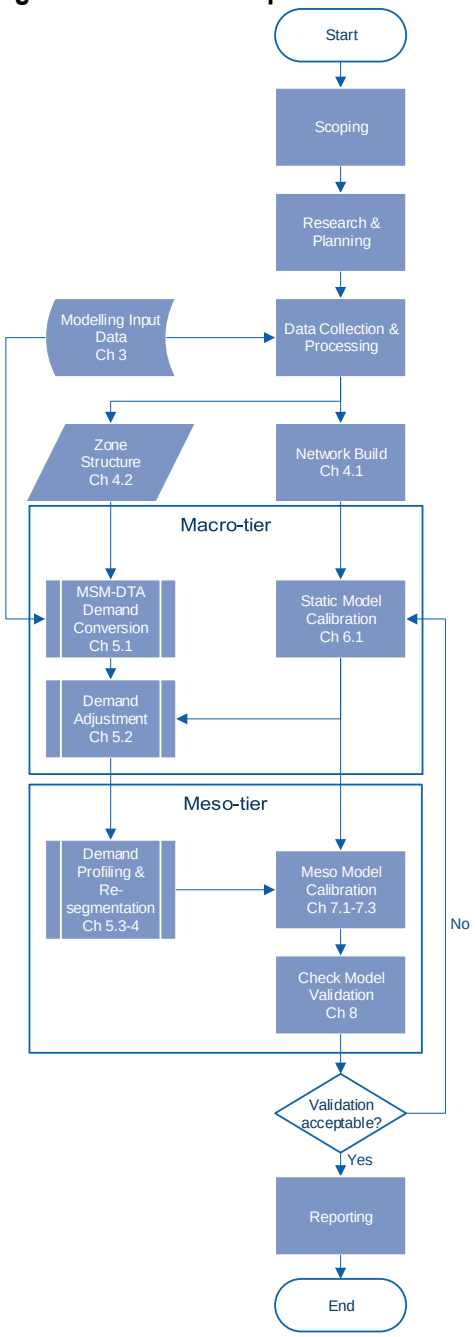
The segmentation of private vehicles into SOVs and HOVs was necessary to reflect the additional route choices available to HOVs via transit lanes. The original intention was to split the Car – HOV further into T2 and T3+ occupancies to match the existing transit lane classification. However, this was not implemented because of convergence issues experienced with the initial meso DTA runs that required the number of vehicle classes to be kept at minimum. In March 2016, Onewa Road was the only corridor with the T3+ lanes, hence impacts of combining the T2 and T3+ are considered localised and minor. The benefits from improved accuracy with an additional vehicle class did not outweigh the delays in the development process associated with convergence issues and increased run-times.

2.4 Development Approach

A summary of the model development workflow is shown in **Figure 3** below. Further details are provided in later chapters.

With the sheer scale of the regional model, it was obvious that any manual coding or checks would quickly become cumbersome. The fundamental development principle was to employ systematic and consistent processes at every stage of the model development, making full use of scripting and automation both inside and outside Aimsun. This helped minimise human errors and inconsistencies, and improve efficiency.

Figure 3 ADTA Development Workflow



3 Modelling Input Data

This chapter provides a summary of various input data that were collated and processed to develop the ADTA model.

3.1 Summary of Data

DATA	PROVIDED BY
NETWORK	
▪ **ROAD CENTRELINE GIS**	AC GIS
▪ **AT ROAD HIERARACHY GIS**	AT GIS
▪ **GEOREFERENCE AERIAL PHOTOGRAPHS**	AC GIS
OBSERVED TRAFFIC COUNTS	
▪ **SCATS**	ATOC
▪ **AT TUBE**	AT Assets
▪ **TMS**	NZTA
OBSERVED TRAVEL TIMES	
▪ **SNITCH**	AT Operations and Performance
▪ **TOMTOM**	NZTA
CLEARWAY & TRANSIT LANE DATA	
▪ **RAMM – SIGN LAYER**	AT Assets
SIGNAL CONTROL DATA	
▪ **SCATS PHASING & TIMING**	ATOC
▪ **RAMP SIGNAL TIMING**	ATOC
PUBLIC TRANSPORT DATA	
▪ **GTFS**	AT Metro
▪ **BUS STOP LOCATIONS**	AT GIS
▪ **BUS ROUTES, ARRIVAL TIMES, DWELL TIMES**	AT Data Warehouse
▪ **RAILWAY LEVEL CROSSING DATA**	AT Strategic Rail Development
▪ **NUMBER OF BOARDINGS**	AT Data Warehouse
MSM INPUTS	AFC
▪ **TRAFFIC DEMANDS BY TRIP PURPOSE (IN VEHICLES)**	
▪ **HBW CAR TRIPS (IN PERSONS)**	
▪ **CAR TRAVEL TIME SKIM MATRICES**	

2013 CENSUS AND DEMOGRAPHICS DATA ▪ **LAND USE DATA** ▪ **BUSINESS DEMOGRAPHIC DATA** ▪ **JOURNEY TO WORK (JTW)**	Statistics NZ
PARK AND RIDE (PNR) DATA	AT Transport Sustainability
VEHICLE OCCUPANCY DATA	AT Operations and Performance

3.2 Description of Data

3.2.1 Network

Road centreline and road hierarchy GIS files were joined in GIS then imported into Aimsun software using the built-in GIS Import functionality to form the initial skeleton road network. This was further refined manually based on georeferenced aerial photographs. This process is detailed in Chapter **4.1.1**.

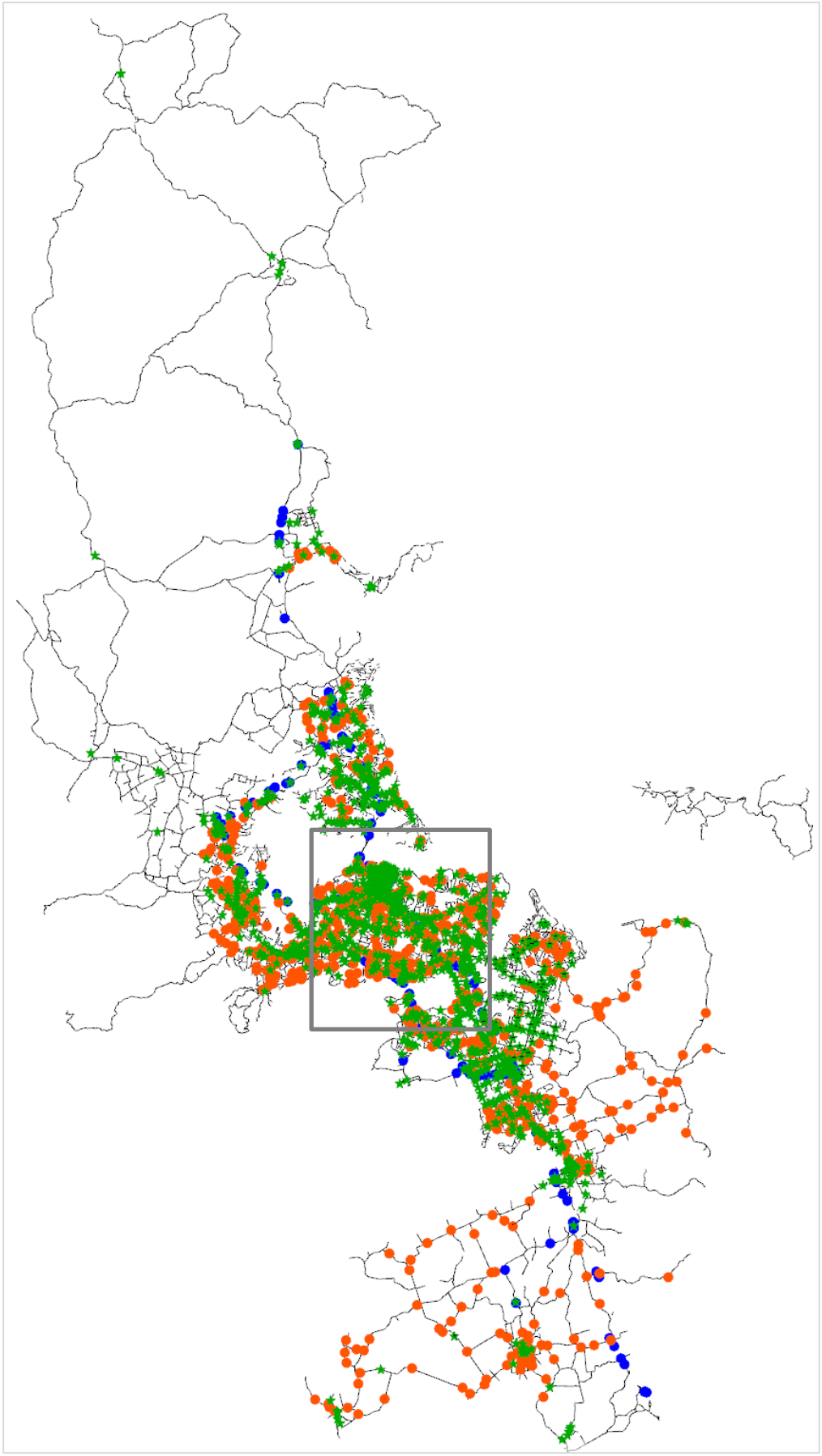
3.2.2 Observed Traffic Counts

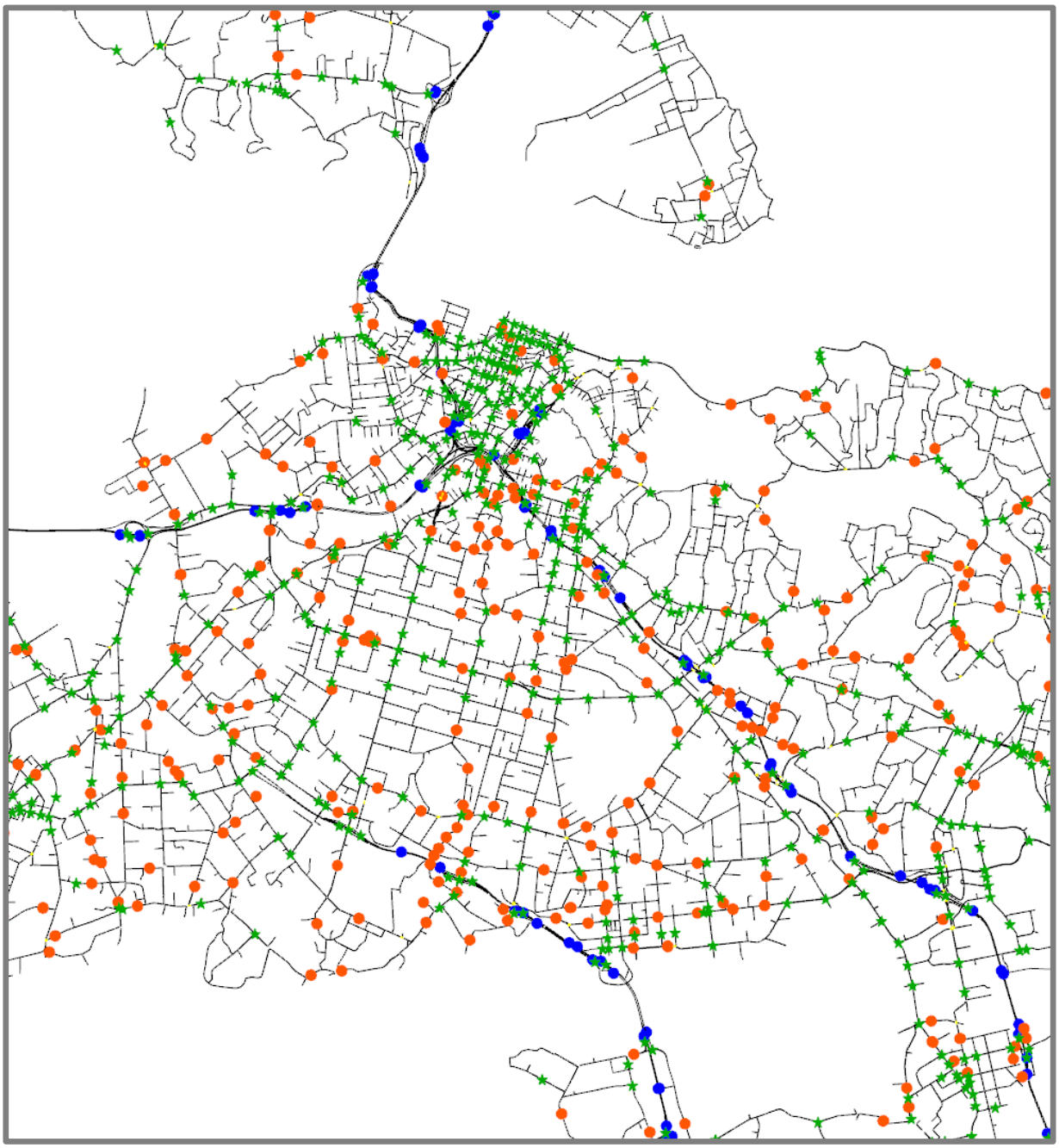
Various data types for observed traffic counts and their characteristics are summarised below.

DATA TYPES	DATE RANGE	CLASSIFIED?	DESCRIPTION
SCATS	9 March 2016	No	Collected by detectors at each signalised intersection on local roads, and also at ramp metering sites on motorway ramps
AT TUBE	Various. March 2015 – September 2016	Yes	Collected at selected mid-block tube stations on local roads
TMS	9 March 2016 where possible, otherwise the closest mid-week free of holidays	Mixed	Collected at NZTA's monitoring sites on motorways and state highways

Error! Reference source not found.**Figure 4** shows the counts locations by data types.

Figure 4 Traffic Counts Locations (SCATS in green, AT Tube in orange and TMS in blue)





Overlapping data sources meant that multiple traffic count records were available at some locations. The quality of data varied vastly between the data points and data types, and required network-wide verification.

Traffic count verification was undertaken in Excel for the entire region. The traffic flow on each link was calculated by adding incoming counts and outgoing counts to determine those count records that aligned and were considered likely to be accurate. This was used to verify and rate the quality of the traffic count records. A reliability rating[1] between 1 and 10 was set for each count record in the Aimsun Real Data Sets, where 10 was considered most reliable.

[1] Reliability ratings are confidence weightings for observed count records that allow the built in Aimsun demand adjustment process to prioritise counts with a higher reliability rating.

3.2.3 Observed Travel Times

Snitch and TomTom travel time data was used in model development. Both providers collect travel times using GPS tracking devices on vehicles. Data available from Snitch is more limited as their sample is collected through a commercial fleet management system. TomTom covers a wider range of users through their own App and navigation devices as well as data from partner organisations such as Apple and Uber.

However, because the current license arrangement with TomTom puts a restriction on total number of queries allowed, Snitch data was used as the primary data source for travel times, with gaps being filled by TomTom data where necessary. A total of 94 pre-defined Snitch travel time routes were identified as the key routes to be used in the ADTA model validation process (detailed further in **Chapter 0**). These cover the motorway network and major arterials as shown in **Figure 5**.

Each travel time route consists of multiple segments, typically defined between major intersections, The Snitch sample size and data quality was checked for each segment and each hourly period[2]. For those segments where the Snitch data appeared unreliable, additional travel time data was extracted from the TomTom database to replace the Snitch data.

To obtain a good sample size, hourly travel times for general traffic were extracted from both data sources, for all Tuesdays-Thursdays in March 2016.

3.2.4 Clearway & Transit Lane Data

The Sign layer in AT's Road Assessment and Maintenance Management (RAMM) system provides details on road signs on local roads across the region, including their location, type and the wording on the sign. This information was used to facilitate coding of region-wide time-dependent operations such as clearways and transit lanes, as detailed in **Chapter 4.1.5**.

3.2.5 Public Transport Data

General Transit Feed Specification (GTFS) data from March 2016, combined with bus operation records available in AT's Data Warehouse and a bus stop location GIS layer, provided comprehensive information on bus stop locations, bus routes, frequencies, and bus arrival and dwell times at each bus stop. These provided inputs for bus service coding, as detailed in **Chapter 4.1.6**.

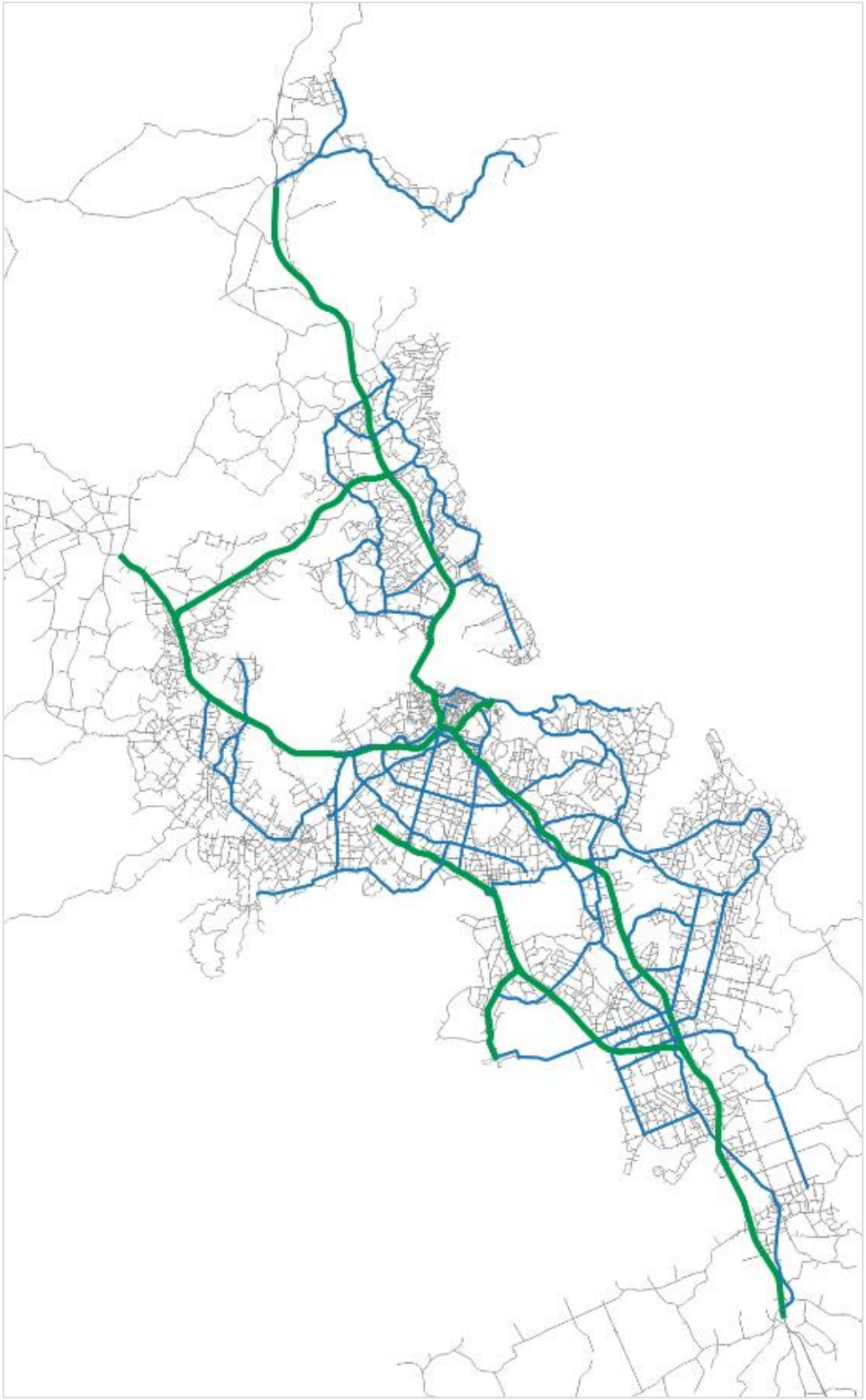
While rail services are not modelled in the ADTA, barrier arm operations at railway level crossings are represented using dummy signalised intersection coding. The underlying data including train arrival times and barrier arm operation records at each railway level crossing from March 2016 was provided by AT Strategic Rail Development.

The number of boardings at public transport (PT) stations were extracted from AT's Data Warehouse. These were used to expand the Park and Ride (PNR) survey data to estimate the total car trip generations at PNR stations, as detailed in in **Chapter 5.1.5**.

[2] Based on the following rules:

- Sample size < 6
- Peak direction median speed > posted speed limit?
- Off peak direction median speed < 10kph?
- Median and mean speed difference > 15% or 5kph
- 85th percentile speed < 5kph

Figure 5 Snitch Travel Time Routes (Motorway routes in green and arterial routes in blue)



3.2.6 Signal Control

Historical signal phasing and timing data collected by SCATS from 8 – 10 March 2016 was processed and summarised into 30-minute intervals between 6am and 7pm. This covers every signalised intersection in the region including ramp signals. This was used to derive the signal control plans coded into the model, as described in **Chapter 4.1.7**.

3.2.7 MSM Inputs

The original traffic demand matrices (in vehicles) from MSM were one of the key inputs to ADTA, providing the initial traffic demands. **Chapter 5** provides details of the transformation of the vehicle demands from MSM to ADTA.

The ADTA treats Home-Based-Work (HBW) trips differently to the other trip purposes and applies adjustment based on the observed trip origin-destination data from the Census Journey to Work (JTW) data.

The HBW Car person trips from the MSM, coupled with the JTW data, were used to calculate the JTW adjustment factors on sector-to-sector level. These were required to be in "person" trips rather than vehicle trips to be consistent with the JTW data where unit is in persons. The JTW adjustment process is discussed in **Chapter 5.1.4**.

The other input sourced from MSM was car travel time matrix skims. These were used to apply the appropriate time-varying departure time profiles in ADTA as part of the profiling process. This process is detailed in **Chapter 5.3**.

3.2.8 2013 Census and Demographic Data

Statistics New Zealand provided the key land use data including number of households, Business Demographic employee counts and school rolls (including primary, secondary and tertiary) at meshblock level. These were used to calculate the disaggregation factors to convert MSM demand matrices to ADTA zones, as detailed in **Chapter 5.1.2**. 2013 is the latest Census year with data available this was used as proxy for 2016.

Census JTW data provides information on each person's place of work and mode of travel to work. Statistics New Zealand processed this data and grouped the trips into MSM zones. This 2013 Census JTW data was used to adjust the demand distribution of the HBW trips on sector-to-sector level. The JTW adjustment process is discussed further in **Chapter 5.1.4**.

3.2.9 Park and Ride Data

In November 2015, AT conducted a survey of PT users at 17 out of 27 stations with PNR facilities across Auckland. These covered all three PT modes in Auckland, namely rail, bus and ferry, and captured information on how the PT users accessed these stations (i.e. mode of travel) and if they drove to the station whether they used the official PNR carpark or nearby on-street parking.

The survey also provided other key trip characteristics including the individuals' PT service boarding times and trip origins (i.e. home locations). Trip origins were geocoded in GIS and aggregated into the ADTA zones.

This survey provided the key data to generate car trips to and from the PNR stations in ADTA, as detailed in **Chapter 5.1.5**.

3.2.10 Vehicle Occupancy Data

AT conducts a manual vehicle occupancy survey on selected transit lane corridors each year. This survey currently provides the sole source of vehicle occupancy data for Auckland.

Analysis of the 2016 survey data showed that HOV proportions ranged between 11.4% and 27.0%, with an average of 21.8%.

To use this surveyed average to represent the regional HOV proportion in the ADTA, we identified some statistical limitations. The very low sample size aside (13 samples on seven corridors), the most obvious one was that the transit lane corridors are likely to incentivise and attract more HOV trips than the rest of the network (i.e. sampling bias).

To account for the above limitation, a reduction factor of 20% was applied, bringing down the HOV proportion to 17.5%. This figure was used to re-segment the profiled Car demands into Car – SOV and Car – HOV in **Chapter 5.4**.

4 Network Coding and Zone Structure

4.1 Network Representation

The best attempt was made to represent the model network as accurately as possible in terms of physical geometry and operational characteristics following general modelling best practice.

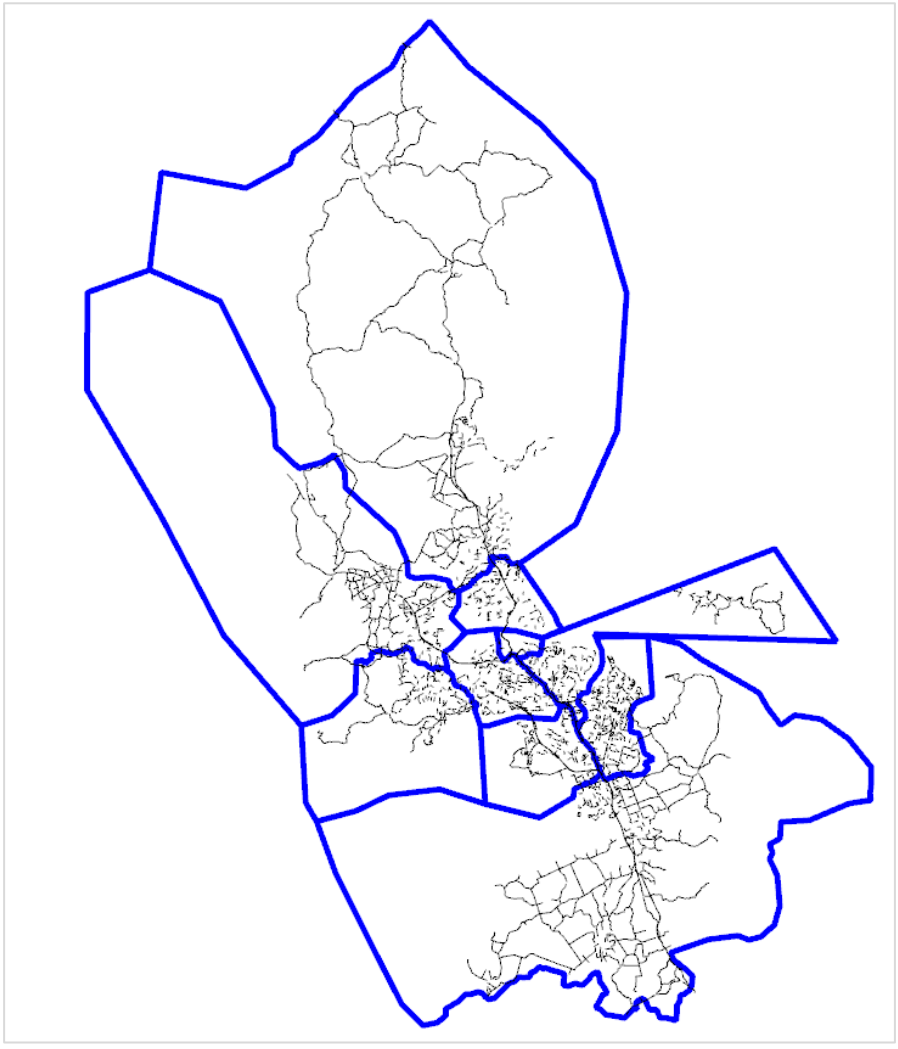
This chapter focuses on the less ordinary steps undertaken in the ADTA development, hence worth noting.

4.1.1 Subarea Network Build and Network Coding Guideline

One of the key steps of the model development was the network build in Aimsun. The starting point was an initial skeleton network from the GIS import described in **Chapter 3.2.1**and the DTA zone centroids.

For practicality and efficiency, the model extent was divided into 10 subareas and network build was completed concurrently by seven different parties comprising six consultants and AFC. **Figure 6** shows the boundaries of the 10 subareas.

Figure 6 Network Build Subareas



To facilitate this parallel network build while maintaining consistency across different subareas, a network coding guideline was developed to prescribe specifications, covering following five areas:

- **Network Refinement:** Importing georeferenced aerials, and refining the road alignment and geometry based on the aerials
- **Zone Connections:** Connecting centroids to the road network
- **Intersection Coding:** Intersection coding principles and instructions for different types of intersections
- **Other Network Details:** Additional operational details such as bus stops, reserved lanes and time-dependent operations
- **Attributes Overrides:** Use of attribute overrides for localised adjustments.

Throughout the build process, the subarea models were consolidated into the regional model network using the built-in Revision process on bi-weekly basis. Upon completion, signal control plans and bus services were added into the regional model network by AFC.

As the model development progressed, some of the original network coding approaches were revised, mainly to replace manual processes with scripting and automation. The network coding guideline has been updated and maintained as a live document to reflect these changes.

The network was coded with sufficient coverage and detail for micro-simulation, however for the assignment, less used local roads were deactivated using Geometry Configuration.

4.1.2 Road Hierarchy Parameters

Initially, the road hierarchy in ADTA was defined based on a statutory classification provided in the AT Road Hierarchy GIS.

During the initial stage of the calibration, it was found that this statutory classification did not realistically represent the real-world network operation and drivers' perception of the routes. Therefore, the modelled road hierarchy was revised to better reflect the functional operation of the roads. The final road hierarchy is presented in **Chapter 6.1**.

4.1.3 Intersection Coding

Starting from the initial skeleton model network, all intersections were refined to reflect correct physical geometry and lane allocation based on the aerial photographs and intersection layout diagrams from SCATS.

4-digit Turn EID Codes

To assist with scripting and automation, a classification system was applied to turn movements to signify different conflict situations at intersections. The external ID of each turn movement was set to a 4-digit code following the convention below:

XYZZ

where **X** = intersection type

Y = number of approaches/legs

ZZ = Movement type

X	INTERSECTION TYPE
1	Signalised
2	Roundabout
3	Priority intersection – Give-way sign at Minor Road
4	Priority intersection – Stop sign at Minor Road
5	Two-way one lane bridge
6	Zebra pedestrian crossing
Y	**NUMBER OF APPROACHES**
ZZ	**MOVEMENT TYPE**[3]
00	Unopposed Turn (e.g. Through and left turn on Major Road, as well as signalised movements)
01	Left Turn – 1-lane opposing
02	Left Turn – 2-lane or more opposing
03	Through Movement Crossing One-way Road – 2-lane one-way
04	Through Movement Crossing One-way Road – 3-lane one-way
05	Through Movement Crossing One-way Road – 4-lane one-way
06	Through Movement Crossing Two-way Road – 2-lane two-way
07	Through Movement Crossing Two-way Road – 4-lane two-way
08	Through Movement Crossing Two-way Road – 6-lane two-way
09	Right Turn from Major Road - Across 1 lane
10	Right Turn from Major Road - Across 2 lanes
11	Right Turn from Major Road - Across 3 lanes
12	Right Turn from Minor Road – One-way
13	Right Turn from Minor Road – 2-lane two-way Major Road / Across 1 lane
14	Right Turn from Minor Road – 4-lane two-way Major Road / Across 2 lanes
15	Right Turn from Minor Road – 6-lane two-way Major Road / Across 3 lanes
16	Staged Right Turn from Minor Road – Across 1 lane with flush median or merge lane in the middle
17	Staged Right Turn from Minor Road – Across 2 lanes with flush median or merge lane in the middle
18	Staged Right Turn from Minor Road – Across 3 lanes with flush median or merge lane in the middle

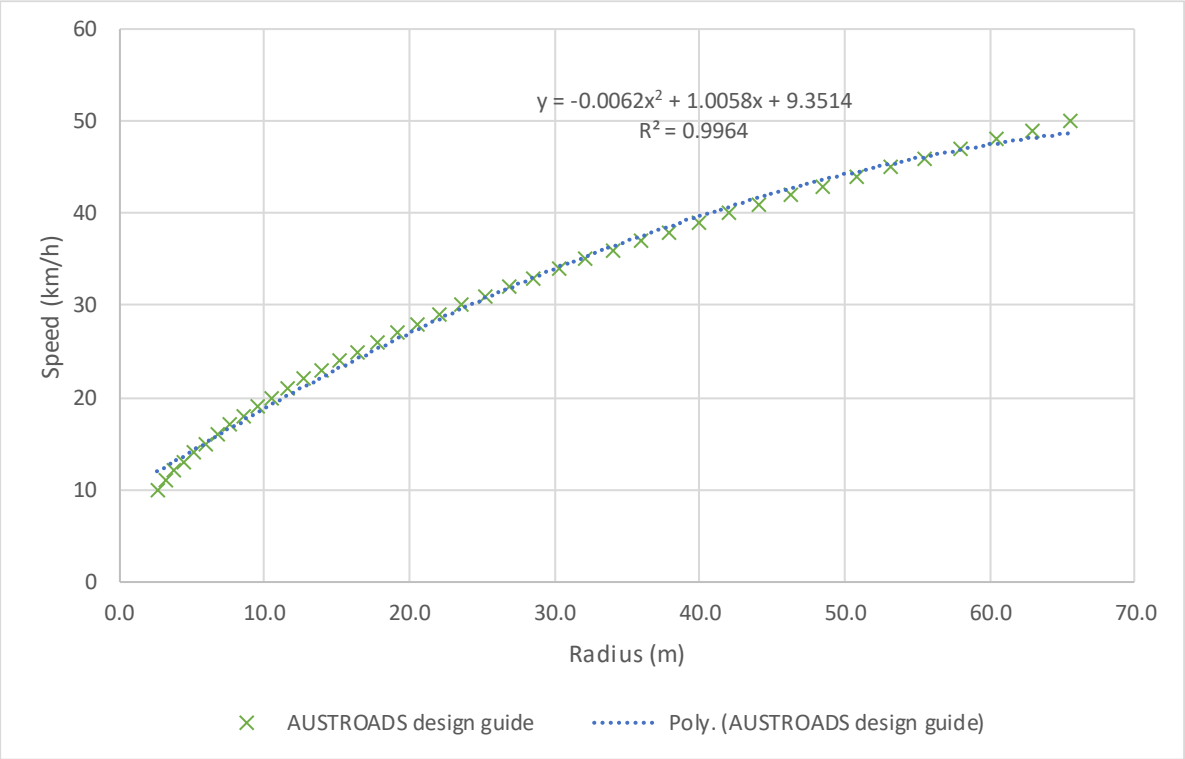
These 4-digit codes were used in multiple scripts to allocate the correct calibration parameters to each turn at the calibration stage. Examples include turn saturation flow for priority turn movements in Junction Delay Functions in **Chapter 6.1.3** and meso gap-acceptance parameters in **Chapter 0**.

[3] Based on AUSTROADS Road Design Guide Part 4A categories

Roundabout Speeds

By default, Aimsun applies the Max Speed of a Section (set by road type) to roundabout circulation lanes. In ADTA, these default Max Speeds were replaced with reduced speeds, via Attribute Overrides, based on a minimum radius formula[4] from the AUSTROADS Guide to Road Design Part 3. The green crosses in **Figure 7** below show the calculated speed for given radii, and the blue dotted line shows the equation implemented in the model using a Python script.

Figure 7 Roundabout Circulation Speeds for Given Radii



Flush Medians

Flush medians are designed for drivers to use as a refuge when turning right from the main road, and merging into traffic after turning right from a side road or driveway.

There is no designated flush median object in Aimsun. In ADTA, those right turns using a flush median were coded with short turning lanes on the mainline, coupled with a merge coding on the downstream Section to reflect the staged right turn from the side road or driveway.

[4] By rearranging the formula **Minimum radius R = Speed^2 / (127 * Side friction factor).** Assumed side friction factor of 0.3

4.1.4 Attribute Overrides

In the ADTA, any adjustments of attribute values deviating from the global settings[5] or general approaches were applied using Aimsun's Attribute Override feature as opposed to making changes directly to the objects. This is to ensure that these changes are traceable and verifiable, preventing values from being accidentally typed in. This also allows for an attribute to be set to different values between different peak periods.

These include setting Max Speeds to match posted speed limits and estimated roundabout circulation speeds, and also to reflect the reduced speed environment around town centres. A set of Attribute Overrides were also used to represent numerous construction works taking place during March 2016.

The full list of these attribute overrides and their applicability to each assignment tier can be found in **Appendix A**.

4.1.5 Traffic Management

The Traffic Management feature in Aimsun is used to code time-dependent operations such as speed reductions around schools, clearways and peak direction bus lanes.

For reduced speed limits around schools, where times of operation and reduced speeds are consistent across different locations, all affected Sections were added to a single Section Grouping and speed changes were applied collectively.

Clearways, transit lanes and bus lanes were more complicated as the times of operation and function outside peak operating condition varied widely. This was implemented in ADTA using the three-stage process, summarised below:

1. Based on the Sign layer from AT's RAMM system, create an external input file in Excel to specify all time-dependent operations using the following operation codes:

   {TM Code}_{Start Time}_{End Time}_{Lane}_{start segment}_{end segment}_{visibility distance}

   where the **TM Code** is a 2-character code representing different types of traffic management actions:

TM CODE	TRAFFIC MANAGEMENT ACTIONS
BU	Bus lane, lane reverts to parking outside signposted hours
CL	Clearway, lane reverts to parking outside signposted hours
T2	T2 lane, lane reverts to parking outside signposted hours
T3	T3 lane, lane reverts to parking outside signposted hours
G2	general T2 lane, lane reverts to all vehicle lane outside signposted hours
G3	general T3 lane, lane reverts to all vehicle lane outside signposted hours
GU	general Bus lane, lane reverts to all vehicle lane outside signposted hour
NA	not applicable (start/end codes skipped)

[5] Set by road types or vehicle types

2. Import the operation codes into an ADTA user-defined Section attribute called TrafMan via a Python script.
3. Generate the correct hierarchy of Strategy > Policy > Action objects based on the TrafMan attribute value on each Section using a second Python script.

4.1.6 Bus Services

Each bus stop was coded with the correct length and type (on-street vs layby), based on the bus stop location GIS layer and aerial photographs during the subarea network build.

GTFS and AT bus operation records define bus routes as a sequence of bus stop IDs. The latter also provides information on the bus arrival times and dwell times at each bus stop. Bus routes and their timetables were coded based on these inputs using a set of Python scripts in Aimsun:

1. Generate bus routes in Aimsun by computing the shortest paths between successive bus stops. Make manual refinements to the routes where necessary.
2. For each bus route, create a timetable based on the observed arrival times at the first stop within the model extent, as extracted from the AT bus operation records.
3. Calculate the average and the standard deviation of the dwell times for each service and each stop using the AT bus operation records and set within ADTA.

The ADTA includes all bus services in operation including school buses.

4.1.7 Signal Control

All turn movements, signal groups and SCATS detectors at signalised intersections coded during the subarea network build, along with an input table defining signal groups for each phase.

AFC developed an automated process in Excel / VBA and Python to import signal control plans into the consolidated regional network, as follows:

1. Create signal phases in Aimsun based on the signal group–phase input table.
2. Set the correct phase times based on the SCATS history data at 30-minute intervals.
3. Apply signal coordination by aligning cycle times for coordinated signals and setting signal offsets based on the SCATS controller settings data.

In DTA, a minimum green time of 5-6 seconds is required for vehicles to react to a green phase realistically. To address this, short phases were coded once every two or three cycles, so that the phase is allocated with the minimum green time of 6 seconds each time it is called.

4.2 Zone Structure

To maintain alignment with MSM, the ADTA zones are a division of the MSM zones, retaining the MSM zone boundaries without any overlaps.

Both zone systems are an aggregation of the Census 2013 meshblocks, with the following exceptions where meshblocks have been split. Most of these meshblocks are large in size and include large greenfield areas.

MESHBLOCKS	MSM ZONE	ADTA ZONE
178800	73	7301, 7302
178900	74	7403 - 7407
179000	74	7401, 7402
389300	605	30501, 30502
432400	243	24304 - 24306
711301	418	41801, 41802
711600	420	42001, 42002
712401	739	43901, 43902

Figure 8 provides an overview of the correspondence between the MSM and ADTA zones.

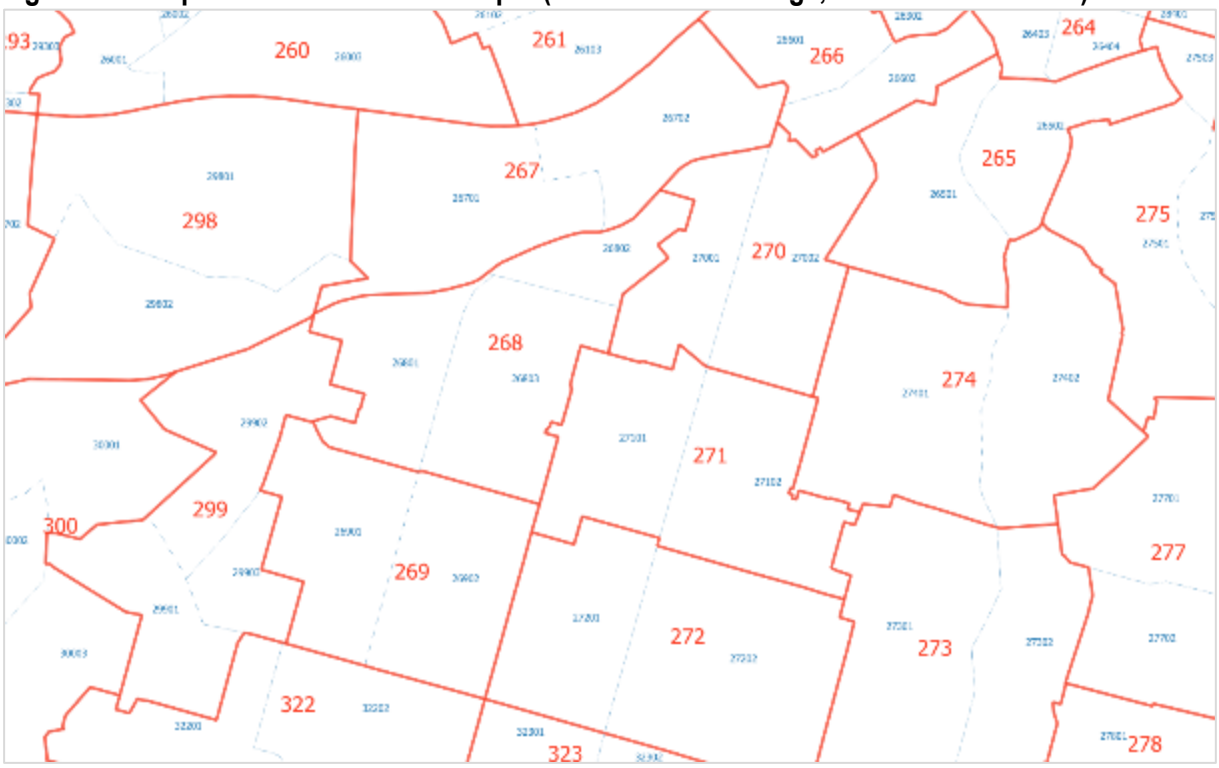
Figure 8 MSM-ADTA Zone Correspondence

	MSM	ADTA
Normal Traffic Assignment Zones	1, 2, … ,596 (596 zones)	101, 201, …. , 59601 (1207 zones) **XXXYY,** where XXX = 1 – 596, parent MSM zone YY = 01-09 identifier
External Airport Zones	597, 598 (2 zones)	**AP597, AP598** (2 zones)
External Zones	599 - 603 (5 zones)	**EX599 - EX603** (5 zones)
PNR Zones	PNR nodes (not zones in MSM) (47 nodes)	PR0351, PR0741, …, PR1341 (47 zones) **PRXXXY,** where XXX = parent MSM zone Y = identifier

4.2.1 Normal Traffic Assignment Zones

For normal traffic assignment zones, each MSM zone was split into between one and nine ADTA zones as required to reflect more detailed traffic loading and zone activities.

Figure 9 Example of MSM-ADTA Zone Split (MSM zones in orange, ADTA zones in blue)



4.2.2 External Zones

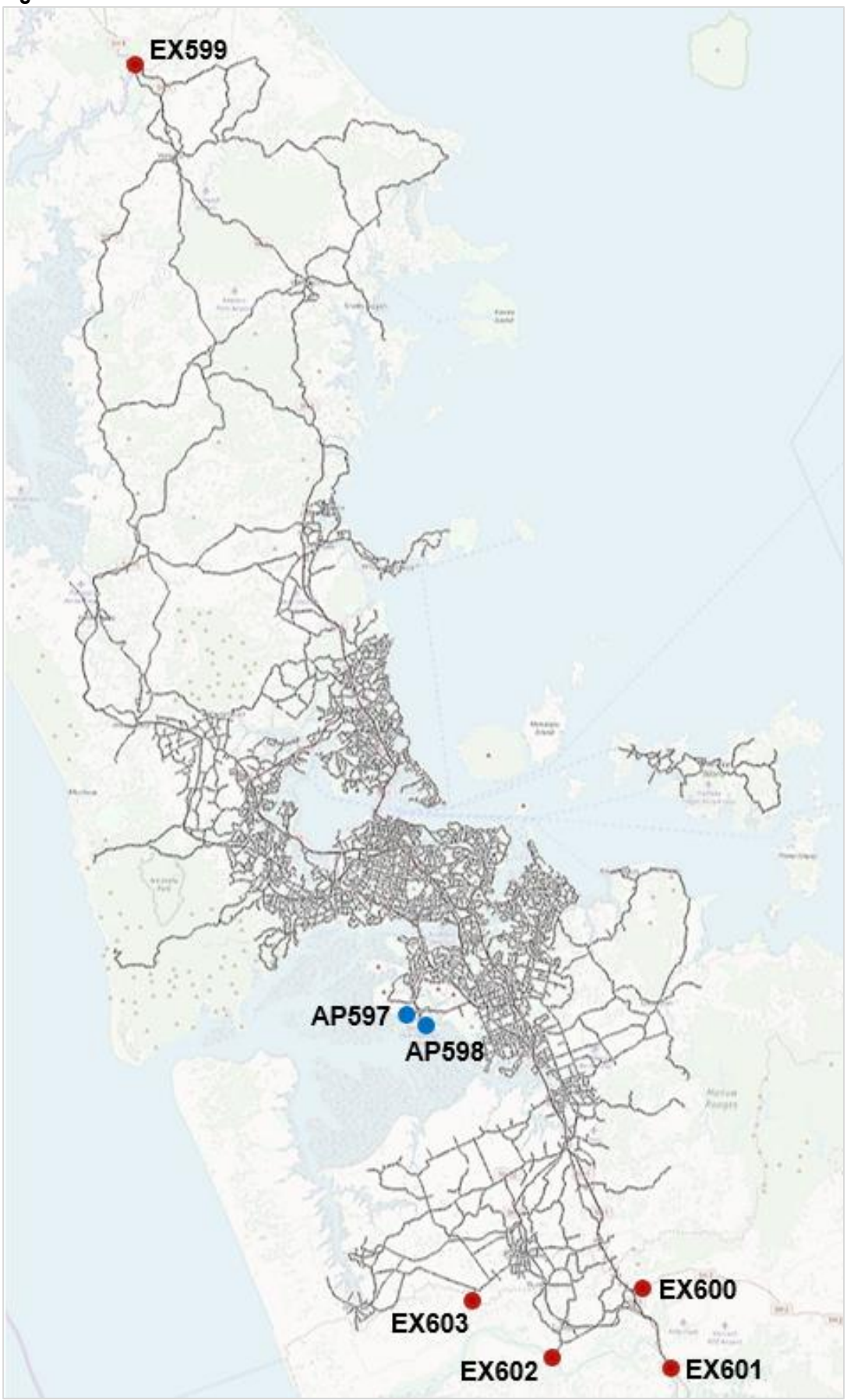
MSM has five external zones at the entry/exit points around the model boundary. These external zones were retained in ADTA as the two models have the same extent and these external points form the natural geographic boundary for the region.

EXTERNAL ZONES	DESCRIPTION
EX599	SH1 North
EX600	SH2
EX601	SH1 South
EX602	River Road
EX603	West of Tuakau

MSM has two external airport zones representing flight-related trips at the international and domestic airport terminals, and these were also retained in ADTA. These zones do not include travel associated with employment at the airport that is captured by the normal traffic assignment zones.

Figure 10 shows the external zone locations.

Figure 10 External Zones



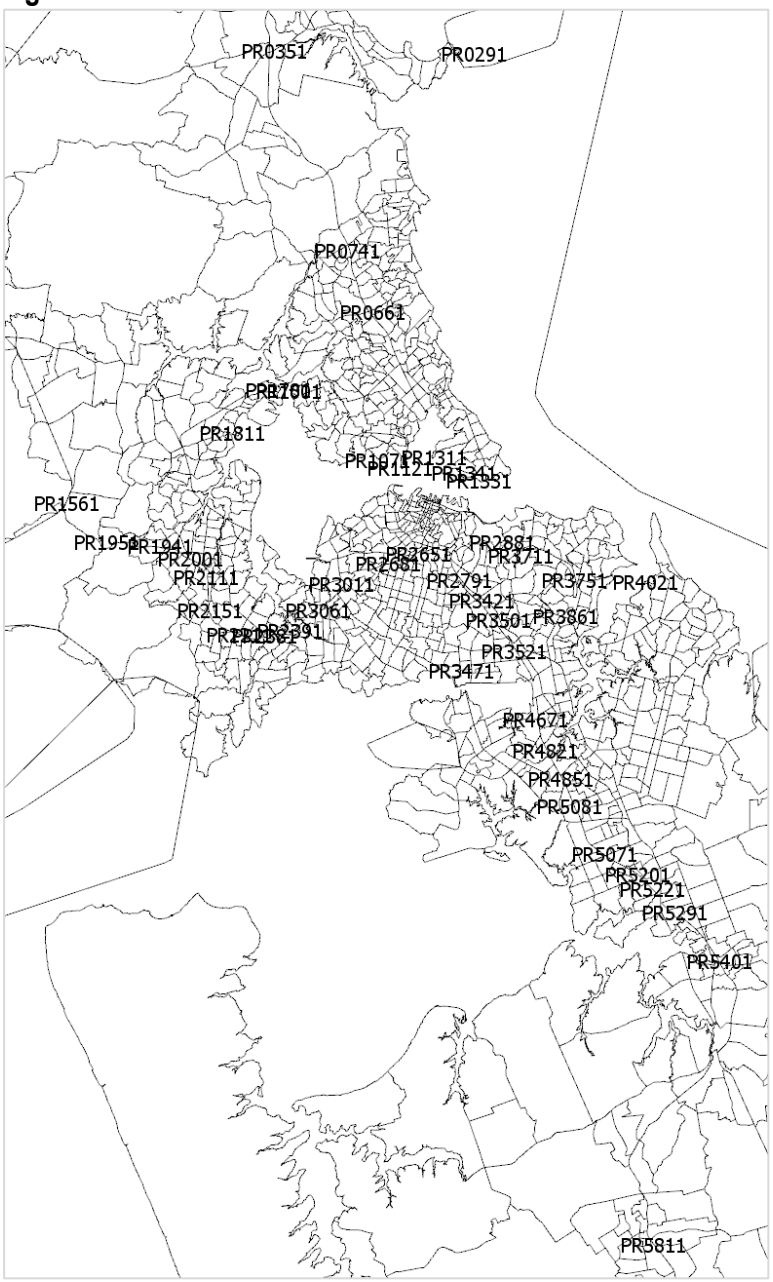
4.2.3 Park and Ride Zones

MSM does not model PNR sites as traffic assignment zones. Rather, PNR is modelled as part of the public transport assignment, with special connectors between zones and PNR sites included to represent the car component of PNRtrips.

In the ADTA, where the focus is on detailed traffic operation rather than forecasting travel demand, it was crucial to represent PNR trips on the road network. PNR sites were therefore coded as traffic assignment zones in the ADTA.

Figure 11 shows the PNR sites included in ADTA. Across the region, there are 27 official PNR sites where AT operates and maintains parking facilities. There are 20 additional locations where people drive and park at nearby free parking spaces to access PT services. These operate in the same way as the official PNR sites and both MSM and ADTA treat them as such.

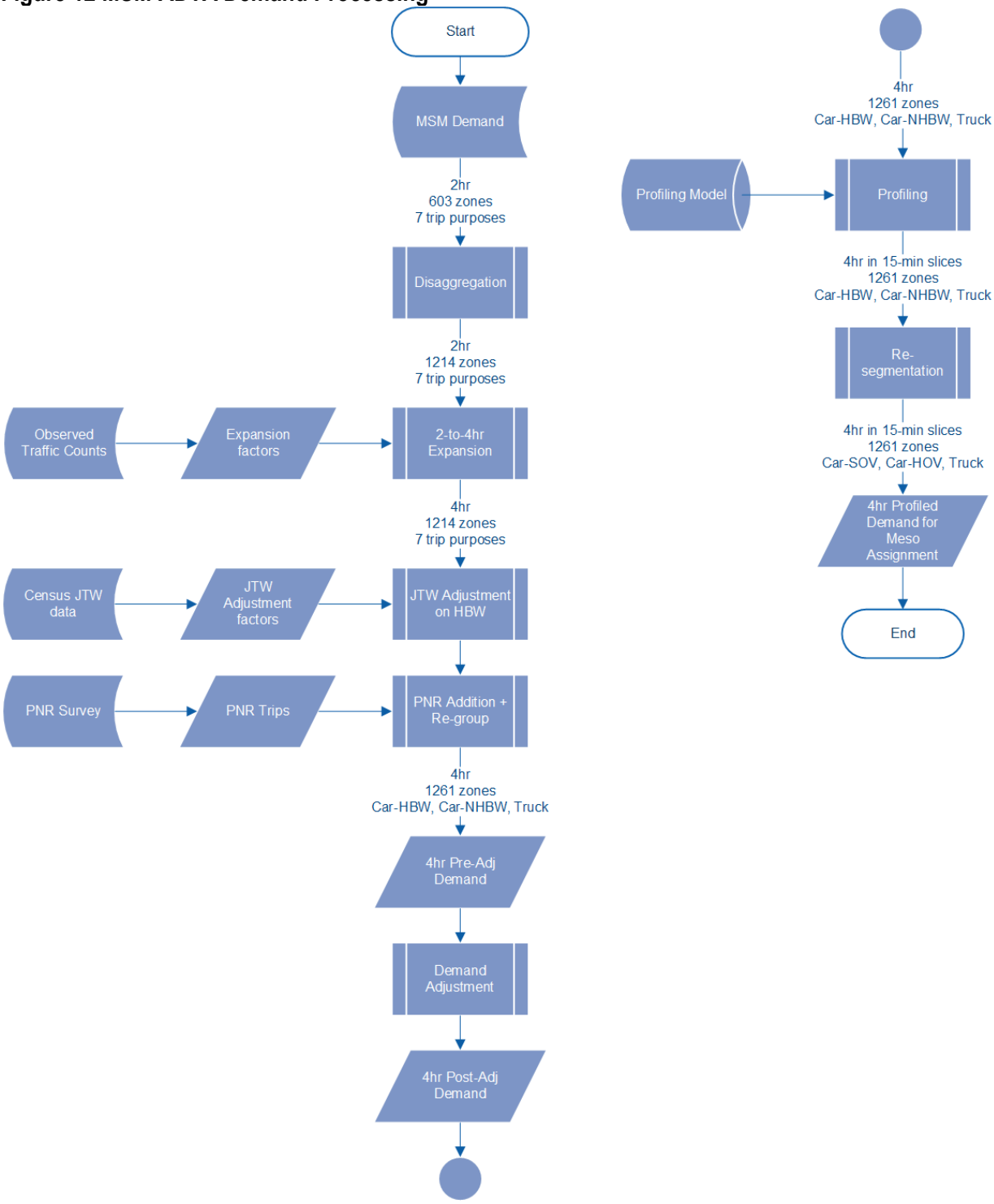
Figure 11 PNR Zones



5 Demand Processing

A series of processes were applied to the static regional demands from MSM to prepare the demands for ADTA. These included disaggregation, expansion, demand adjustment, profiling and re-segmentation, as summarised in **Figure 12**.

Figure 12 MSM-ADTA Demand Processing



5.1 MSM-DTA Conversion

5.1.1 MSM Demands

Demand matrices from MSM version 'Run72M3' (dated 19Aug2017) were used as the starting point for the ADTA demand.

MSM has the following three demand assignment periods, each with 2-hour duration.

MODEL PERIOD	DESCRIPTION
AM PEAK	Weekday 7am – 9am (2-hour)
INTER-PEAK	2-hour average of weekday 9am – 3pm (2-hour)
PM PEAK	Weekday 4pm – 6;pm (2-hour)

MSM includes seven vehicle trip purposes, comprising six trip purposes for Car and a single purpose for Truck. Demand disaggregation (discussed in **Chapter 5.1.2**) was applied for each trip purpose. This will allow for segmented willingness-to-pay responses by purpose in MSM to be passed into ADTA for future scenarios that involve road pricing.

The following table shows the original MSM traffic demand totals by trip purposes for each assignment period (2016 base year).

TRIP PURPOSE	2-HOUR TRAFFIC DEMAND TOTAL (VEHICLES)		
	AM	IP	PM
HOME-BASED-WORK	197115	44976	183978
HOME-BASED-EDUCATION	39067	15633	14192
HOME-BASED-SHOPPING	21244	71738	48399
HOME-BASED-OTHER	134998	157200	173970
EMPLOYERS BUSINESS	64396	44599	68616
NON-HOME-BASED-OTHER	60278	134393	82301
TRUCK	28514	29128	22606
TOTAL	**545611**	**497667**	**594063**

5.1.2 Demand Disaggregation

A disaggregation process was set up in Excel / VBA to convert the MSM demand matrices to the ADTA zone structure. It took following steps:

1. Collate the number of households, employees and students for each meshblock from the 2013 Census and demographics data.
2. Apply the disaggregation equations[6] from MSM to estimate trips ends for each meshblock, by time period, direction (i.e. inbound vs outbound) and trip purpose.

[6] From **Auckland Transport Models Project ART3 Sundries Report (SKM, August 2008)**. Linear regression models developed specifically for disaggregation processes and do not represent actual trip ends.

3. Sum trip ends over MSM zones and ADTA zones.
4. Compute disaggregation factors as the contribution of each ADTA zone to the total trip ends of the corresponding MSM zone (i.e. trip ends ratio of ADTA zones to MSM zones).
5. Assume an equal split for any ADTA zones that are smaller than meshblocks.

The MSM disaggregation equations are linear regression models that take the following form:

Trip Ends = a x HH + b x Emp + c x Rolls

where **HH** = Total number of households

Emp = Total number of employees

Rolls = Total number of students

a, b, c = Model parameters, defined below:

TRIP PURPOSE - DIRECTION	AM			IP			PM		
	a	b	c	a	b	c	a	b	c
ALL O	0.834	0.231	0.021	1.572	1.075	0.192	0.364	0.674	0.054
ALL D	0.272	0.674	0.131	1.454	1.162	0.261	0.820	0.260	0.046
HBW O	0.404	0.000	0.000	0.179	0.098	0.000	0.000	0.330	0.000
HBW D	0.000	0.366	0.000	0.105	0.167	0.000	0.367	0.000	0.000
HBE O	0.078	0.000	0.000	0.064	0.000	0.038	0.000	0.000	0.031
HBE D	0.000	0.000	0.113	0.000	0.000	0.109	0.018	0.000	0.011
HBSH+HBO O	0.275	0.000	0.000	1.002	0.307	0.000	0.264	0.127	0.000
HBSH+HBO D	0.192	0.092	0.000	0.999	0.321	0.000	0.351	0.043	0.000
HCV=EB	0.102	0.301	0.000	0.176	0.454	0.000	0.085	0.265	0.000
NHBO	0.083	0.120	0.030	0.500	0.899	0.275	0.095	0.168	0.052

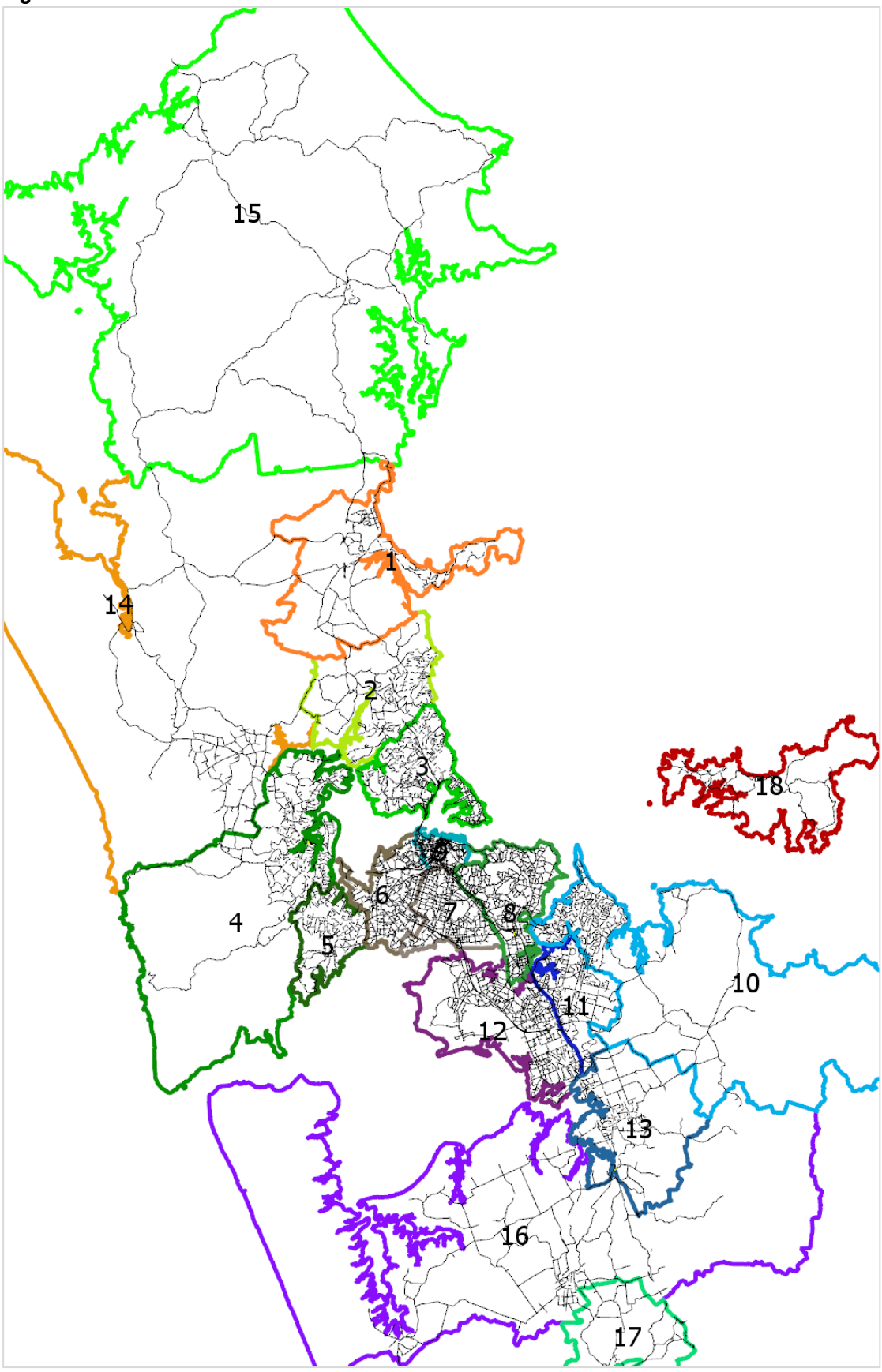
5.1.3 Time Periods Demand Expansion

For the AM and PM model periods, the 2-hour demand matrices from MSM had to be expanded to the 4-hour model periods in ADTA.

Analysis of observed traffic count profiles showed considerable variation across the region, indicating that a global expansion factor for each peak period was not appropriate.

An existing geographic grouping of zones into 18 sectors is defined within MSM as shown in **Figure 13**. These sectors were used to apply expansion factors in ADTA shows its definition.

Figure 13 MSM 18-Sectors



Three expansion factors were calculated for each 'origin sector' – 'destination sector' pair, based on the following:

- Traffic count profile at the largest on-ramp serving the origin sector
- Traffic count profile at the largest off-ramp serving the destination sector
- Traffic count profile at a key en-route location (e.g. Harbour Bridge, major arterial connecting the two sectors)

An expansion factor for each 'origin sector' – 'destination sector' pair was then estimated based on the calculated expansion factors by considering the amount of travel expected to occur outside of the peak two hours given typical trip lengths.

For example, trips from Silverdale/Whangaparaoa (1) to the CBD (9) are in excess of 35km and many of these trips are known to depart early in the morning before 7am (i.e. outside the 2-hour MSM model period). The three expansion factors calculated from the traffic count profiles for this pair ranged from 1.82 to 1.98, and therefore based on our understanding of the trip characteristics, the higher factor of 1.98 was chosen as the expansion factor.

The resulting expansion factors for each peak period are provided in **Appendix B**.

5.1.4 Journey-to-Work Adjustment

For HBW trips, an adjustment was made to the initial MSM demands to reflect the known trip distribution from the Census JTW data. This was applied at a sector-to-sector level, similar to the expansion factors.

The adjustment is outlined below:

1. Estimate the 2-hour peak period car trips from the daily JTW data using the HBW Car time period factors[7] from MSM.
2. Group the estimated peak period JTW trips into 'sector origin' – 'sector destination' pairs using the 18-sector system.
3. Similarly, group the initial HBW Car person trips from MSM into 'sector origin' – 'sector destination' pairs for each peak period.
4. For each 'sector origin' – 'sector destination' pair, calculate the JTW adjustment factor as the ratio of the JTW trip total to the MSM HBW Car person trip total (note both units are in persons). Cap the adjustment factors at 6 to avoid over-fixing.

The resulting JTW adjustment factors for each peak period are provided in **Appendix C**. These factors were applied to the HBW vehicle matrices.

5.1.5 Park and Ride Trips

PNR trips were estimated using data from the November 2015 PNR survey, observed PT boardings from AT's Data Warehouse and the synthetic PNR trip distribution from MSM.

The PNR survey captured the arrivals at the PNR sites, between 6:30am and 9:30am and 10:30am and 1:30pm. Based on the nature of PNR trips, where all arrivals must have a corresponding departure and there is no overnight parking, the following assumptions have been made:

[7] From **Auckland Transport Models Project Time of Day and Vehicle Drive Factors (SKM, January 2007)**; provides ratios between time period trips to 24-hr trips for each trip purpose.

- During the AM peak, all PNR trips are arrivals.
- During the inter-peak, a proportion of the AM arrivals will depart. There will be new arrivals subject to availability of parking spaces.
- During PM peak, all PNR trips are departures. These are comprised of the remaining AM arrivals plus all inter-peak arrivals.
- People fill up the official PNR carpark first because it has more direct access to the PT station, and then use the on-street parking.

Based on these assumptions, the following steps were taken to estimate PNR trips:

AM peak and inter-peak arrivals

1. For each PT station surveyed, calculate the car driver mode share. Split this into official PNR parking and nearby free on-street parking based on the number of parking spaces.
2. For PT stations not surveyed, apply the car driver mode share by parking location from a surveyed station with similar characteristics.
3. Determine parking capacities for the official PNR carpark and on-street parking using published information and aerial photographs.
4. Estimate the number of car arrivals for each parking location by applying the car driver mode share to the number of PT boardings from AT's Data Warehouse.

   For AM peak: Cap car arrivals at capacity for each parking location. If the estimated car arrivals at the official PNR carpark is lower than its capacity and the survey indicated overflow into on-street parking, set the arrivals to capacity (i.e. assume the official PNR carpark is full)..
5. Distribute the car arrivals using the geocoded trip origin data from the PNR survey. For PT stations not surveyed, apply the PNR trip distribution from MSM (disaggregated into ADTA zones using the HBW origin disaggregation factors).

Inter-peak departures

6. Estimate the inter-peak departures as the difference between the total number of arrivals during the inter-peak periods, and the number of parking spaces available after the AM peak.
7. Distribute the inter-peak departures by reversing the direction of the corresponding AM peak arrivals (i.e. origins become destinations).

PM peak departures

8. Estimate the PM peak departures as the sum of the remaining AM peak arrivals and the inter-peak arrivals.
9. Distribute the PM peak departures by reversing the trip distribution of the corresponding AM peak and inter-peak arrivals.

PNR trips were added to the HBW Car trip demands.t

Note that the car passenger mode was included in the PNR survey but was not split into those who were dropped off and those who parked with a car driver. Therefore car passengers have not been included in the PNR trip generation to avoid double-counting of vehicles where both the driver and passenger used the PT station. This, however, means that the car trip associated with passengers being dropped off at the PT station ("kiss-and-ride" trips) are not captured in this trip generation.

5.2 OD Demand Adjustment

The adjustments to the 2-hour MSM demands,detailed in the previous chapters, provided initial demand matrices for ADTA. These were adjusted further using the Aimsun origin-destination (OD) demand adjustment, more commonly known as matrix estimation (ME).

This chapter provides details on the demand adjustment process and the resulting changes to the initial demand matrices.

5.2.1 Methodology

The OD demand adjustment was undertaken using the ADTA static assignment.

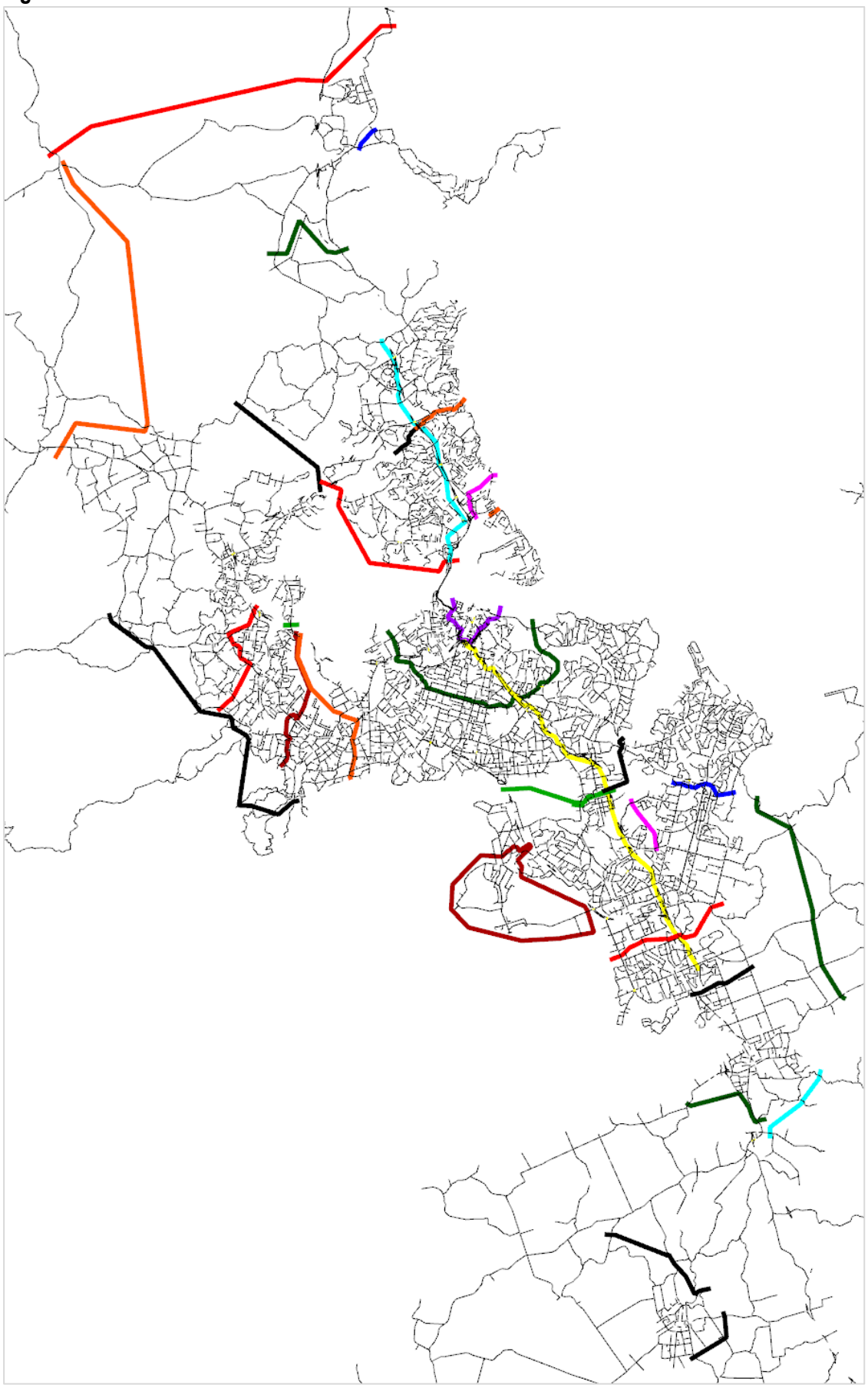
The following methods were used to increase model integrity and accuracy:

- Observed traffic counts were grouped into screenlines and adjustments were made based on the screenline totals and not the individual Section counts. This ensures we are adjusting the demand across a screenline and prevents overfitting of the OD demand to a specific path assignment (route choice). Care was taken ensuring each screenline covered all major alternative route choices.

  Figure 14 shows the screenlines used for the OD adjustment.

- Only observed traffic counts that were considered reliable were input to the OD adjustment process. This was achieved by using observed count records with the highest reliability rating available at each location (set during the traffic count verification described in Chapter **3.2.2**).

Figure 14 Screenline Locations



Below are the settings used for the Aimsun OD demand adjustment.

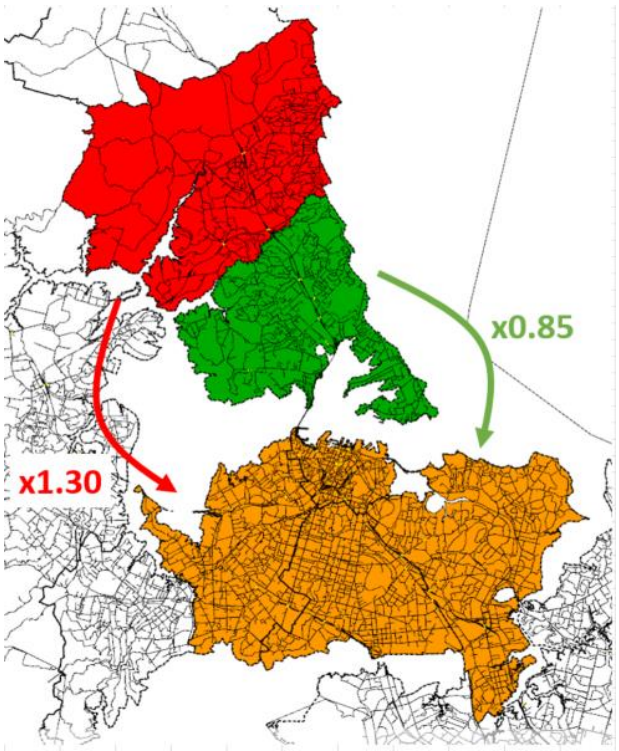
OD DEMAND ADJUSTMENT PARAMETER	VALUE
ADJUSTMENT ITERATIONS	40
MAXIMUM DEVIATION	50% for Car 0% for Truck
MATRIX ELASTICITY	1.0 for Car 0.01 for Truck
TRIP LENGTH DITRIBUTION ELASTICITY	0.5 for Car 0.01 for Truck

No deviation was allowed to the initial truck demand matrices. These were developed for MSM from observed OD sample data from NZTA's eRUC system (Electronic Road User Charge Management System) and underwent a separate refinement process.

Ideally, the OD demand adjustment would be applied separately to each of the three vehicle classes used in the meso dynamic traffic assignment using traffic counts classified into Car – SOV, Car – HOV and Truck. However, most of the observed counts were unclassified and therefore the OD demand adjustment was applied to 'All Vehicles' using the total traffic counts.

Following the automated OD demand adjustment in Aimsun, localised manual adjustments were also made to the AM peak demands to better reflect trip patterns that were not well represented in the initial demands. The affected zones and adjustment multipliers are summarised in **Figure 15** below.

Figure 15 Manual Demand Adjustments (AM Peak only)



5.2.2 Impact of OD Demand Adjustment

The following tables and figures present the changes in demands and impact on trip length distribution resulting from the OD demand adjustment (including the manual adjustments).

Coupled with the screenline total calibration results presented in Chapter 0, these indicate that the total demands were calibrated appropriately for each peak period without unreasonably skewing the original trip-length distribution.

5.2.2.1 Demand Changes

The change in the total trip matrix for each peak period is summarised below.

Summary of Total Demand Changes

TOTAL DEMAND	AM (4HR)	IP (2HR)	PM (4HR)
PRE-ADJUSTMENT (VEH)	924,531	498,724	1,136,067
POST-ADJUSTMENT (VEH)	918,716	487,579	1,084,386
CHANGE (VEH)	**-5,815**	**-11,144**	**-51,682**
CHANGE (%)	**-0.6%**	**-2.2%**	**-4.6%**

The following figures show the distribution of the absolute changes in OD cell demands for each peak period. In each case, nearly all (>98%) OD cells changed by 1 trip or less.

Figure 16 AM Peak OD Change Distribution

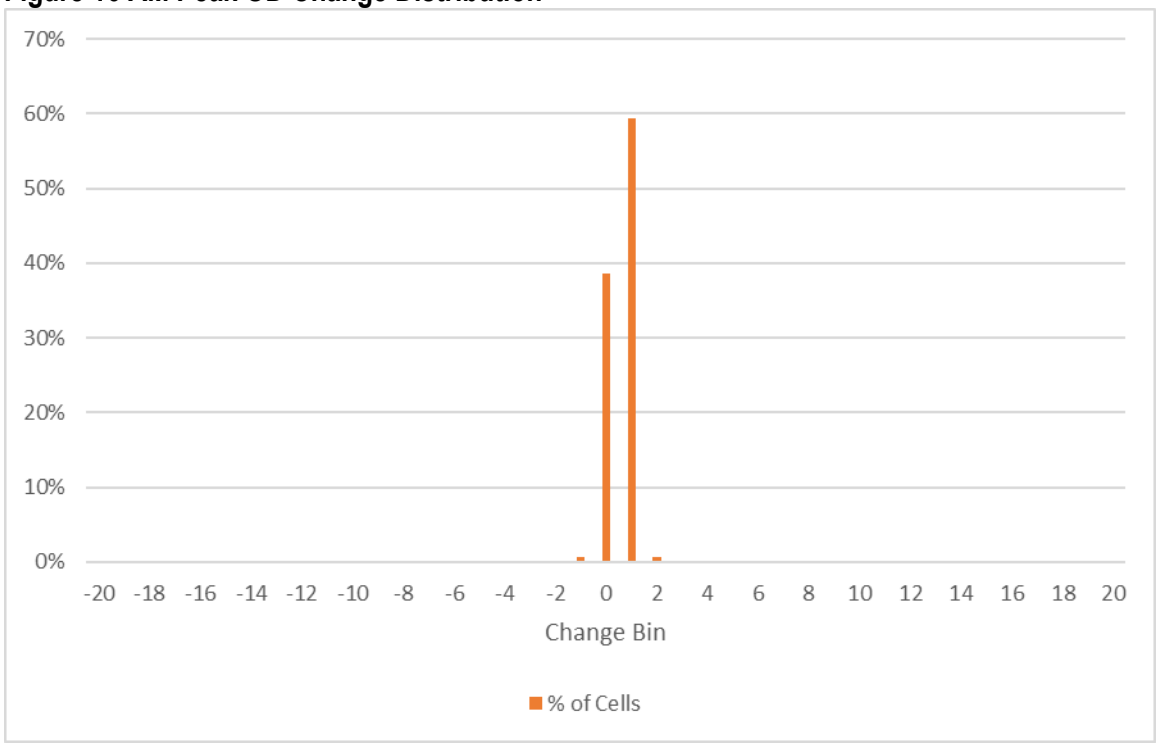


Figure 17 Inter-peak OD Change Distribution

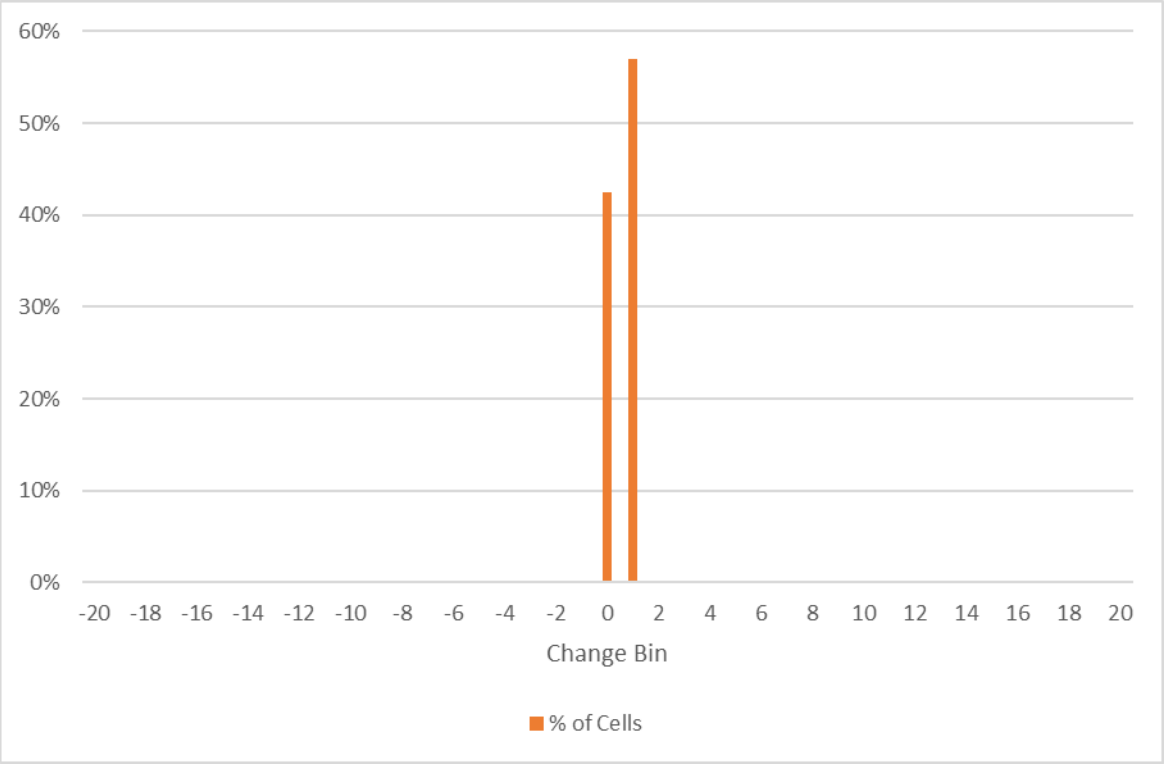
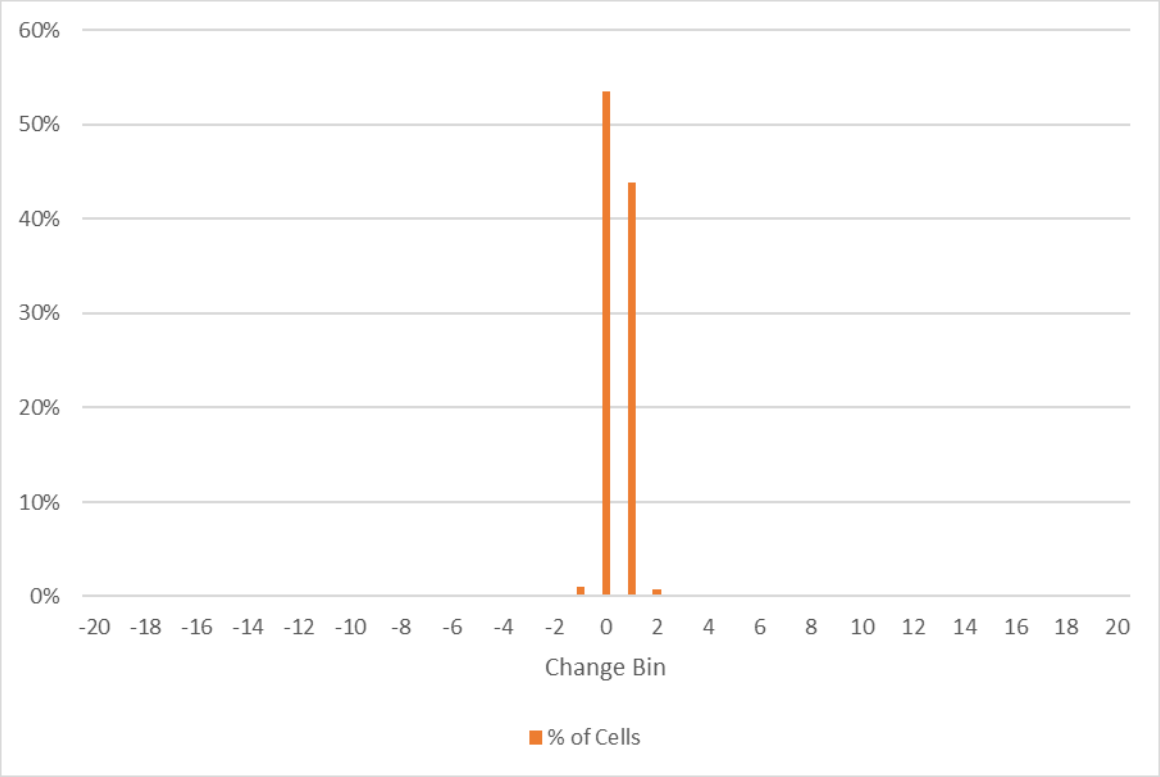


Figure 18 PM Peak OD Change Distribution



Appendix D provides the aggregated changes in sector-to-sector demands.

5.2.2.2 Trip Length Changes

The change in the average trip length within the model for each peak period is summarised in the table below and the distribution of trip lengths is provided in Figures 19-21.

Summary of Trip Length Distribution Changes

AVERAGE TRIP LENGTH	AM	IP	PM
PRE-ADJUSTMENT (KM)	10.2	9.0	10.4
POST-ADJUSTMENT (KM)	9.7	8.3	9.3
CHANGE (KM)	**-0.5**	**-0.7**	**-1.1**
CHANGE (%)	**-4.9%**	**-8.1%**	**-10.7%**

Figure 19 AM Trip Length Distribution

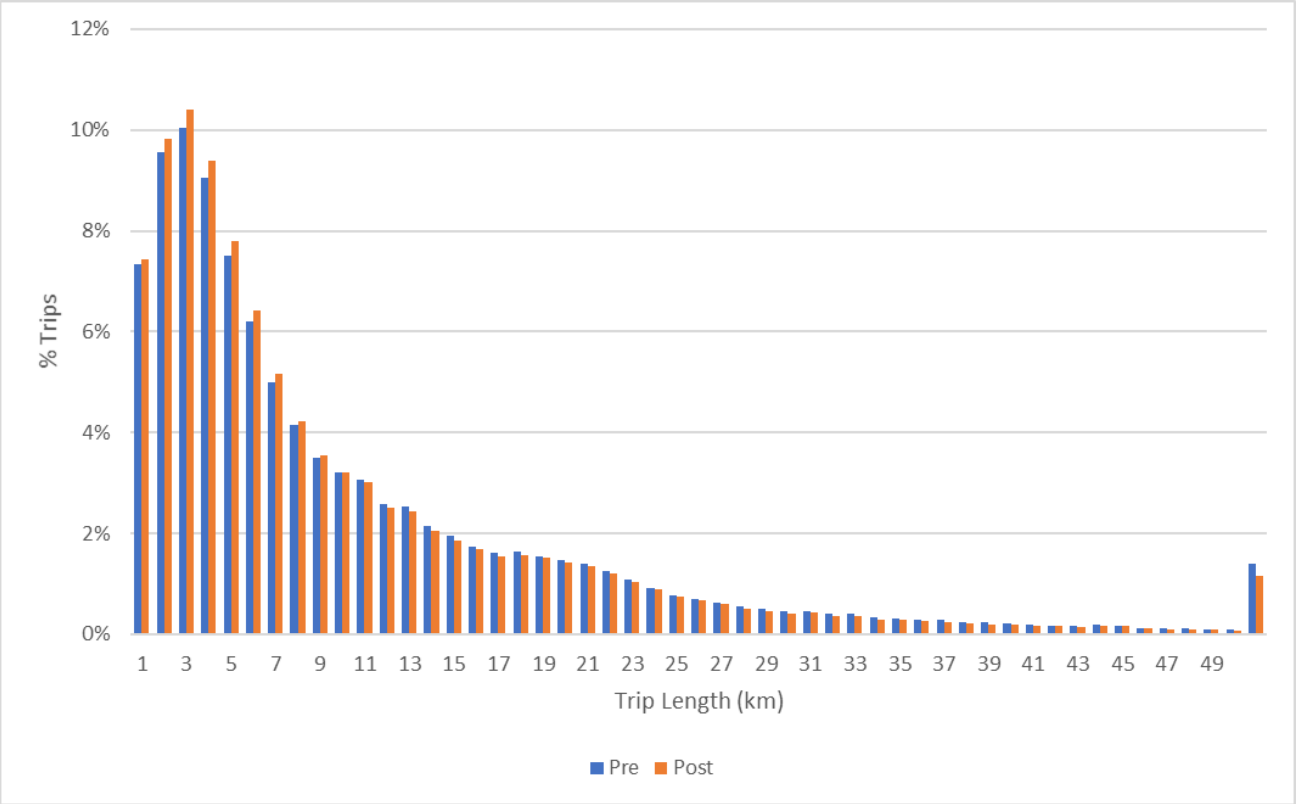


Figure 20 Inter-peak Trip Length Distribution

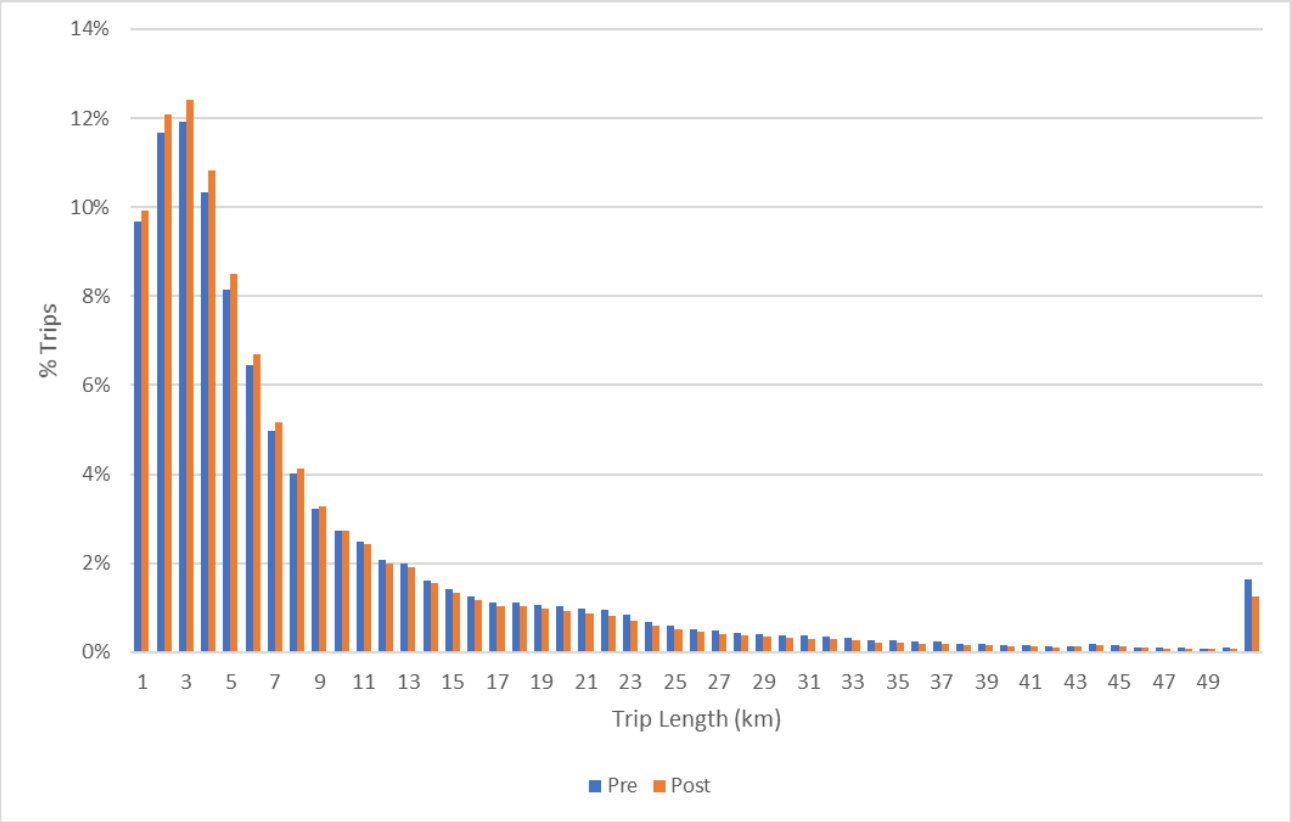
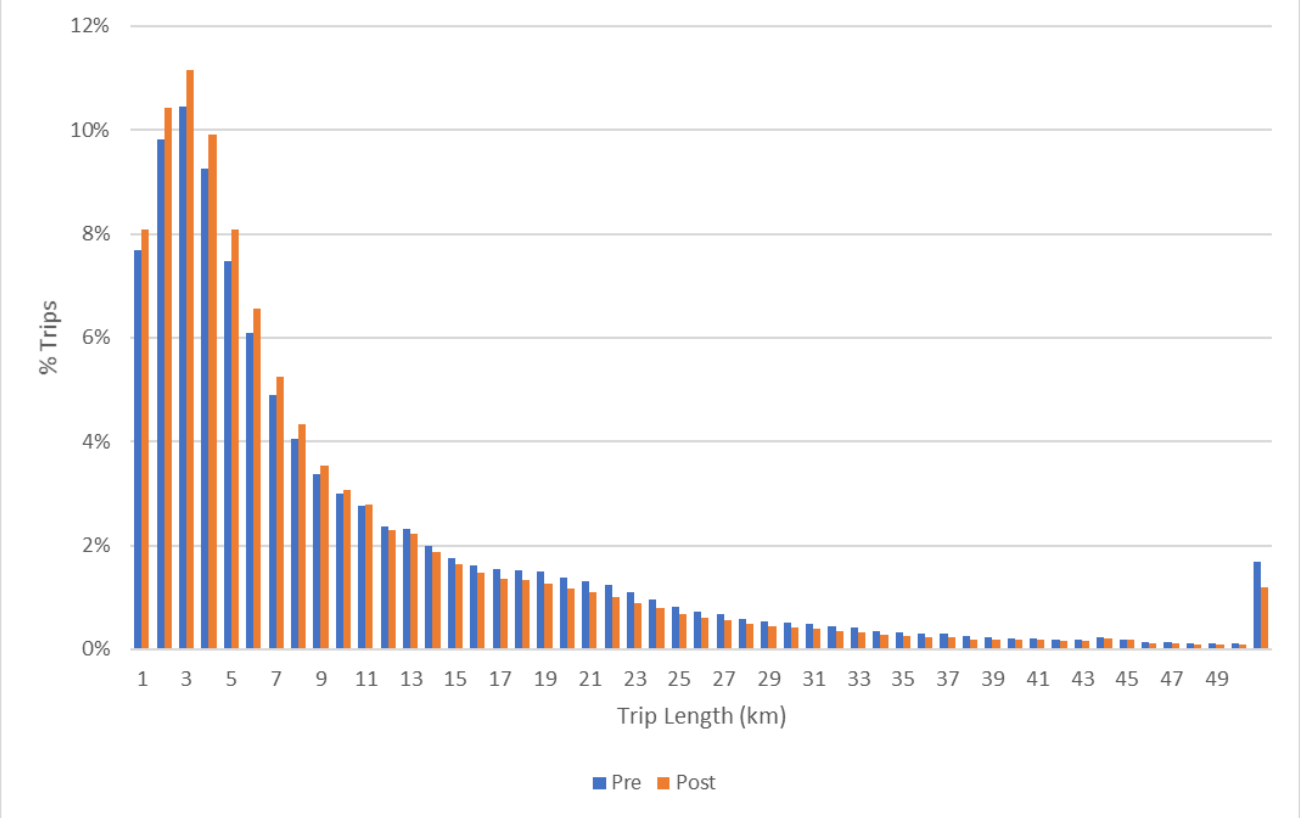


Figure 21 PM Trip Length Distribution



5.3 Profiling

For large scale DTA models developed in Aimsun, it is a common practice to use the departure time adjustment tool to slice the total demands into individual time intervals (15-minute intervals in the case of the ADTA) based on observed traffic count profiles.

This tool was trialled for ADTA, but was found to be inappropriate. Auckland has a congested road network and actual demand profiles are typically very different to throughput profiles observed in traffic counts. Consequently, fitting the demand profiles to observed traffic count profiles did not reproduce the queue build up and associated delays during peak periods.

As such, a bespoke profiling model was developed using Excel / VBA, adopting a simplified form of an integrated departure time choice and trip distribution model[8] that is based on the well-known Vickrey's model. The process can be summarised as follows:

1. Estimate the desired arrival profile based on observed count profiles at major attractions, (normalised to sum to 100%) Desired arrival profiles have been estimated by trip purpose. The underlying principle of the profiling model is that people will select their departure times to satisfy these desired arrival profiles.
2. For each origin **O** to destination **D**, calculate generalised costs c_{ODt} for a range of departure times **t** over a range of desired arrival times t^{pref}_{OD}. Generalised cost has been defined as the sum of the costs of travel time τ_{ODt}, early arrival time and late arrival time, as follows, where these times are weighted by **α**, **β** and **γ** respectively.

   $$c_{ODt} = \alpha [\tau_{ODt}] + \beta[\max(0, t^{pref}_{OD} - (\tau_{ODt} + t))] + \gamma[\max(0, (\tau_{ODt} + t) - t^{pref}_{OD})]$$

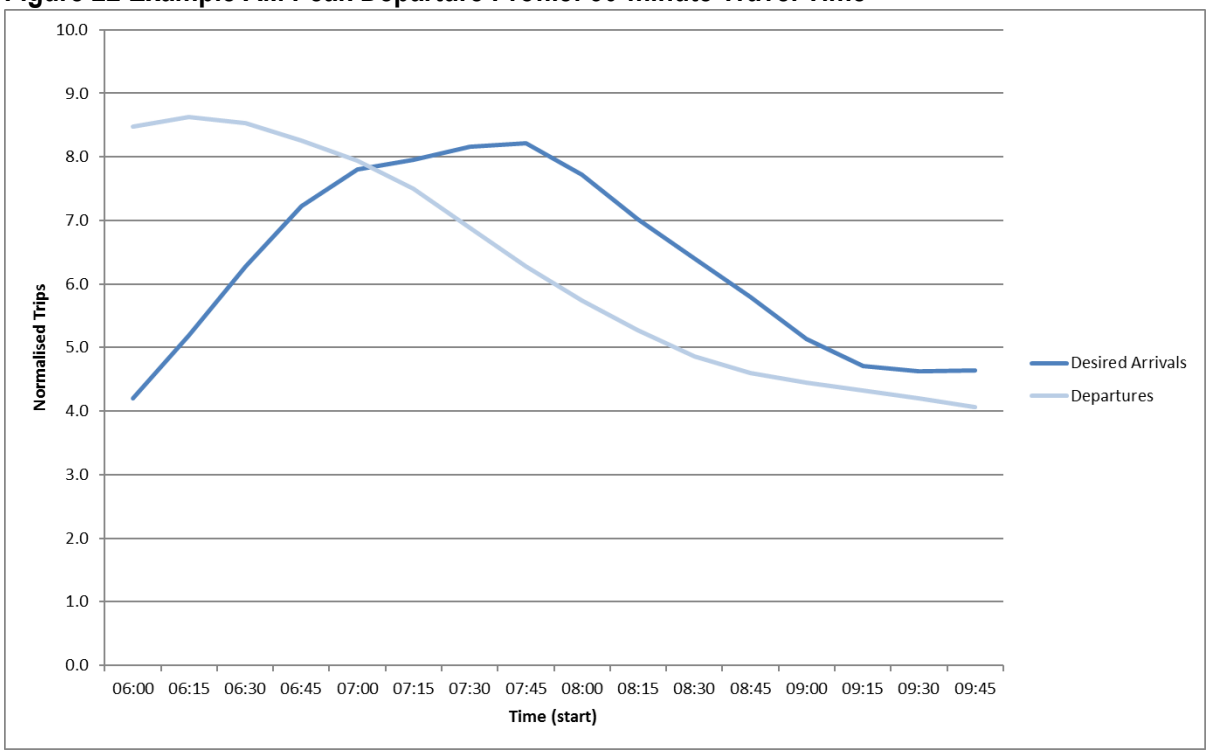
3. For each desired arrival time, distribute the proportion of arrivals (from step 1) across the departure times using friction factors of $1/ c_{ODt}$.
4. Sum the proportions allocated to each departure time and normalise to sum to 100% across all departure times. This is the departure time profile for a given origin to a given destination.
5. To simplify the process, a constant travel time was assumed for all departure times, and a series of generic departure profiles was then calculated for discrete travel times in 15 minute intervals.
6. Car travel skims from MSM were then used to select the closest generic departure profile for each OD pair in ADTA. This profile was applied to the 4-hour demand to generate profiled demand matrices.

Currently in the base model, profiling is applied separately for Car HBW, Car Non-HBW and Truck. However, the process, is set up to handle any combinations of vehicle classes used in MSM if a clearer distinction can be made between individual trip purposes from the observed traffic count profiles.

For AM peak HBW trips the desired arrival profile was estimated using trip attractions at carparks near key employment areas in the CBD, town centres and at the airport. **Figure 22** presents the departure time profile for OD pairs with a 30-minute travel time in the AM peak for HBW trips.

[8] Based on **Demand Profiling for Dynamic Traffic Assignment by Integrating Departure Time Choice and Trip Distribution (Levin, M W et al, 2016), Computer-Aided Civil and Infrastructure Engineering 31 (2016) p86-99**

Figure 22 Example AM Peak Departure Profile: 30-minute Travel Time



Typically, the departure profiles from a base model are retained for future scenarios, assuming people will continue to depart at the same time in the future regardless of travel conditions. This is a significant limitation for forecasting.

Developing a process whereby departure profiles respond to the desired arrival time profile and travel costs provides a flexible and robust approach for forecasting, where the impact of changes in travel times and other travel costs on departure time selection can be represented. Note that other travel costs such as road pricing could be incorporated into the generalised costs c_{ODt} used in this process.

5.4 Re-Segmentation

The final step in the demand adjustment was to re-segment the profiled Car demands by trip purpose into the two occupancy-based vehicle classes used in the meso dynamic traffic assignment of ADTA, namely Car – SOV and Car – HOV.(detailed previously in **Chapter 0**).

The Car – HBW and Car Non-HBW profiled matrices were combined and then split into Car – SOV and Car - HOV using the global HOV proportion of 17.5%, as detailed previously in **Chapter 3.2.10**. Varying the proportion of each occupancy class by trip purpose and time interval was considered, however there was no data to support this.

6 Static Assignment Calibration

The first tier of ADTA is the macro tier or static assignment. The main purpose of this tier is:

- To calibrate the 4-hour period demand using OD demand adjustments
- To generate an initial set of assignment paths for the subsequent dynamic assignments in the meso tier.

The macro tier is considered a support tool for the meso tier, and is not expected to produce direct model outputs for analysis. However, to ensure consistency between the two tiers, the static model was calibrated to align with the calibrated meso model as closely as possible.

This chapter provides details of the generalised cost calculation and static assignment parameters in ADTA.

6.1 Generalised Cost Calculation

Generalised cost in ADTA consists of costs of travel time and travel distance.

The travel time component consists of link travel times, represented by a Volume Delay Function (VDF) on Sections, and delays associated with making a turn at an intersection, represented by a Turn Penalty Function (TPF) and Junction Delay Function (JDF).

The travel distance component reflects perceived vehicle operating costs and helps stabilise the traffic assignment.

The form of these functions are outlined in the following subsections.

6.1.1 Volume Delay Function

The VDF in ADTA is based on the Akçelik VDF, which is widely adopted by strategic models in New Zealand, including MSM. Its formulation is as follows:

$$t = t_0 \{1 + 0.25 r_f [z + (z^2 + 8 J_A x / (Q t_0 r_f))^{0.5}]\}$$

where:

- t = average travel time per unit distance (seconds per km)
- t_0 = free flow travel time per unit distance (seconds per km)
- J_A = Akçelik friction parameter
- z = x – 1
- x = q / Q = degree of saturation
- q = demand flow rate (pcu/hr)
- Q = capacity (pcu/hr)
- r_f = the ratio of flow period to minimum travel time

Because Aimsun requires the generalised cost to be in minutes, the travel time on each Section was calculated by multiplying the resulting **t** by the Section length and dividing by 60. This function was applied to every Section in the ADTA, including centroid connectors.

Different values of free flow speed, link capacity and Akçelik friction factors were defined by road type using Section attributes. The table below provides a summary of these parameters for the final road hierarchy. All vehicle types used the same VDF in the static assignment.

NAME	MAX SPEED	LANE CAPACITY	J_A	DISTANCE FACTOR D_R[9]
MOTORWAY 100KMH 0.8XDIST	100	2,100	0.4	0.8
NORTHERN GATEWAY TOLL ROAD 100KMH 2.5XDIST	100	2,100	0.4	2.5
MOTORWAY RAMP 70KMH 0.8XDIST	70	1,800	0.4	0.8
URBAN 50KMH 1XDIST	50	1,800	0.3	1.0
URBAN 50KMH 2XDIST	50	1,450	0.8	2.0
URBAN 50KMH 3XDIST	50	1,450	0.8	3.0
URBAN 50KMH 4XDIST	50	1,350	0.9	4.0
URBAN 50KMH 5XDIST	50	1,300	0.9	5.0
URBAN 50KMH 6XDIST	50	1,250	1.0	6.0
URBAN 50KMH 8XDIST	50	1,100	1.1	8.0
URBAN 40KMH 10XDIST	40	1,000	1.2	10.0
URBAN 30KMH 10XDIST	30	500	2.0	10.0
URBAN 10KMH 10XDIST	10	500	2.0	10.0
RURAL 100KMH 1XDIST	100	1,800	0.4	1.0
RURAL 75KMH 6XDIST	75	1,400	1.2	6.0
RURAL 50KMH 10XDIST	50	1,000	2.0	10.0
CONNECTORS	30	200	10	1.0

6.1.2 Intersection Delays – Signalised Movements

In Aimsun, a turning movement can be assigned a JDF, a TPF, or both.

Aimsun 8.2 provides default TPFs for signalised turning movements based on their respective green time split, adopting the procedures from Chapter 18 of the Highway Capacity Manual (HCM) 2010.

This procedure requires a movement capacity as an input and in the ADTA this was estimated based on the following formula:

$$Q = Q_s \times I \times g / C$$

where:

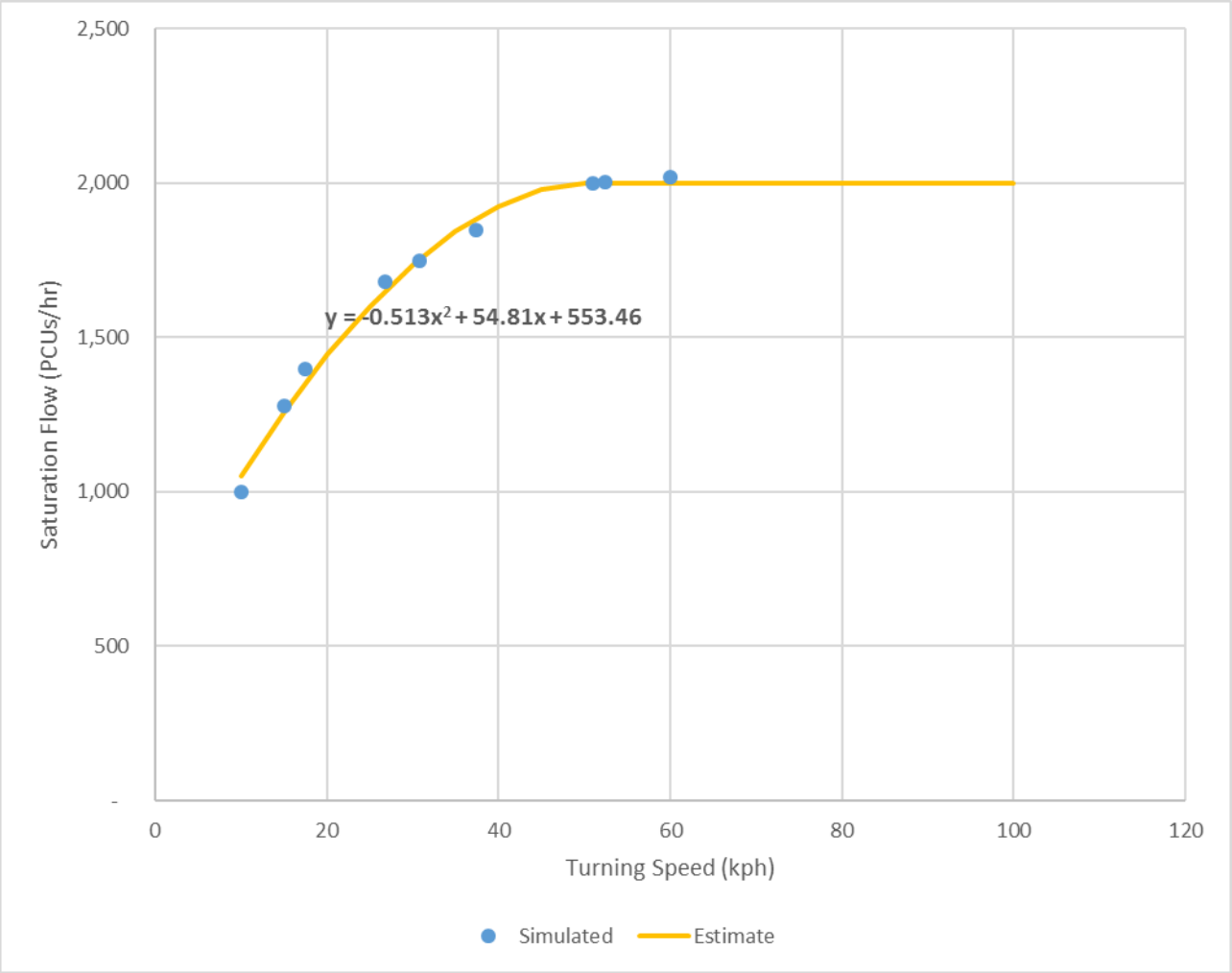
- **Q** = capacity of the turning movement (pcu/hr)
- Q_s = saturation flow at signal for the turning movement (pcu/hr/lane)
- **I** = number of lanes for the turning movement
- **g** = green time for the turning movement
- **C** = cycle time at the signal

[9]Explained in detail in **Chapter 6.1.4**

The saturation flows Q_s were estimated using a simple micro-simulation model, which was visually calibrated to match local turning behaviours over a range of speeds.

Figure 23 shows the line of best fit through the simulated saturation flows for turning speeds between 10 and 50 km/hr, where 10 km/hr is the minimum turning speed applied in ADTA. The saturation flow was capped at 2,000 pcu/hr/lane for turning speeds higher than 50 km/hr.

Figure 23 Adopted Relationship between Signal Saturation Flow and Turning Speed



6.1.3 Intersection Delays – Priority Movements

In ADTA, delays at priority controlled intersections were represented by JDFs. This is because the capacity of priority controlled turns is influenced by the opposing flow, which is easily calculated in a JDF.

Relationships between the capacity of priority movements and the opposing flow were estimated using a linear relationship:

$$Q = Q_s - r \times f_o$$

where:

- Q = capacity of the turning movement (pcu/hr)
- Q_s = saturation flow for the turning movement i.e. capacity of the turning movement at zero opposing flow (pcu/hr); intercept
- r = the rate at which the capacity decreases as opposing flow increases; slope
- f_o = the flow opposing this turning movement (pcu/hr)

The parameters were calibrated for each priority movement to be consistent with the meso intersection calibration results (detailed later in **Chapter 0**). A minimum capacity of 50 pcu/hr was applied to all priority movements.

The resulting turn capacity **Q** was applied to the Akçelik VDF formula from **Chapter 6.1.1** assuming a friction factor of 1.0 to calculate the corresponding turning delay for the priority movement.

Figure 24 shows the calibrated relationship between turn capacity and opposing flow for two give-way controlled movements at a T-intersection on a 2-lane major road (identified by their Turn EID). Turn EID 3309 represents a “Right Turn from Major Road - Across 1 lane” and Turn EID 3313 is a “Right Turn from Minor Road – 2-lane two-way Major Road / Across 1 lane”.

Figure 24 Example of Calibrated Capacity-Opposing Flow Relationship for Priority Movements

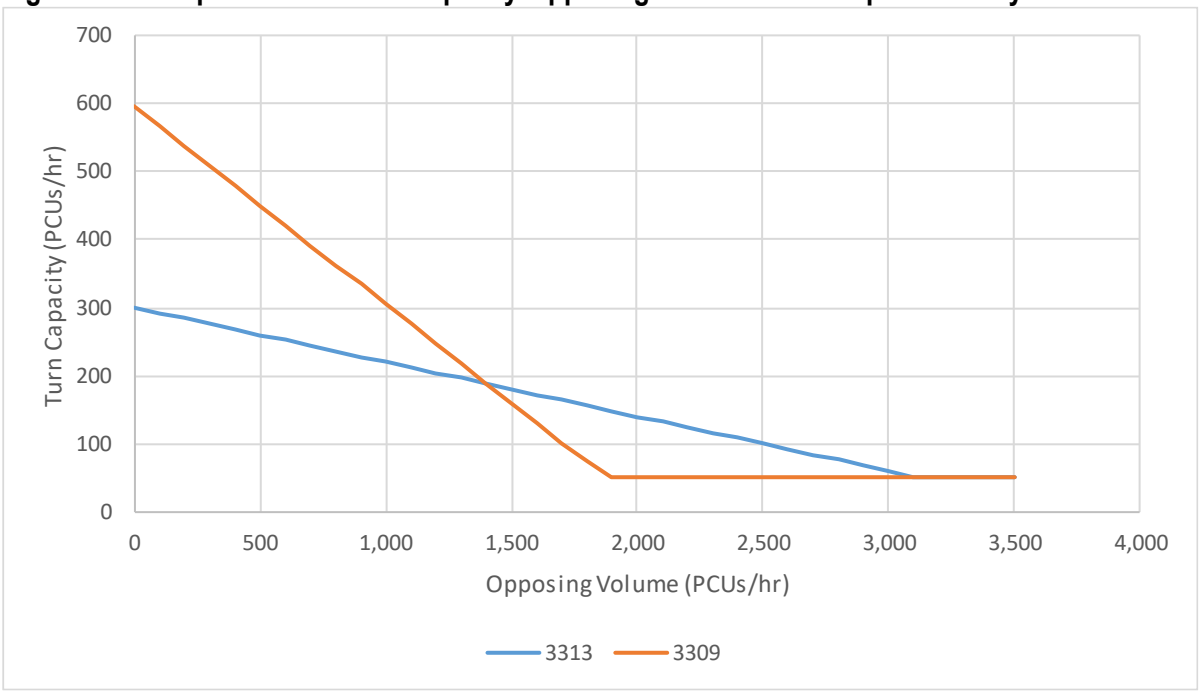


Figure 25 and **Figure 26** below show the resulting static turn delays for the two example priority movements, and also show the corresponding results from the meso and micro models discussed in **Chapter 7**.

Figure 25 Calculated Turn Delay (Turn EID 3309)

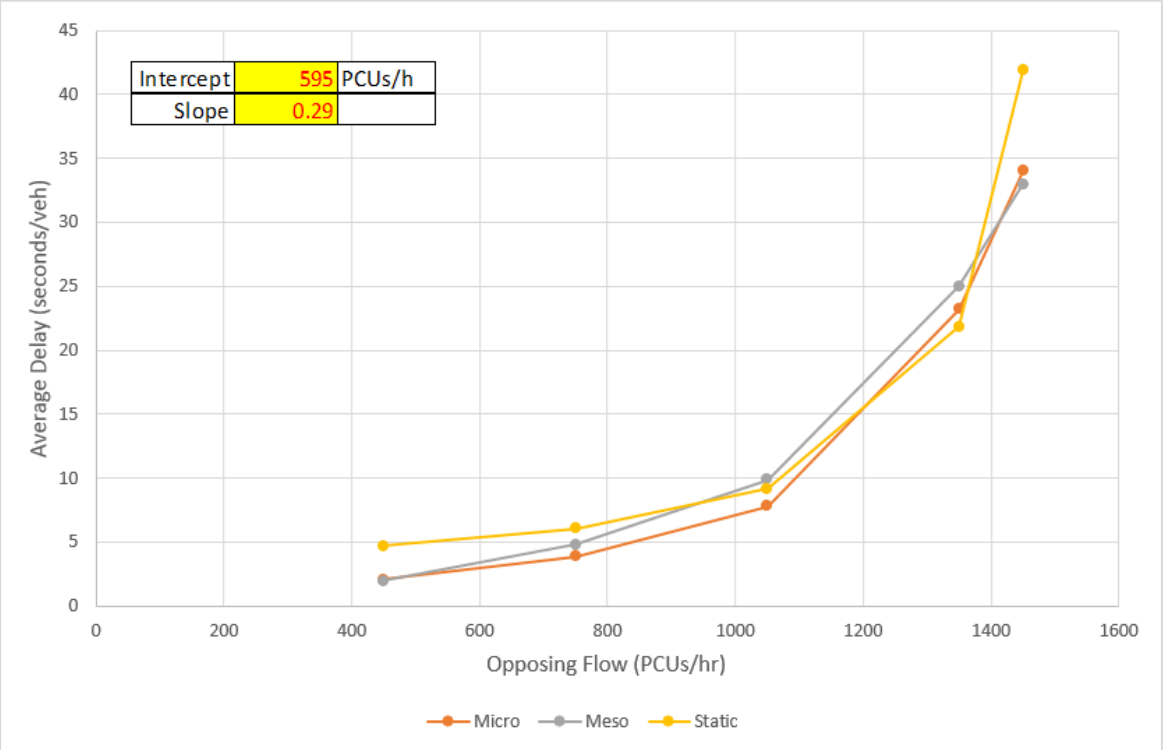
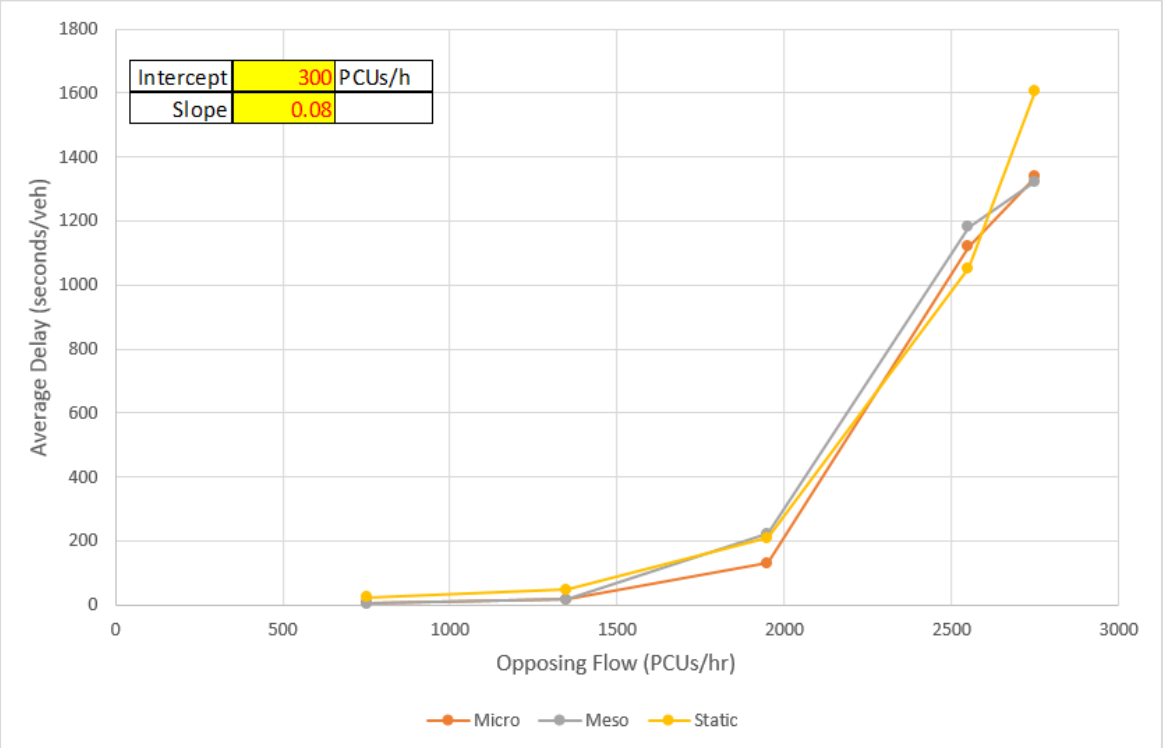


Figure 26 Calculated Turn Delay (Turn EID 3313)



Appendix E provides calibrated capacity intercepts and slopes for all priority turning movement types.

The appropriate parameters were then set for each turn in the model using a Python script based on the Turn EID codes previously described in **Chapter 4.1.3**. These codes were also used to set the conflict matrix at each priority intersection Node.

6.1.4 Motorway Delays – On-ramp Merges

In Auckland, merges at motorway on-ramps operate with equal priority, where mainline motorway traffic and on-ramp traffic 'merge like a zip', rather than on-ramp traffic giving way to mainline traffic. This becomes more pronounced during peak periods where speeds on the mainline drop significantly and on-ramp traffic joins at a higher speed, causing shockwaves and delays on the mainline.

The resulting bottleneck on the mainline was reflected in the static model by modelling the mainline movement as giving way to the on-ramp movement (in line with the meso motorway calibration approach detailed later in Chapter **0**). This was applied through a Python script in Aimsun that automatically detected such nodes and set the conflict matrix accordingly.

Corresponding delays on the mainline were applied using a JDFThe merge capacities were estimated based on a simplified form of the HCM procedure for motorway merges, in line with an approach used in MSM. The steps are summarised as follows:

1. Calculate merge flows:

   $\mathbf{F_{merge} = F_{on} + F_{12}}$

   where:

   $\mathbf{F_{merge}}$ = hourly flow at the merge point

   $\mathbf{F_{on}}$ = hourly flow on the on-ramp

   $\mathbf{F_{12}}$ = hourly flow in lanes 1 and 2 on the mainline approach to the merge

   $\mathbf{F_{12}}$, the hourly flow in lanes 1 and 2, was calculated from the upstream mainline flow (F_{up}) and on-ramp flow ($F_{on\text{-}ramp}$) in accordance with the HCM as follows:

   - F12 = F_{up} where upstream lanes <=2
   - F12 = 0.594 x F_{up} where upstream lanes =3
   - F12 = (0.35 + 0.00012 $F_{on\text{-}ramp}$) x F_{up} where upstream lanes >=4

2. Calculate the merge capacities by reducing the maximum theoretical mainline capacity of 2,100 vph/lane by up to 450 vph/lane, depending on the flow at the merge point. This value was chosen to result in the observed minimum merge capacity of 1,650 vph/lane. This reduction was applied progressively, commencing when merge flows exceeded 3,400 vph and linearly increasing until the full reduction was applied when merge flows reached 4,182 vph. This represents the merge flow in the HCM under a level of service of E.

3. Calculate the delay using the Akçelik VDF formula from **Chapter 6.1.1** with an assumed friction factor $\mathbf{J_A}$ of 0.4.

6.1.5 Motorway Delays – Off-ramp Auxiliary Lanes

The static assignment assumes equal utilisation across all lanes, and therefore the Section capacity used in the Akçelik VDF formula is calculated as the product of number of lanes on the Section and lane capacity (an input Section attribute for each road type).

This assumption becomes inappropriate where the mainline has an auxiliary lane leading only to a motorway off-ramp. In this situation, the utilisation of the auxiliary lane is determined by the off-ramp volume which typically results in a considerably lower capacity than a full mid-block motorway lane.

A simple procedure was developed to address this limitation, summarised below:

1. Calculate the effective number of upstream mainline lanes by adding a proportion of the partial utilisation on the auxiliary lane to the number of downstream mainline lanes, as shown below.

   $$\mathbf{L = L_{down} + F_{off} / N_{off} / Q_{off}}$$

   where:

$\mathbf{L}$	=	effective number of upstream mainline lanes
$\mathbf{L_{down}}$	=	number of downstream mainline lanes
$\mathbf{F_{off}}$	=	hourly flow on the off-ramp
$\mathbf{N_{off}}$	=	number of off-ramp lanes
$\mathbf{Q_{off}}$	=	off-ramp lane capacity (i.e. 1,800)

2. Use this effective number of lanes, **L**, to calculate the Section capacity, **Q** on the upstream mainline Section.

3. Calculate the delay using the Akçelik VDF formula from **Chapter 6.1.1** with an assumed friction factor $\mathbf{J_A}$ of 1.0.

These delays were applied as JDFs for through movements on the motorway mainlines immediately upstream of off-ramps with lane drops.

6.1.6 Section Distance Component

The distance component of the generalised cost reflects perceived vehicle operating costs, and helps stabilise the assignment iterations. Its formulation is as follows:

$$\mathbf{d = d_V \times d_R \times L \times 60}$$

where:

$\mathbf{d}$	=	distance component of the generalised cost (minutes)
$\mathbf{d_V}$	=	distance factor based on vehicle type (minutes per km)
$\mathbf{d_R}$	=	distance factor based on road type (unitless ratio)
$\mathbf{L}$	=	length of the Section (km)

The vehicle type distance factor $\mathbf{d_V}$ was set to 0.4 mins/km for cars and 1.0 mins/km for trucks respectively, in line with MSM.

An additional factor by road type $\mathbf{d_R}$ was introduced to reflect the subjective biases in route choice inferred from the observed counts. It encompasses factors influencing route choice such as perceived comfort, directness and safety, road signage and drivers' habits. The road type distance factors are summarised in the road hierarchy table in **Chapter 6.1.1.**

The base model currently does not include a toll component. As indicated in **Chapter 9.2.2**, toll component will need to be added to both static generalised cost and dynamic cost function for future scenarios that includes road pricing. Distance based tolls will appear in the distance component.

6.1.7 Peaking Factors

The static generalised cost calculations, including the Akçelik VDF calculation that was adopted in ADTA, use average hourly input flows to estimate the average travel times over the model duration. This approach is suitable for strategic models where model durations are one or two hours and the traffic conditions remain relatively consistent.

However, for ADTA, where both the AM and PM peak period model durations are four hours, producing the correct average speed response for given four hour average input flows was challenging as the relationship between peak hour speed-flow and four hour speed-flow is not linear.

This led to period-specific peaking factors being applied to the demand flow term, **q**, in the Akçelik VDF formula. . Peaking factors from the traffic profiles were used as a starting point, but these factors were calibrated through trial-and-error.

MODEL PERIOD	PEAKING FACTOR
AM	1.14
IP	1.00
PM	1.16

6.2 Model Parameters

6.2.1 Vehicle Parameters

The only vehicle parameter used for the static assignment is the Passenger Car Unit (PCU) factor for each vehicle type. This is the effective number of passenger cars that each vehicle type is estimated to be equivalent to on the road network.

VEHICLE TYPE	PCU FACTOR
CAR	1.0
TRUCK	1.9
BUS	2.5

Buses are allocated fixed routes and do not form part of the static assignment. Their volumes in PCU's are added to the total volumes.

6.2.2 Static Assignment Parameters

The following Aimsun static assignment parameters were applied to ADTA:

ASSIGNMENT PARAMETER	VALUE
ASSIGNMENT METHOD	Method of Successive Averaging (MSA)
CONVERGEANCE CRITERIA - RGAP	1.0%
CONVERGENACE CRITERIA – MAX ITERATION	100

The MSA assignment method was selected as it was found to converge faster and more smoothly than the Frank and Wolfe method. This is because the cost functions include responses to opposing flows that result in more instability in costs and assigned flow between iterations.

6.3 Static Assignment Convergence

The final static assignment for each of three model periods was stable and reached the relative gap (rgap) before reaching the maximum iterations. Paths from these assignments were used as the initial paths in the dynamic assignments in the meso tier.

Figure 27 AM Peak Static Assignment Convergence

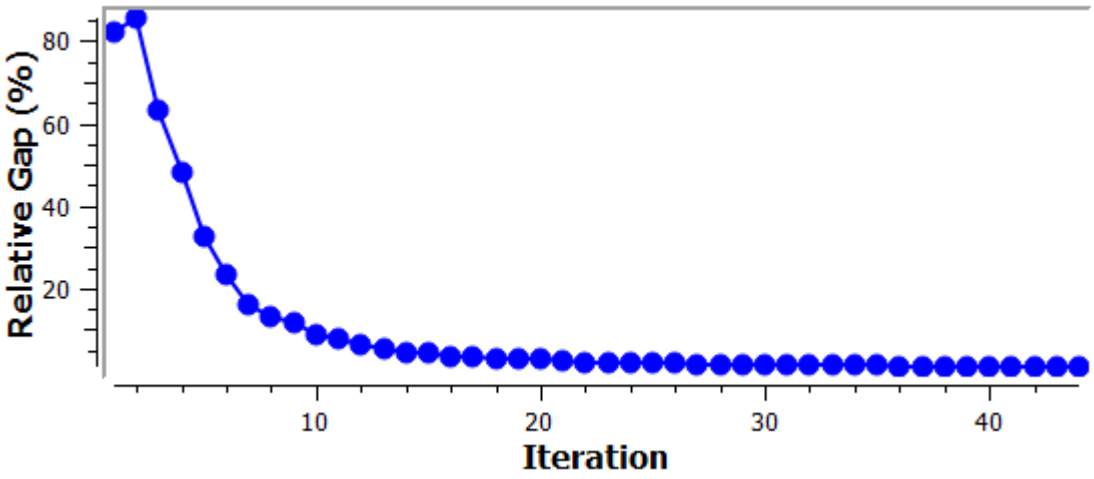


Figure 28 Inter-peak Static Assignment Convergence

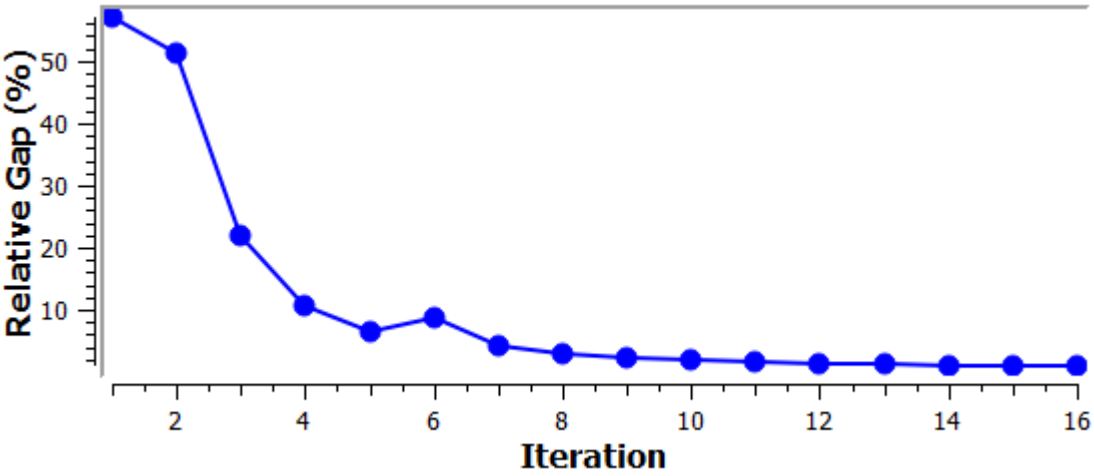
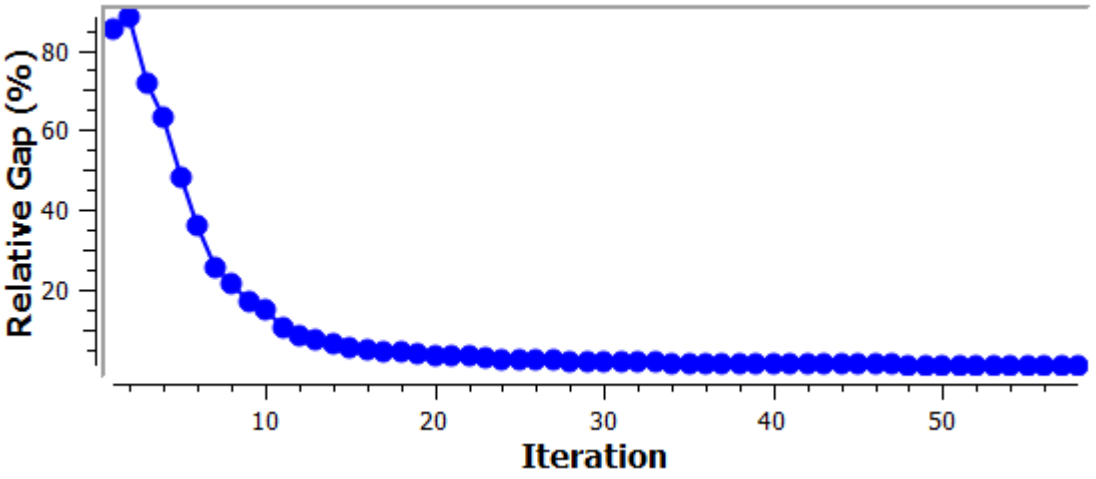


Figure 29 PM Peak Static Assignment Convergence



7 Meso DTA Calibration

The meso DTA is a simplified vehicle simulation with limited ability to replicate some behaviour and outcomes when compared with a microscopic model. However, due to its regional scale, ADTA was developed as a meso DTA model only, and does not include any microsimulation. Calibration of the meso DTA has been the focus of model development.

In ADTA, the meso model was calibrated based on the following principles:

- Calibrate to observed behaviour where observed data is available
- Calibrate to match microscopic model behaviour in the absence of observed data
- Focus on how the model responds to changes in demand and network to provide confidence in forecasting

The majority of situations were appropriately modelled by adjusting the default meso parameters. However, in some cases the default functions were unable to satisfactorily represent known behaviours and new approaches were developed for ADTA.

This chapter provides details of the meso model calibration.

7.1 Dynamic Cost Functions

The Dynamic Cost Function (DCF) in ADTA includes travel time and travel distance components. The travel time component is based on the experienced travel time on the 'Link'[10]. The attractiveness in the default Aimsun DCF was replaced with a distance component in ADTA

Parameters relevant to the calculation of travel time and the DCF are discussed in the following sections.

7.1.1 Jam Density

In the Aimsun meso model, jam density specifies the physical capacity of a section as the number of vehicles that can fit into each kilometre when queued.

The default jam density in Aimsun is 200 veh/km and the initial results showed that this was too high for Auckland. Jam density was estimated for ADTA using the observed vehicle composition and vehicle lengths for Auckland. Its calculation is summarised below:

[10] In Aimsun, a "Link" refers to a turn and its immediate prior Section

	CAR	LCV	MCV	HCV1	HCV2
VEHICLE TYPE COMPOSITION[11]	91.2%	3.0%	3.2%	1.2%	1.5%
AVERAGE VEHICLE LENGTH[12] **(m)**	4.5	5	8.3	15	19.4
AVERAGE VEHICLE STORAGE[13] **(m)**	6	6.5	9.8	16.5	20.9
WEIGHTED AVERAGE VEHICLE STORAGE (m)			6.5		
JAM DENSITY (veh/km)			154		

The jam density was also calculated using the vehicle composition from motorway ramps only, and based on the composition from NZTA's Economic Evaluation Manual (EEM). These resulted in jam density values of 157 and 153 veh/m respectively, indicating a good level of consistency. The average over these three values of155 veh/m was adopted as the jam density in ADTA.

7.1.2 Gap-Acceptance Parameters

The meso gap-acceptance model is a simplification of the microscopic gap-acceptance model.

In the ADTA, the meso gap-acceptance parameters, namely initial safety margin, final safety margin and give-way time factor, were calibrated to match microscopic model behaviour. The process can be summarised as follows:

1. A SIDRA intersection model was developed for each of the following priority-controlled intersection types:
   - T-intersection with 2-lane major road, controlled by give-way sign
   - T-intersection with 2-lane major road, controlled by stop sign
   - T-intersection with 2-lane major road with flush median in the middle, controlled by give-way sign
   - T-intersection with 2-lane major road with flush median in the middle, controlled stop sign
   - Crossroads with 2-lane on major road, controlled by stop signs
   - T-intersection with 4-lane major road, controlled by give-way sign
   - T-intersection with 4-lane major road, controlled by stop sign
   - T-intersection with 4-lane major road with flush median in the middle, controlled by give-way sign
   - T-intersection with 4-lane major road with flush median in the middle, controlled stop sign
   - Crossroads with 4-lane major road, controlled by stop signs
   - T-intersection with 6-lane major road, controlled by stop sign
   - T-intersection with 6-lane major road with flush median in the middle, controlled by stop sign

[11] Based on classified TMS AADT count data across Auckland's motorway network
[12] Based on Table 3.5 in NZTA's research paper, **Derivation of Appropriate Traffic & Loading Data, and Parameters for Road Asset Management (2005, Transfund)**
[13] Vehicle storage is calculated as vehicle length plus 1.5m clearance

2. Use the SIDRA models to estimate delays and queue lengths for each priority movement over a range of major road flows.
3. Build standalone intersection models in Aimsun for each intersection type.
4. Calibrate the microscopic gap-acceptance parameters for each priority movement using the SIDRA results over a range of major road flows and visual inspection.
5. Calibrate the meso gap-acceptance parameters to match the microscopic delays for each priority movement over a range of major road flows.

An example of the outcomes from this calibration process is provided below. **Figure 30** shows the calibrated micro and meso gap-acceptance parameters for priority movements at a T-intersection with a 2-lane major road and give-way control.

Figure 31 shows the resulting micro and meso turn delays from Aimsun for a “Right Turn from Major Road - Across 1 lane” at this intersection (Turn EID 3309).

Figure 30 Example Calibrated Gap-Acceptance Parameters

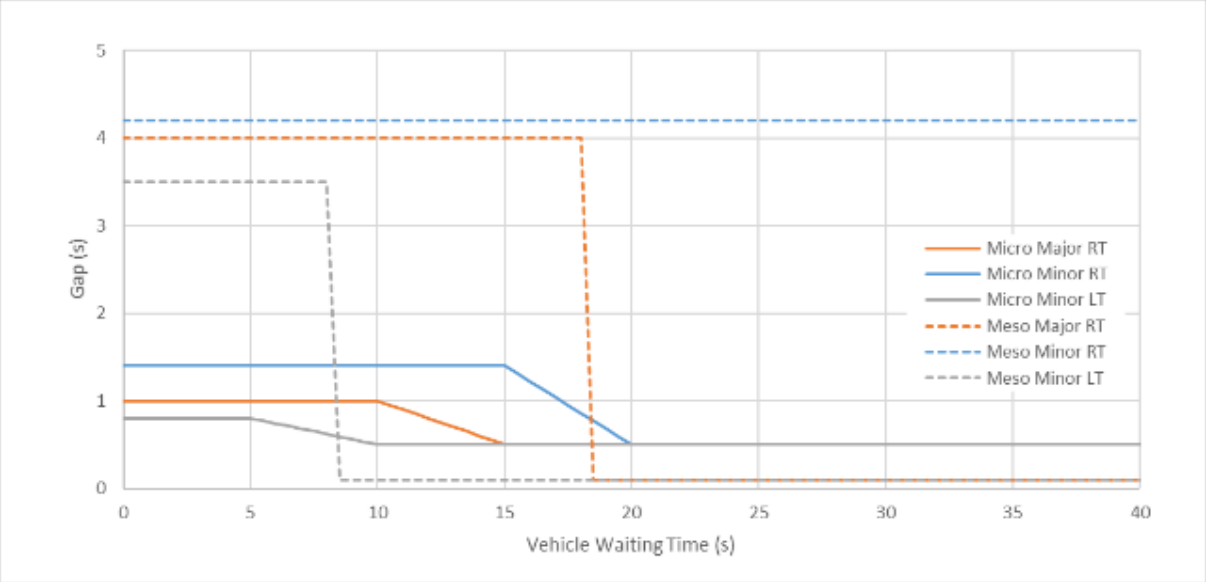
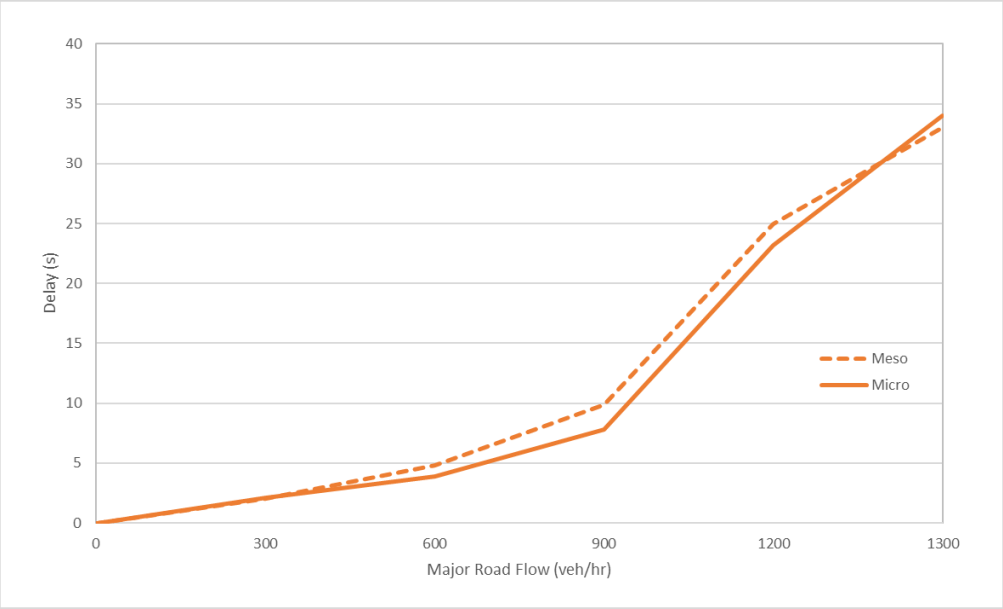


Figure 31 Example Turn Delay (Turn EID 3309)



Appendix F provides the calibrated meso gap-acceptance parameters for all priority intersection types.

7.1.3 Distance Component

The distance component used in the DCF is the same as that used in the static generalised cost calculation. This was discussed in detail in **Chapter 6.1.6**. Broadly, it reflects perceived vehicle operating costs using a cost per km of travel for each vehicle type; and also includes a multiplier by road type to represent subjective factors influencing route choice such as perceived comfort, directness, safety, road signage and driver' habits.

7.2 Meso Motorway Calibration

Because of significant limitations with the default motorway behaviour in the Aimsun mesoscopic model, an alternative approach was developed for ADTA. This chapter provides a summary of the calibration approach. A separate technical note **ADTA – Special Motorway Coding** provides full details of the approach and rationale.

7.2.1 Limitations of Default Mesoscopic Model

In the Aimsun mesoscopic model, a motorway Section will form a bottleneck blocking all upstream lanes if one of its lanes reaches the Maximum Flow. This makes it very important to model individual lane flows accurately.

However, the modelled lane flows rely on a built-in lane change model that cannot be calibrated by the modeller. With this model, vehicles only change lanes if the density of the current lane in the downstream section is higher than some unknown penalty (hidden from the modellers) or they are required to change lanes to make a turn. With no ability to influence the lane changing response to lane density it is impossible to accurately model the motorway flows by lane.

Because of this, the initial meso assignment results using the default motorway behaviour produced counter-intuitive and inconsistent responses that did not represent known bottlenecks, while creating others where they did not exist.

The recommended approach to calibrate this in Aimsun is to adjust the Reaction Time Factor on these Sections to reproduce observed queuing and delay. However, this does not address the underlying issue. As such, to achieve calibration required overfitting of this factor for every motorway interchange and for every peak.

Because the model is not actually representing the underlying behaviour leading to the observed situation, it could not be relied on to forecast the response for a future scenario with different traffic flows. Any scenario would technically require the Reaction Time Factors on the motorway Sections to be adjusted from the calibrated values to produce realistic results, but the model itself is intended to provide us with the understanding of realistic motorway performance for that future scenario. Additionally, this model could not be used objectively to represent a future motorway or interchange that could not be calibrated to observations. This was deemed too great a limitation for forecasting.

This was discussed with Aimsun Pty and the suggested approach was to include a micro-simulation subarea over the motorway network to enable calibration of motorway behaviour. However, a test showed that the resulting hybrid model would have a run-time of 37 hours for a single peak period rendering it impractical.

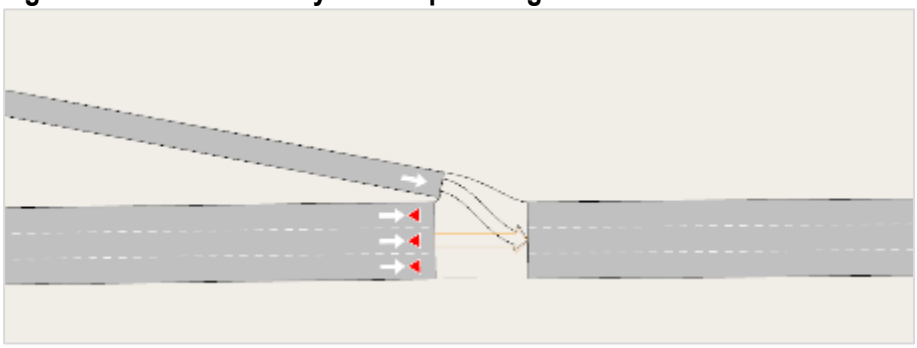
Therefore, an alternative approach for modelling motorway behaviour in the meso model was developed for ADTA that enabled a consistent methodology to be applied across the whole motorway network for all scenarios.

Note that this issue is not as important on local roads where lane changes and delays are primarily associated with intersections rather than lane density and these are adequately represented in the calibrated meso model.

7.2.2 ADTA Approach

The methodology used in ADTA includes the unorthodox coding of on-ramp merges with the mainline movement giving way to the on-ramp movement as shown in **Figure 32**. Meso gap-acceptance parameters could then be calibrated for different onramp situations.

Figure 32 ADTA Motorway On-ramp Coding



A set of 4-digit Turn EID codes were used to signify different on-ramp situations, similar to those specified in **Chapter 4.1.3**.

X		INTERSECTION TYPE
	7	Motorway On-Ramp Merge
Y		**NOT USED**
ZZ		**ON-RAMP TYPE**
	01	On-ramp merge with 2 lane mainline, including on-ramp as lane gain with downstream mainline lane drop
	02	On-ramp merge with 3 lane mainline, including on-ramp as lane gain with downstream mainline lane drop
	03	On-ramp merge with 4 lane mainline, including on-ramp as lane gain with downstream mainline lane drop
	04	On-ramp merge with 5 lane mainline, including on-ramp as lane gain with downstream mainline lane drop
	11	On-ramp as lane gain with 2 lane mainline, without mainline lane drop downstream
	12	On-ramp as lane gain with 3 lane mainline, without mainline lane drop downstream
	13	On-ramp as lane gain with 4 lane mainline, without mainline lane drop downstream
	20	Centre lane equal priority merge where both on-ramp and mainline have 2 lane each

The calibrated meso gap-acceptance parameters are provided in **Appendix G**.

The underlying lane choice still occurs in the Aimsun mesoscopic model which means that individual lanes can still unrealistically block upstream Sections. To limit the impact of this in ADTA, the motorway mainline Sections were shortened to50 - 100 metres so that vehicles could progressively make lane changes to desired downstream turns. This limits the volume

shifting into the required downstream lane at any one location and reduces the likelihood of that lane reaching capacity and blocking the upstream Section unrealistically.

Under this approach, the same Reaction Time Factors and Turn Look-ahead Distances can be applied for a given situation across the whole motorway network. These are summarised below.

MOTORWAY SITUATION	REACTION TIME FACTOR
MOTORWAY-MOTORWAY INTERCHANGES: SINGLE LANE MOTORWAY AND RAMP SECTIONS WITHOUT ANY FORM OF CONTROL DOWNSTREAM	1.15
3 TO 2 LANE MAINLINE MERGE	1.5
4 TO 3 LANE MAINLINE MERGE	1.3
5 TO 4 LANE MAINLINE MERGE	1.1
SHORT MAINLINE SECTIONS DOWNSTREAM OF THE ON-RAMP MERGE NODE	0.1
MAINLINE SECTIONS UPSTREAM OF THE OFF-RAMP NODE, UNTIL THE IMMEDIATE UPSTREAM ON-RAMP MERGE NODE	0.5

MOTORWAY SITUATION	TURN LOOK-AHEAD DISTANCE (m)
MOTORWAY DEFAULT	50
MAINLINE LANE DROP	1,000
OFF-RAMP	In increments of 250 up to 1,000 based on the distance to the upstream on-ramp

7.3 Reaction Time Factors

Localised adjustments to Reaction Time Factors were minimised due to the structured calibration approach adopted in ADTA as described in the previous chapters. Only three additional locations required localised adjustment to account for unusual horizontal curvature and vertical gradient.

7.4 Assignment Parameters

This chapter provides a summary of meso assignment parameters adopted in the ADTA.

7.4.1 Vehicle Parameters

GLOBAL SETTINGS	VALUE		
REACTION TIME AT STOP (s)	1.20		
REACTION TIME AT SIGNALS (s)	1.60		
JAM DENSITY (veh/m)	155		
VEHICLE LENGTH (m)	**MEAN**	**MINIMUM**	**MAXIMUM**
CAR	4.5	4.0	5.3
TRUCKS	11.0	8.0	18.0
CLEARANCE (m)	**MEAN**	**MINIMUM**	**MAXIMUM**
CAR	1.5	1.0	2.3
TRUCKS	1.5	1.0	2.5
MAXIMUM GIVE WAY TIME (S)	**MEAN**	**MINIMUM**	**MAXIMUM**
CAR	10	5	15
TRUCKS	25	10	35

7.4.2 Dynamic Assignment Parameters

PARAMETERS	VALUE
CYCLE (hh:mm:ss)	00:15:00
NUMBER OF INTERVALS	1
ATTRACTIVENESS WEIGHT	0.0
USER-DEFINED COST WEIGHT	1.0
PATH COST CALCULATION	Experienced
DUE MODEL	Gradient-based
ENROUTE AFTER VIRTUAL QUEUE	No
DO NOT CONSIDER A PATH WITH A PERCENTAGE BELOW (%)	5
STOPPING CRITERIA – RGAP (%)	2
STOPPING CRITERIA - MAX ITERATION	50
MAXIMUM NUMBER OF INITIAL PATHS TO CONSIDER	2
CALCULATE ADDITIONAL PATHS	Yes
MAXIMUM PATHS PER INTERVAL	By Vehicle Type
▪ CAR-SOV	3
▪ CAR-HOV	3
▪ TRUCK	2

7.5 Dynamic Assignment Convergence

The final meso DUE assignment for each of the three model periods was stable and reached the desired rgap (2% for AM and PM, 1% for IP) within 50 iterations.

Figure 33 AM Peak Meso DUE Convergence

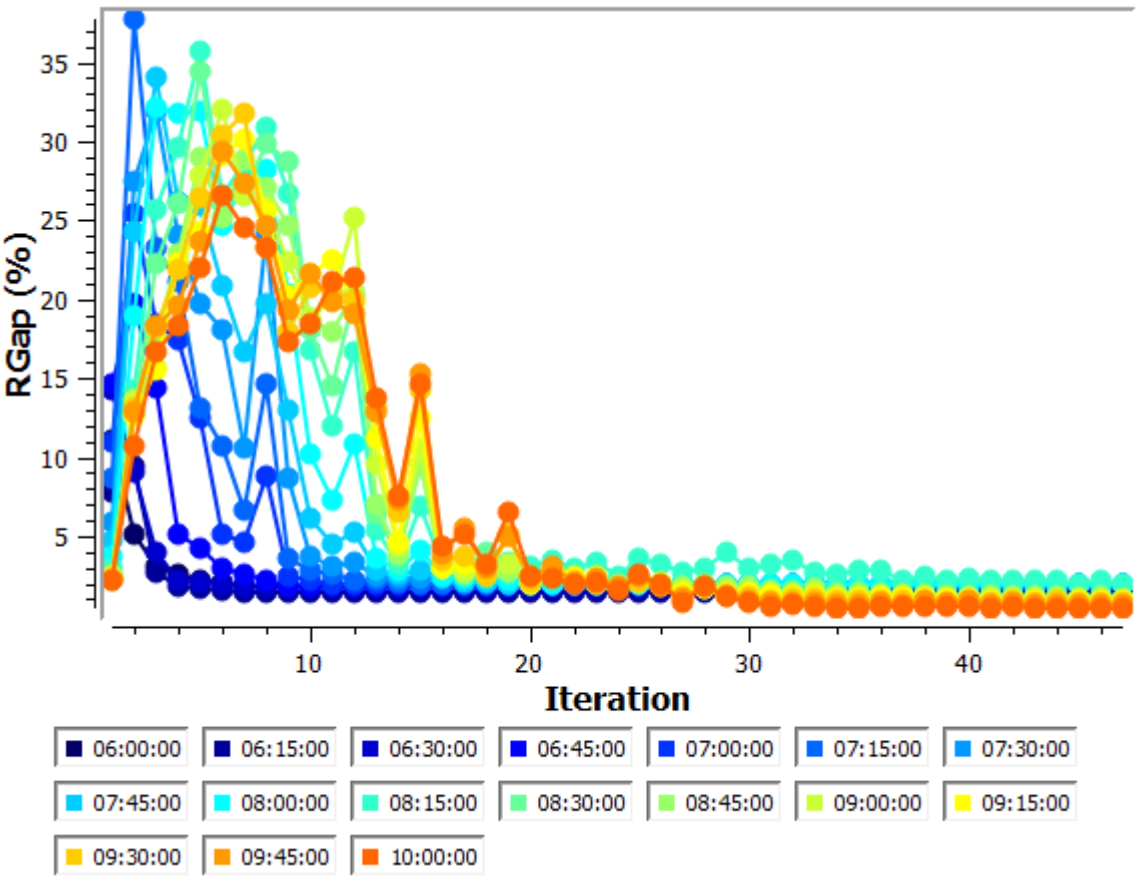


Figure 34 Inter-peak Meso DUE Convergence

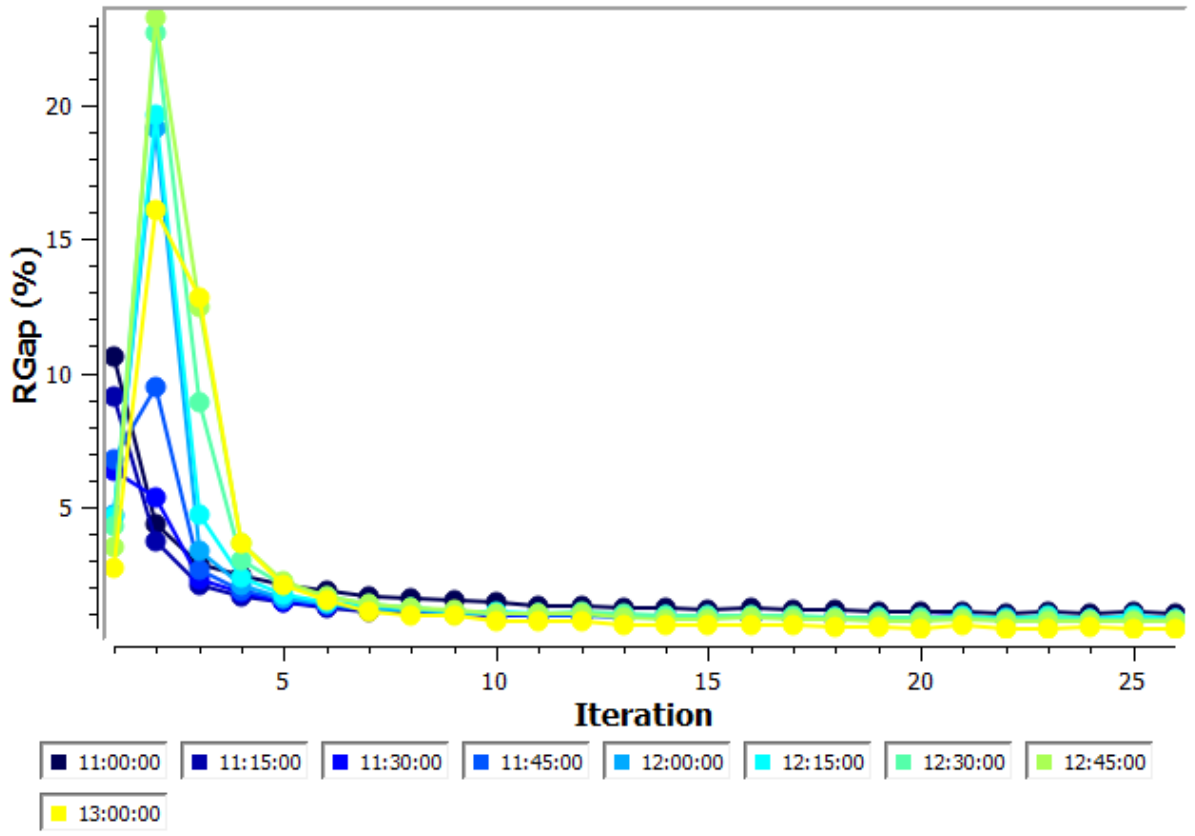
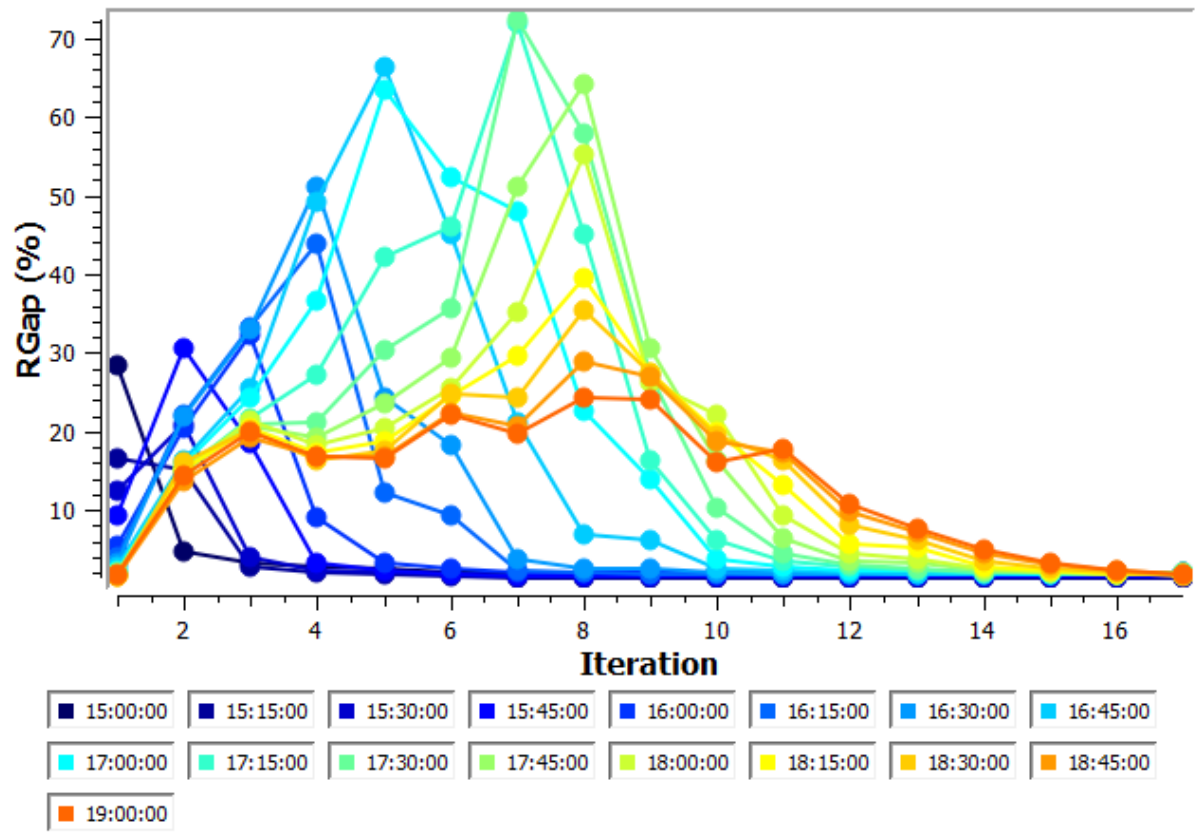


Figure 35 PM Peak Meso DUE Convergence



8 Calibration and Validation Results

8.1 General Approach

ADTA has been calibrated with reference to criteria for a "Category A: Regional Transport Model" from **NZTA Model Development Guidelines** ("criteria"). This category is typically applied to regional macro demand models. ADTA is a dynamic model of regional scale and therefore it was considered that dynamic validation against these criteria was appropriate.

Calibration and validation was undertaken for each hour covering the middle two hours of AM and PM peak periods and the two hour interpeak period.

The focus of calibration and validation were screenline totals, individual link flows on screenlines, and travel times on key routes.

Adjustments to demand and network during the calibration process were carefully considered with respect to implications on model response and forecasting. Deficiencies against statistical criteria were tolerated in preference to overfitting ADTA to the available data.

8.2 Screenline Total Calibration

Results from the screenline total calibration show that the model meets the criteria for both hours in the inter-peak and PM peak, but not in the AM peak.

Summary of Screenline Total Calibration Results

	AM		IP		PM		NZTA GUIDELINE
	7- 8	8 - 9	11 - 12	12 - 1	4 - 5	5 - 6	Category A
GEH <5	46%	46%	84%	66%	78%	72%	**>60%**
GEH <7.5	66%	58%	96%	80%	86%	90%	**>75%**
GEH <10	80%	76%	98%	92%	90%	96%	**>90%**
GEH <12	90%	86%	100%	98%	92%	96%	**N/A**
R^2	1.00	0.99	1.00	1.00	1.00	1.00	**N/A**

The deficiencies in the AM peak screenline flows were thoroughly investigated and considered to be due to problems with input demands from MSM and departure time profiles in the AM peak period with significantly more pronounced peaking than the other two periods. Adjustments to demands and departure profiles were tested but a satisfactory solution could not be identified. It was concluded that further adjustments to the AM peak trip distribution and profiles required observed trip data by time slice, which was not available.

8.3 Individual Link Counts Validation

Results for individual link counts show that ADTA do not satisfy the validation criteria for GEH but do satisfy the standard for R^2 and RMSE.

Summary of Individual Link Counts Validation Results

	AM		IP		PM		NZTA GUIDELINE
	7- 8	8 - 9	11 - 12	12 - 1	4 - 5	5 - 6	Category A
GEH <5	54%	46%	55%	58%	51%	48%	**>65%**
GEH <7.5	71%	63%	76%	76%	68%	67%	**>75%**
GEH <10	82%	77%	88%	86%	81%	78%	**>85%**
GEH <12	88%	85%	93%	90%	86%	87%	**>95%**
R^2	0.94	0.93	0.96	0.96	0.95	0.95	**>0.85**
RMSE	31%	30%	26%	26%	27%	26%	**<30%**

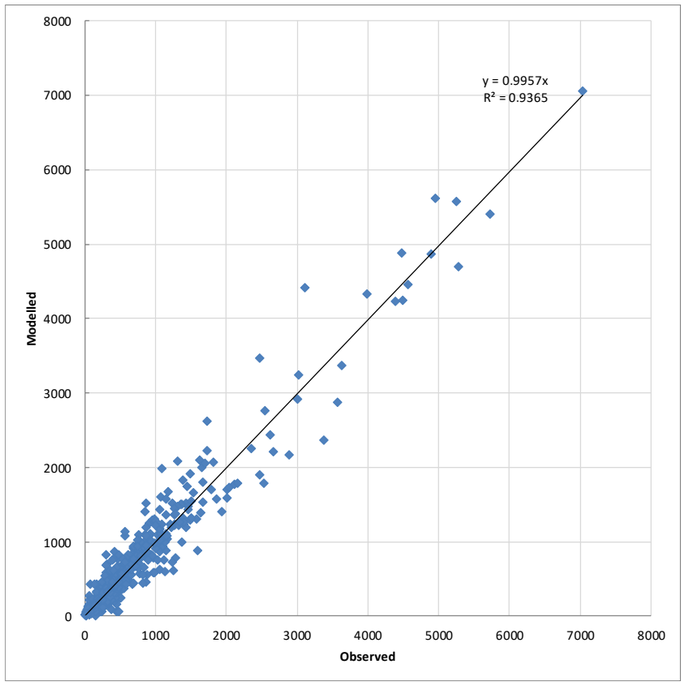
Considerable time was spent analysing select link outputs to understand demand and route choice across screenlines and it was considered that the assignment of traffic between alternative routes was generally well represented by ADTA. To address deficiencies in individual link counts would require large changes in profiled demand and data to support these changes, as noted in **Chapter 5.2**.

Full link counts validation results are provided in **Appendix H**.

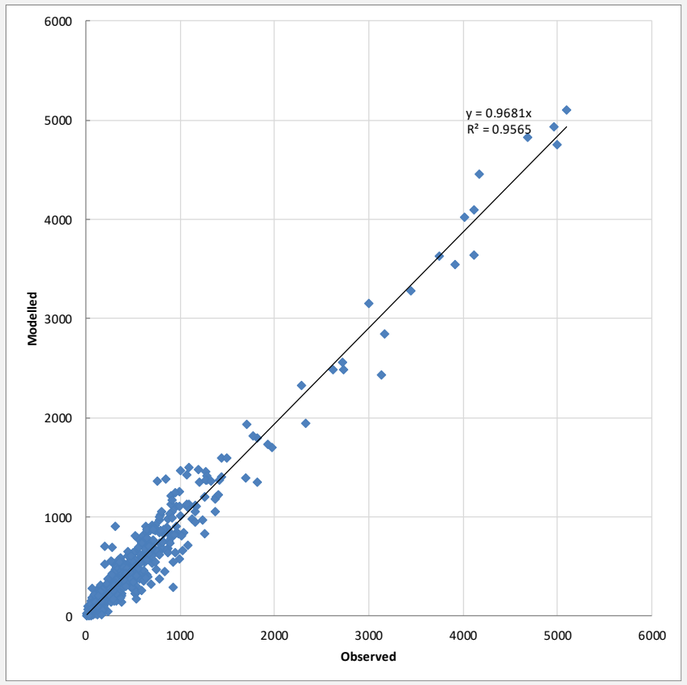
Following figures show the scatter plots between the observed and modelled link counts.

Figure 36 Individual Link Counts Validation Scatter Plots

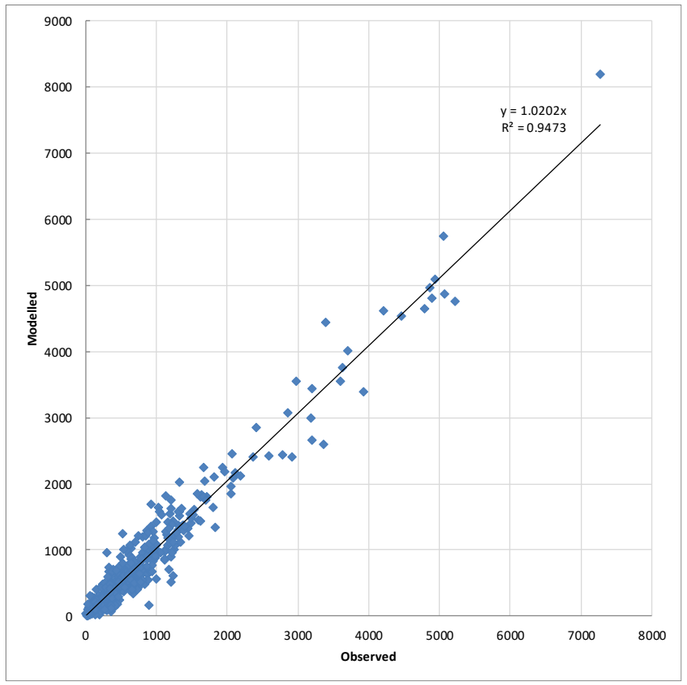
AM Peak 7 – 8am



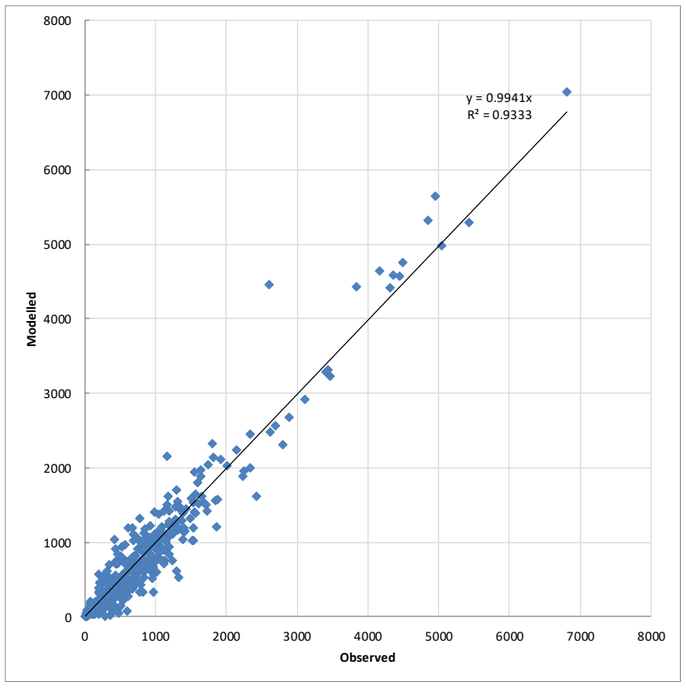
Inter-peak 11am – 12pm



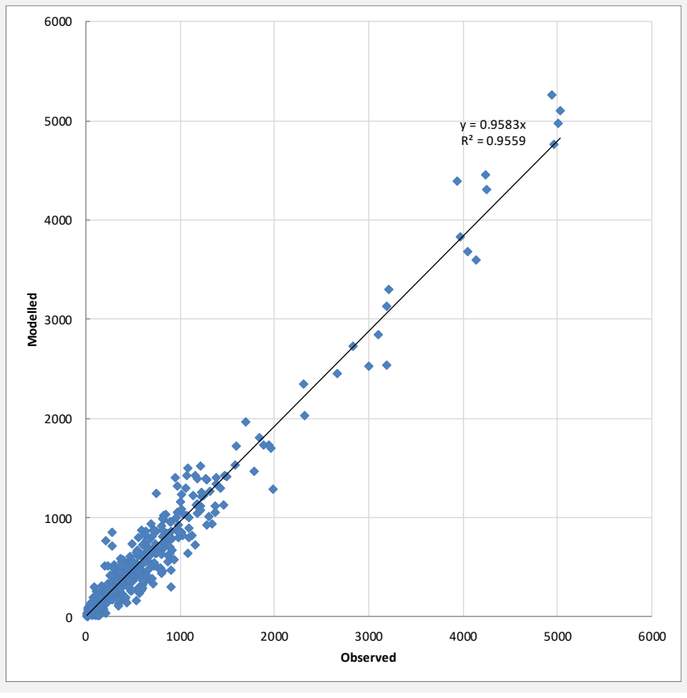
PM Peak 4 – 5pm



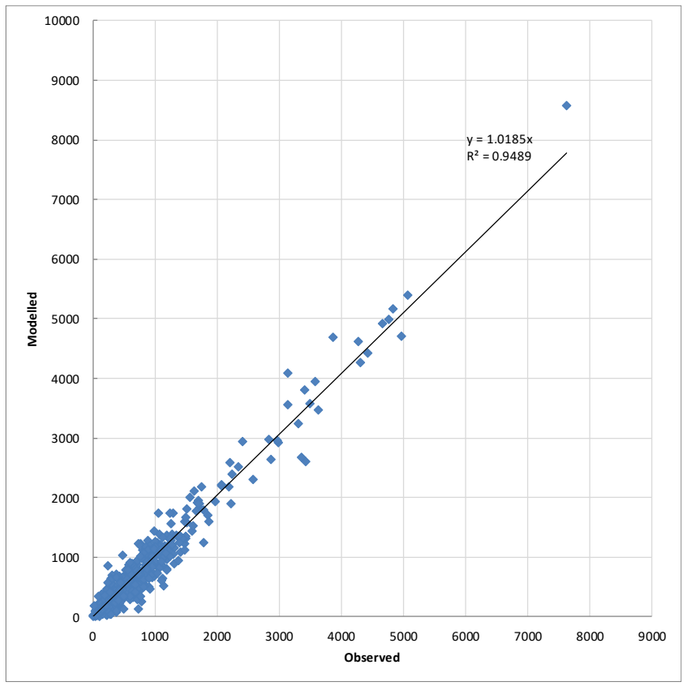
AM Peak 8 – 9am



Inter-peak 12 - 1pm



PM Peak 5- 6pm



8.4 Flow Profile Validation

This chapter provides modelled and observed traffic flow profiles for 14 key locations around the region. Whilst not forming part of the statistic criteria for model development, it provides a good visual assessment of ADTA time sliced demand and throughput.

Figure 37 Profile Validation Locations

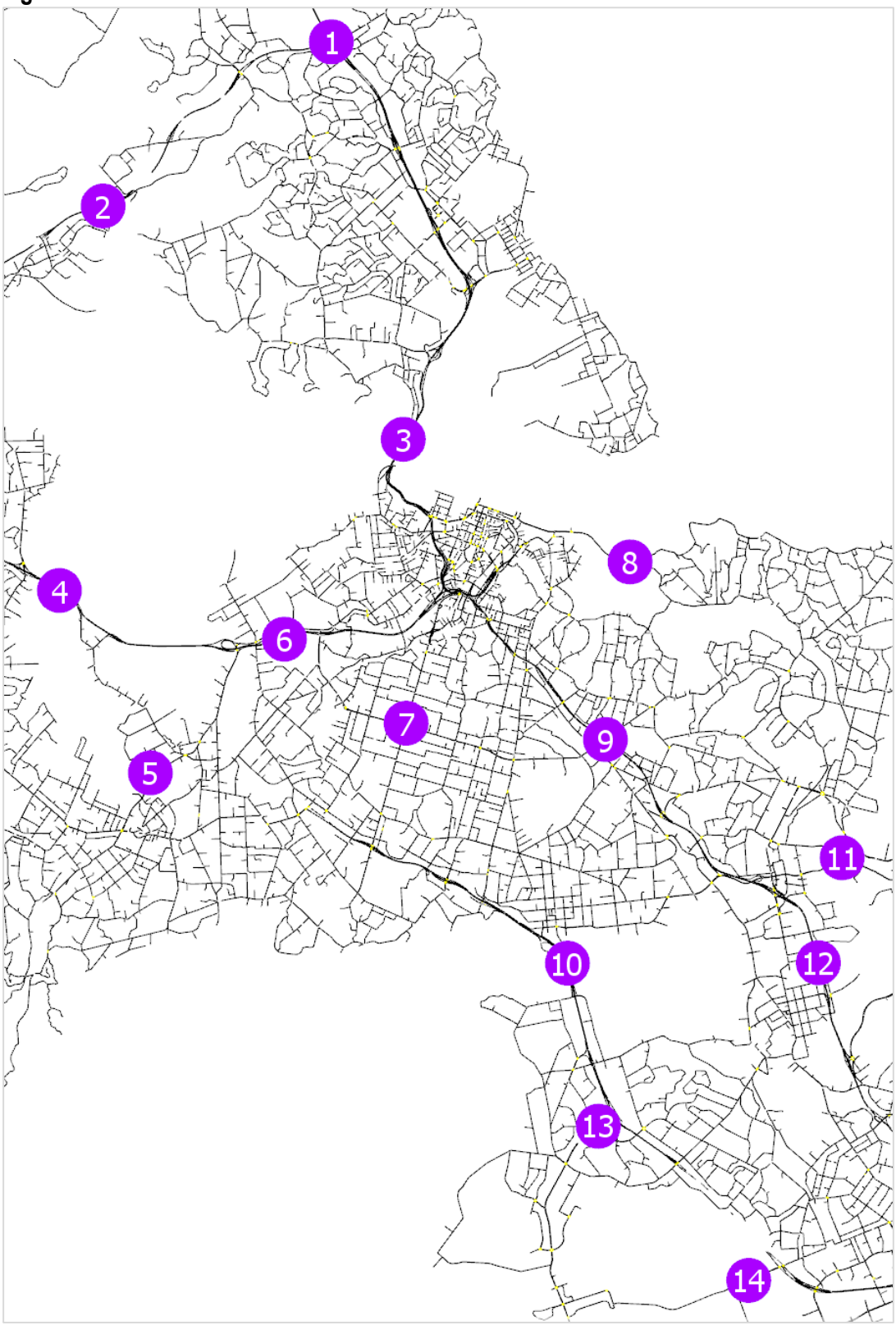
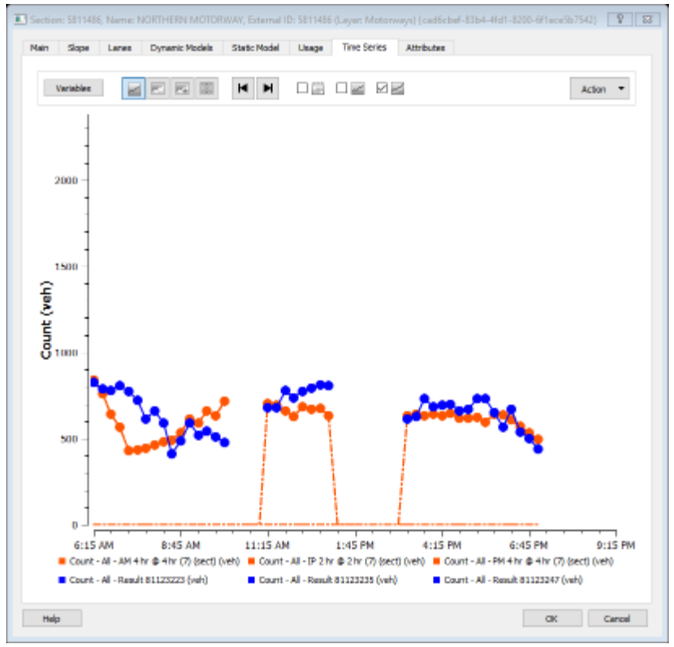


Figure 38 Traffic Profile Validation (modelled in blue and observed in orange)

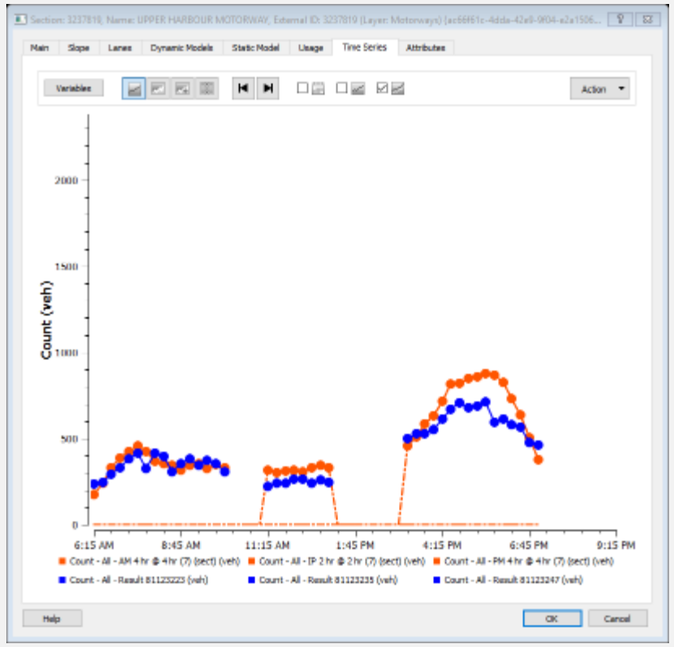
1 – Northern SH1 at Constellation Drive Interchange

Southbound



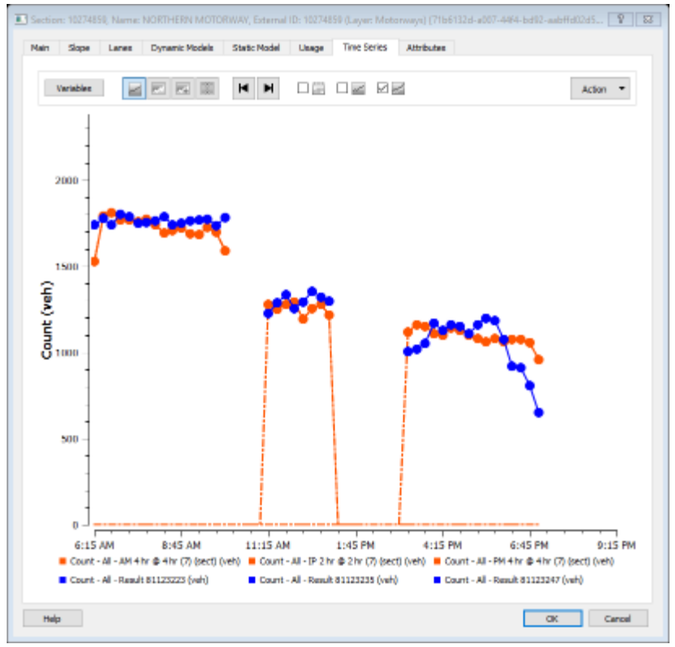
2 – SH18 Upper Harbour Bridge

Westbound

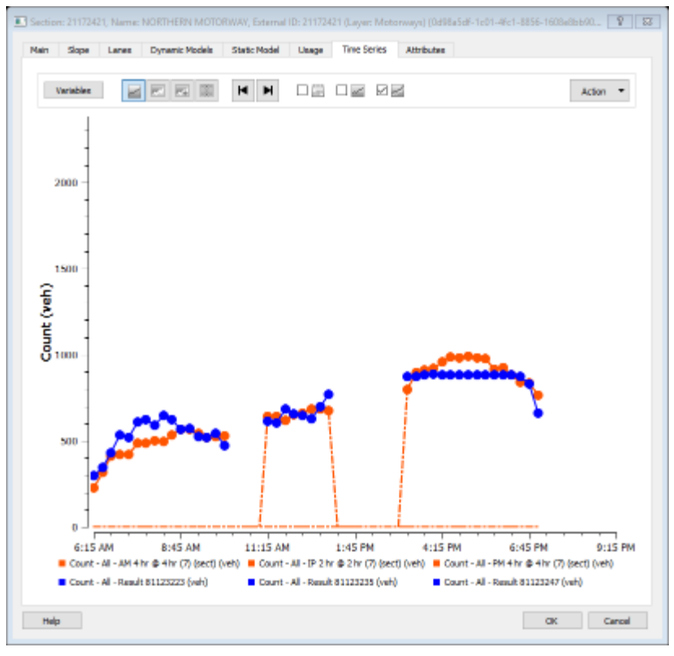


3 – SH1 Harbour Bridge

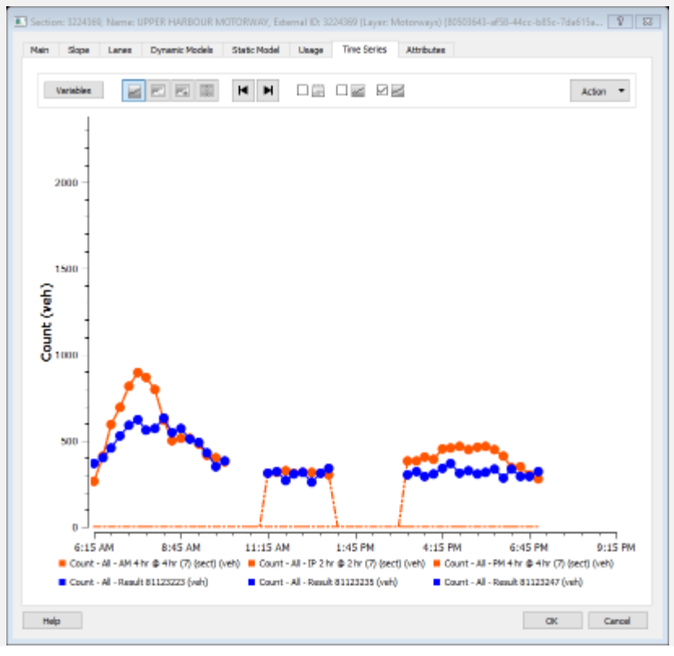
Southbound



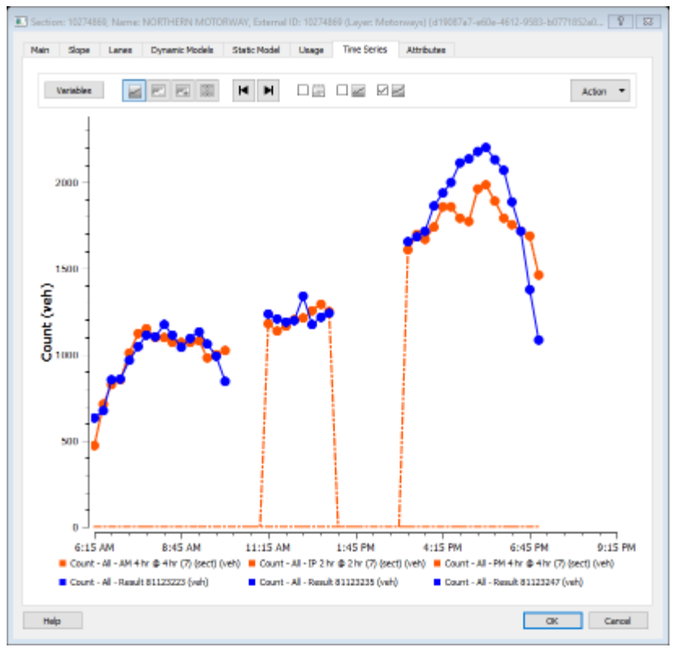
Northbound



Eastbound

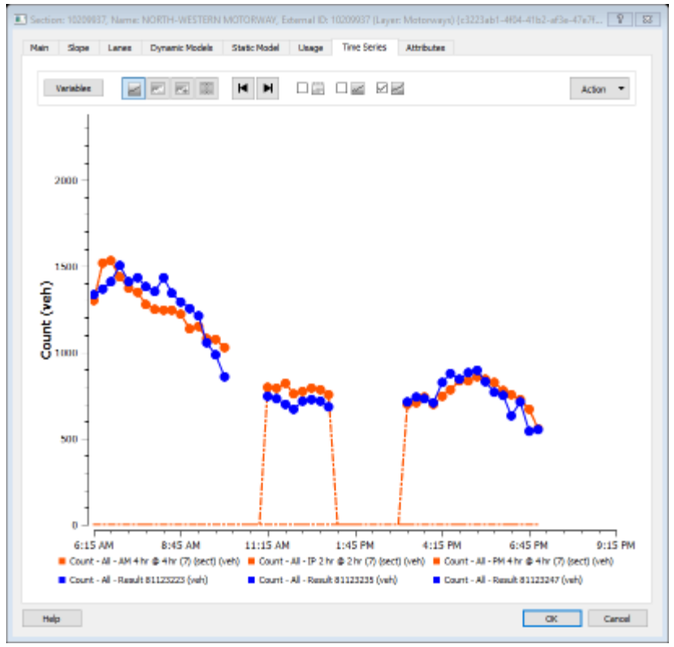


Northbound

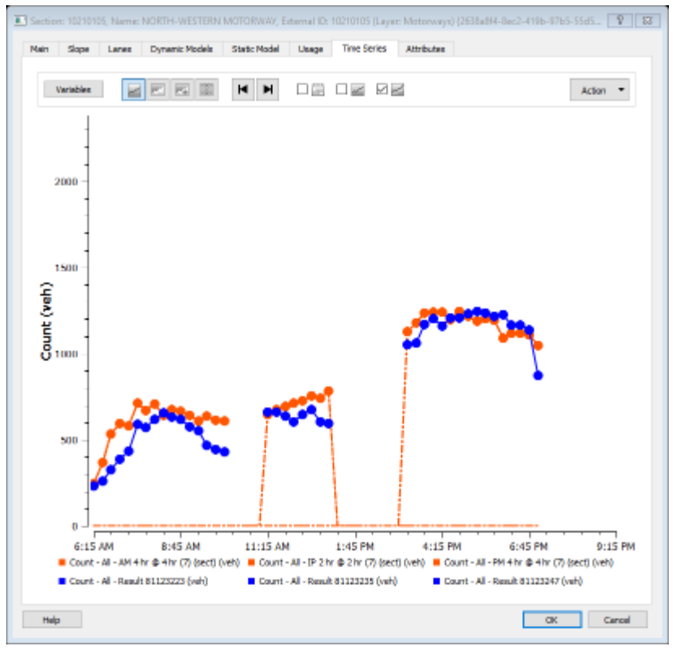


4 – SH16 East of Te Atatu Peninsula

Eastbound

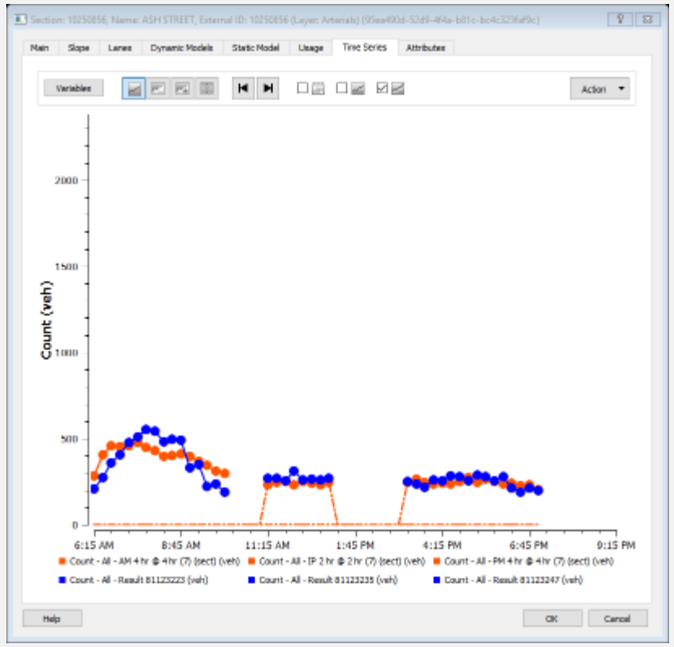


Westbound

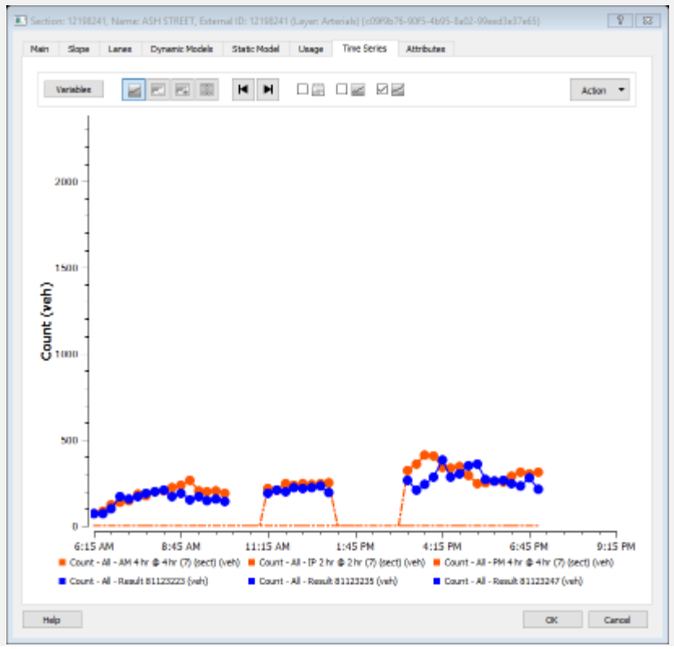


5 – Ash Street, New Lynn

Eastbound

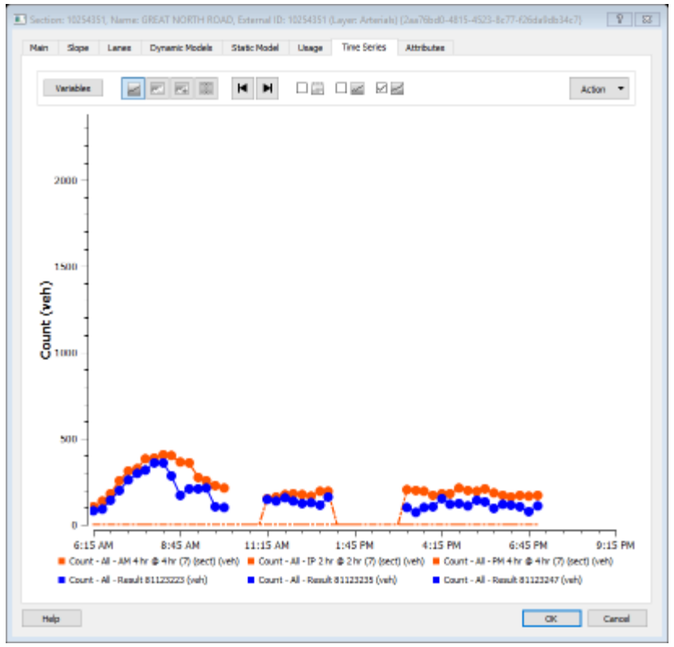


Westbound

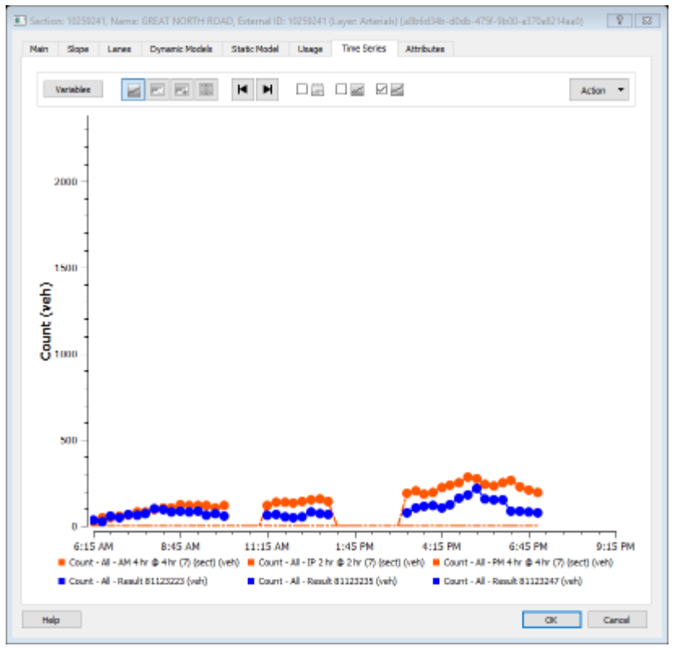


6 – Great North Road between Pt Chevalier Road and St Lukes Road

Eastbound

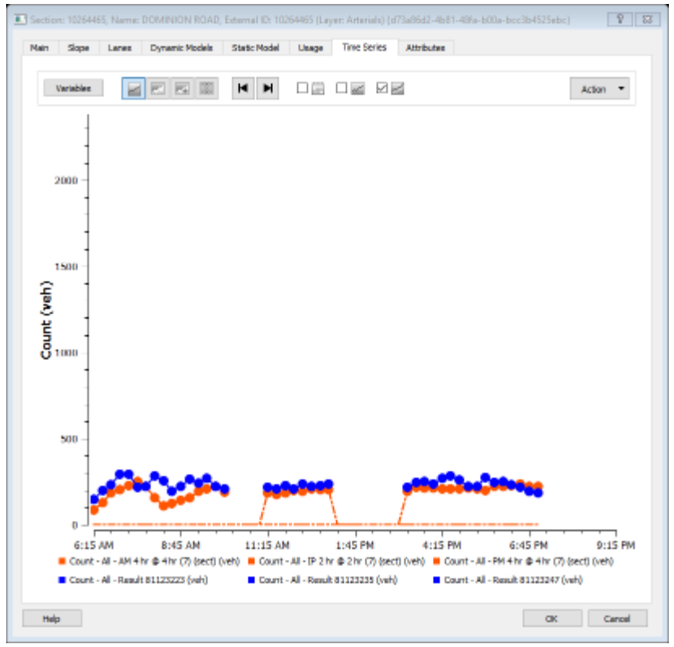


Westbound



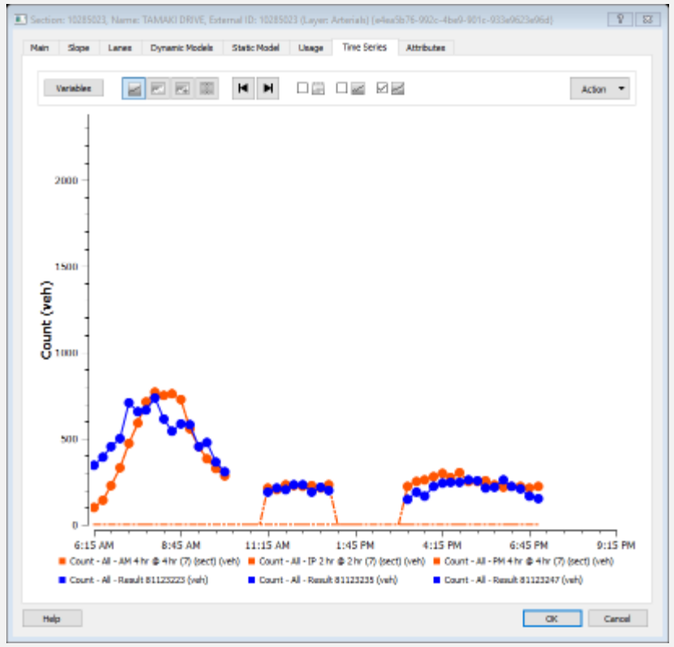
7 – Dominion Road north of Balmoral Road

Northbound



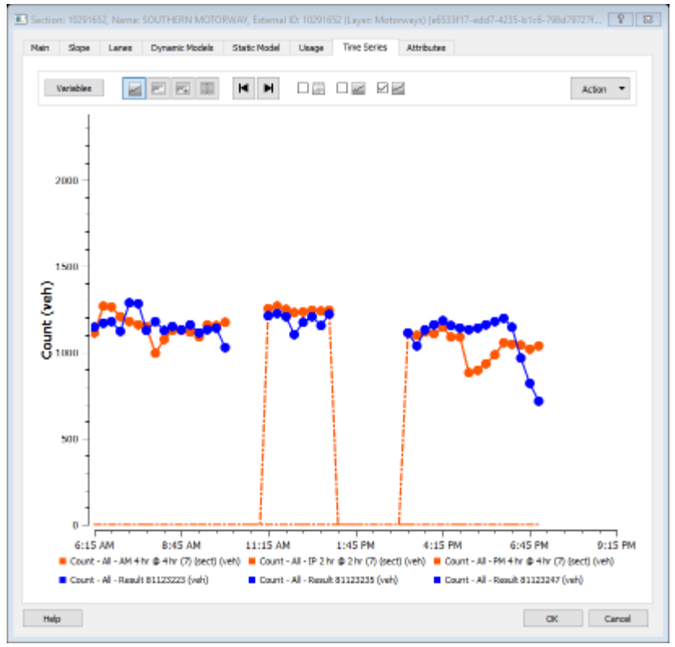
8 – Tamaki Drive west of Ngapipi Road

Westbound

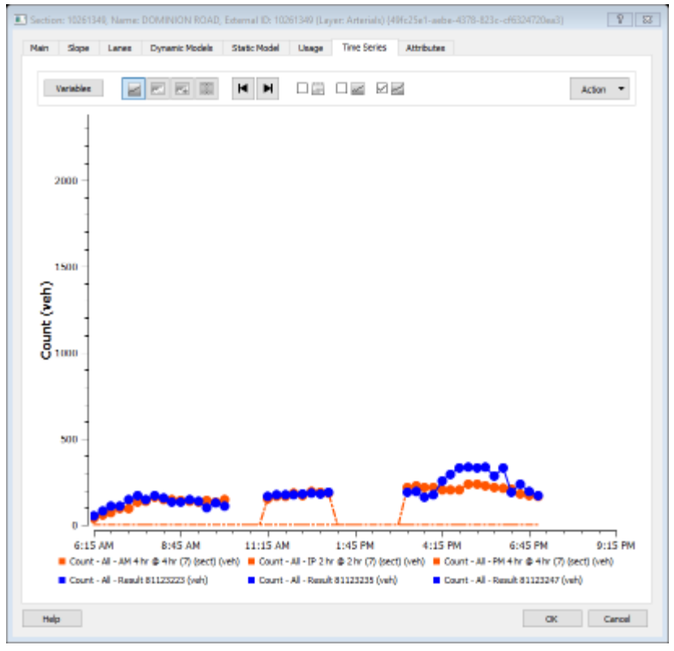


9 – Southern SH1 at Greenlane Interchange

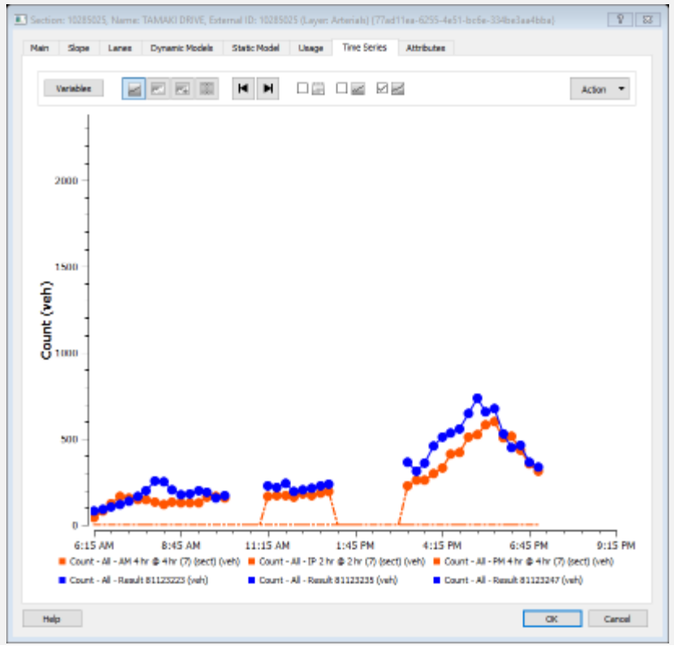
Northbound



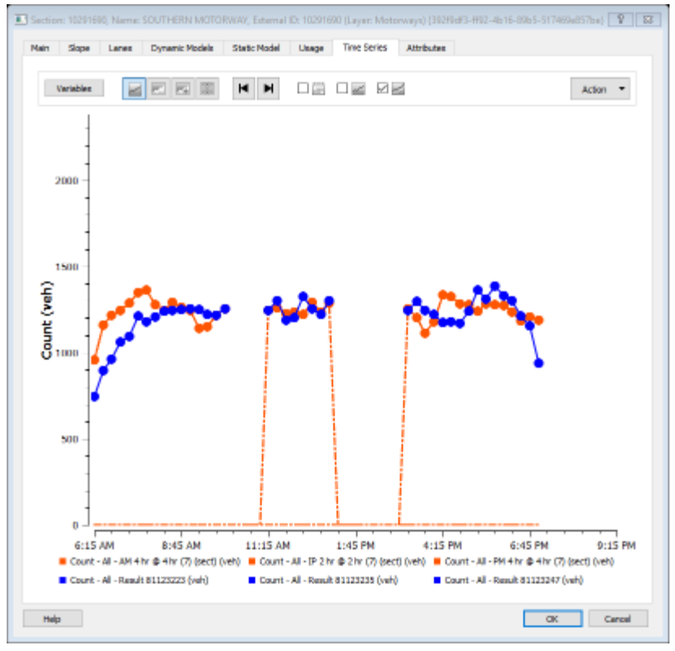
Southbound



Eastbound

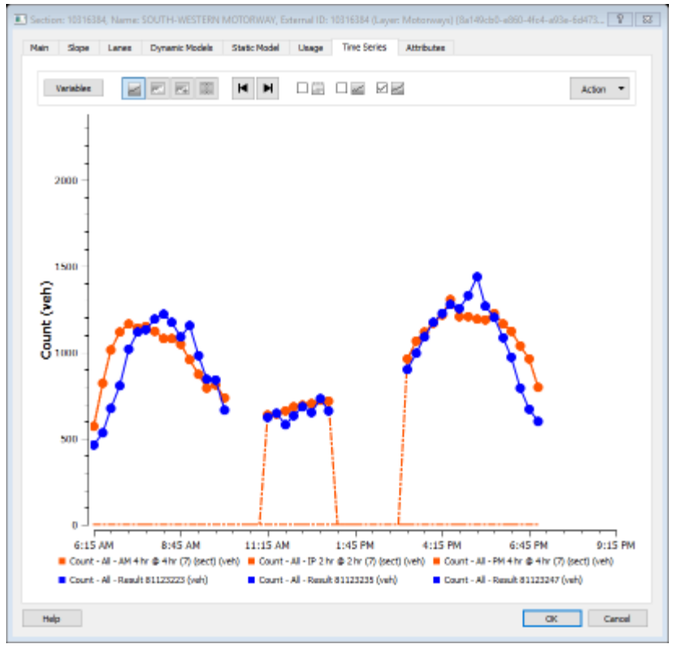


Southbound

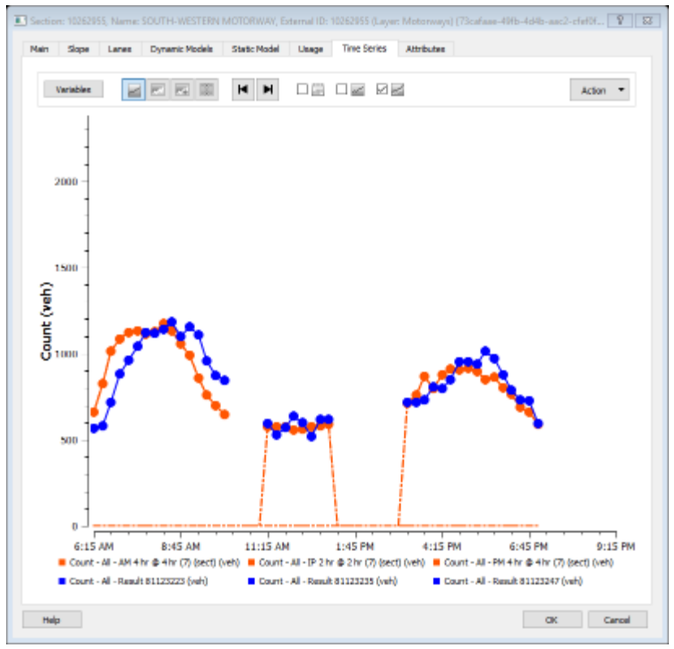


10 – SH20 Manukau Harbour Bridge

Northbound

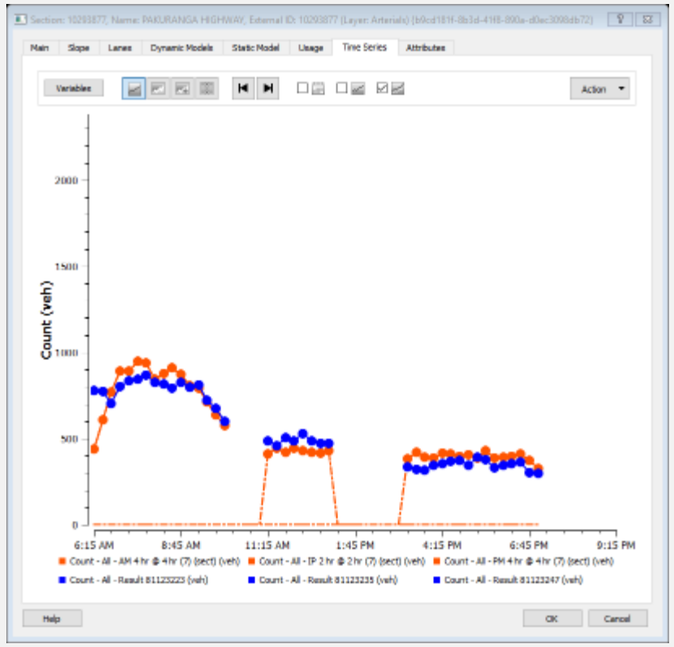


Southbound

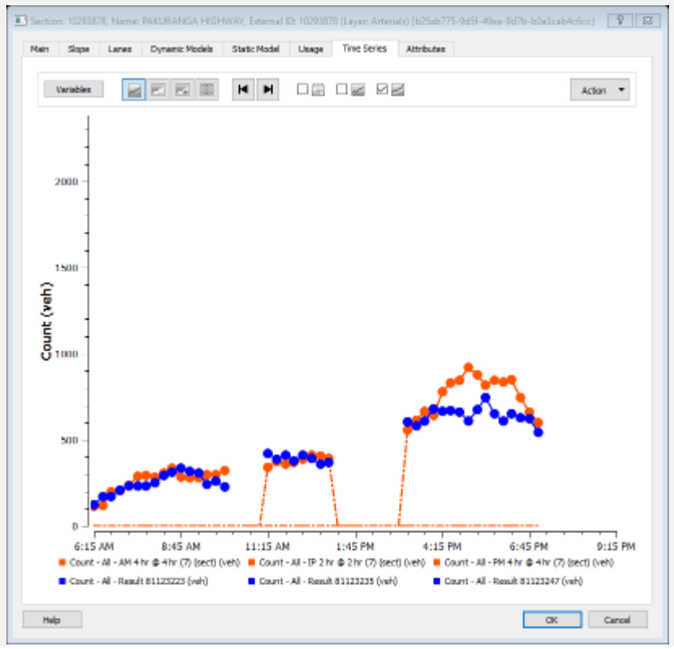


11 – Pakuranga Highway

Westbound

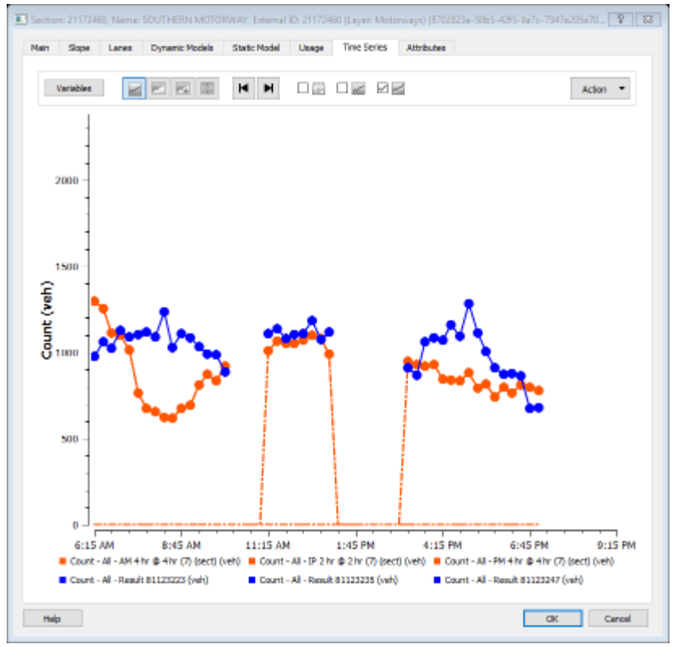


Eastbound

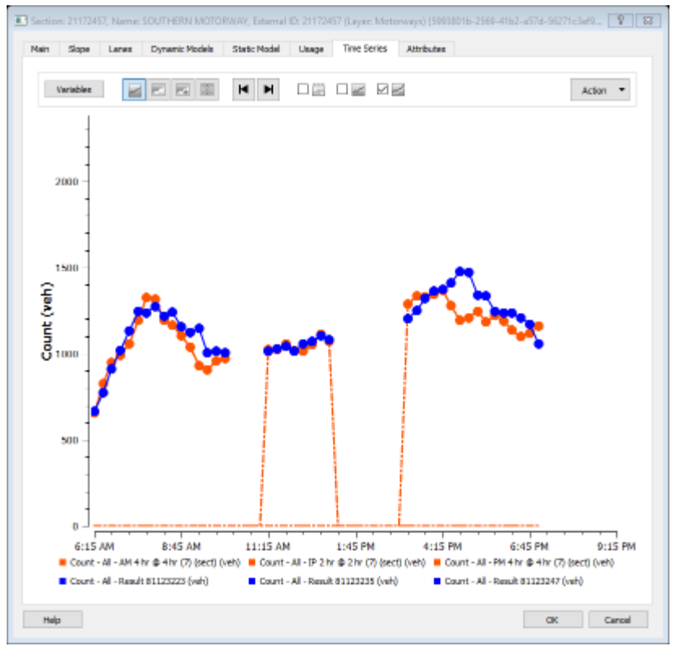


12 – Southern SH1 between Mt Wellington and Princes Street Interchange

Northbound

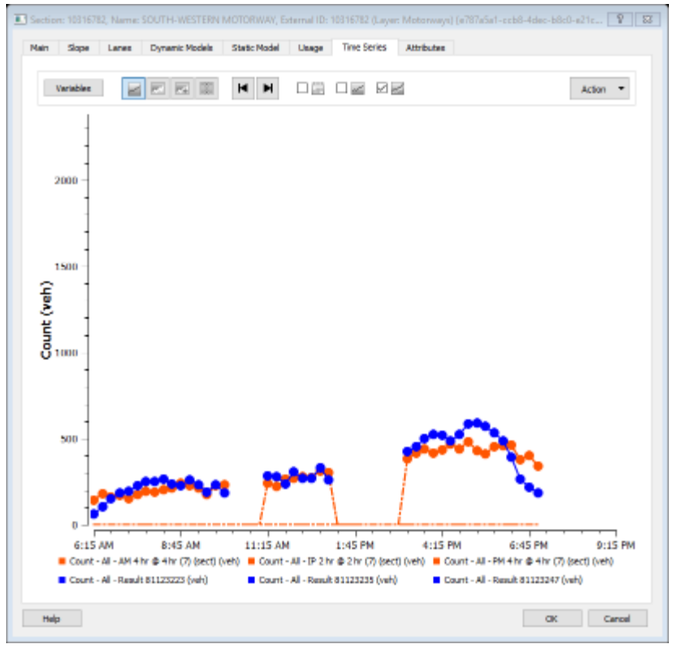


Southbound



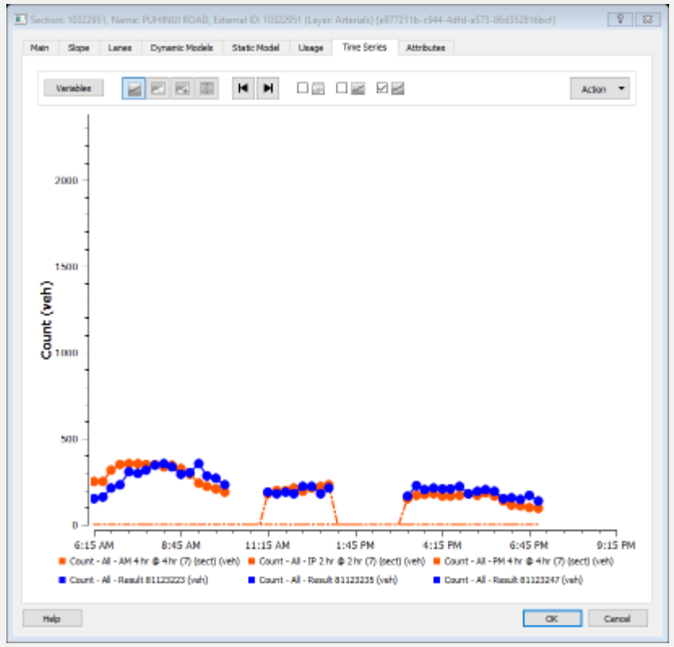
13 – SH20A near SH20

Northbound

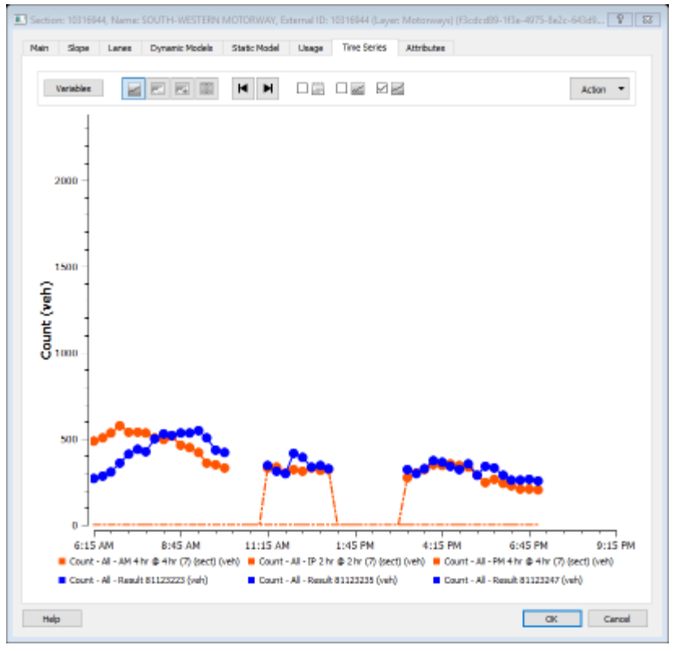


14 – SH20B near SH20

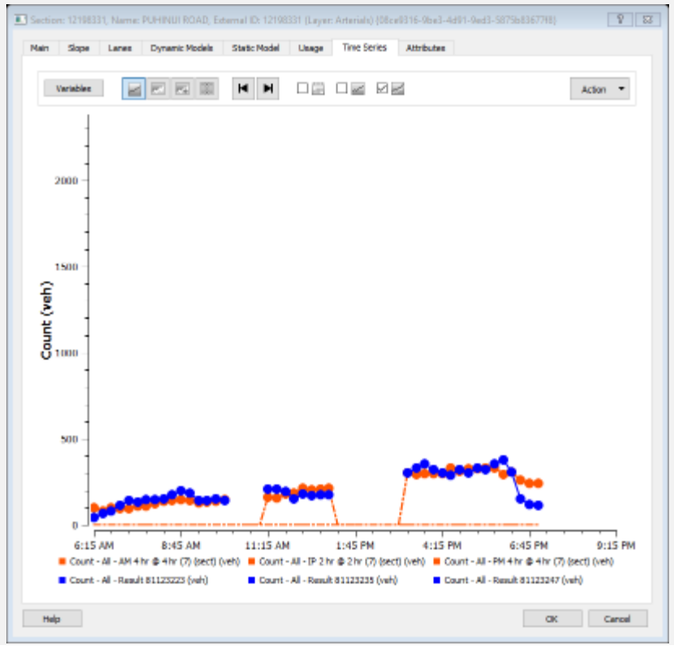
Westbound



Southbound



Eastbound



It is considered that ADTA replicates the observed flow profiles well with the exception of a few locations.

The exceptions are at 1 – Northern SH1 at Constellation Drive Interchange southbound in the AM peak, 3 – SH1 Harbour Bridge northbound in the PM peak, and 12 – Southern SH1 between Mt Wellington and Princes Street Interchange northbound in both the AM and PM peak periods.

All of these locations are upstream of significant known bottlenecks on the motorway (on SH1 at Esmonde in the North Shore; the Central Motorway Junction (CMJ) just south of the CBD; and on SH1 at Greenlane). In reality, these bottlenecks lead to considerable queue back and breakdown in flow through upstream motorway interchanges and extremely low upstream throughput. These bottlenecks are not accurately represented in ADTA and therefore the resulting upstream throughput is higher than observed.

The underlying issue is the inability of the Aimsun meso model to replicate the performance of motorways without significant localised adjustments, as detailed in **Chapter 0**. The calibration process used for ADTA, detailed in that chapter, provides a technically sound modelling approach that can be used consistently around the region, for base model development and in forecasting. However, application of this method and lack of localised adjustment means that some of the worst bottlenecks are not fully represented.

8.5 Travel Time Validation

The table below provides a summary of the travel time validation results for 94 routes across the region, shown in **Figure 5** in **Chapter 3.2.3**. These include 12 motorway routes and 82 arterial routes.

Summary of Travel Time Validation Results (Route-based)

	AM		IP		PM		NZTA GUIDELINE
	7- 8	8 - 9	11 - 12	12 - 1	4 - 5	5 - 6	Category A
BETWEEN 15TH / 85TH PERCENTILES	88%	86%	89%	87%	93%	82%	**N/A**
WITHIN 15% OR 1 MIN	47%	35%	65%	53%	46%	33%	**80%**

Full travel time route validation results are provided in **Appendix I**. Additionally, time-distance graphs for some important routes are provided in **Appendix J.**

The ADTA travel time validation results do not meet the criteria in any of the three peak periods. Analysis showed that routes were validating poorly with one or two segments having particularly poor validation. Validation results for the 517 individual segments of the routes are provided below and show a considerably higher proportion meeting the criteria. It is also worth noting that the individual segments are relatively long routes themselves, with an average length of 1.2km, and as such, travel time validation of these route segments is reasonable.

It's also worth noting that the individual segments are relatively long routes themselves, with an average length of 1.2km.

Summary of Travel Time Validation Results (Individual segments)

	AM		IP		PM		NZTA GUIDELINE
	7- 8	8 - 9	11 - 12	12 - 1	4 - 5	5 - 6	Category A
BETWEEN 15TH / 85TH PERCENTILES	64%	63%	69%	64%	66%	59%	**N/A**
WITHIN 15% OR 1 MIN	79%	72%	93%	90%	78%	70%	**80%**[14]

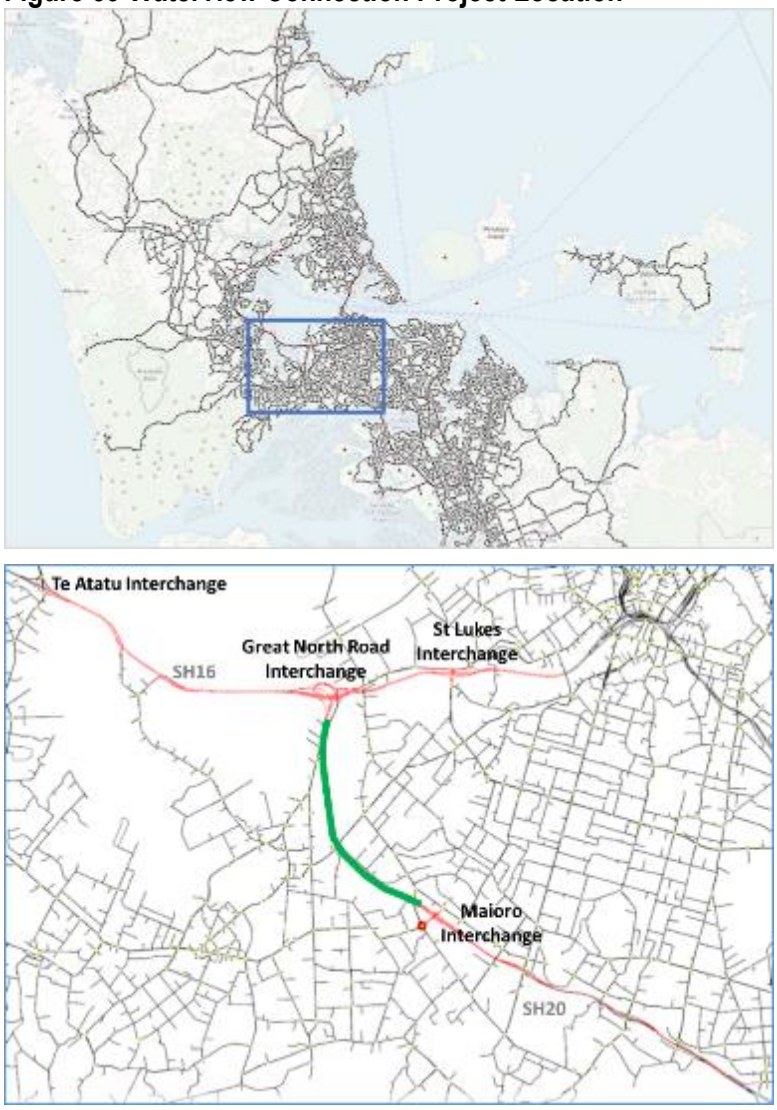
Some of the most notable deficiencies in travel time validation were identified on motorways. This is consistent with earlier discussions in **Chapter 8.4** on flow profile validation for motorways and general discussions on the mesoscopic modelling of motorways in **Chapter 7.2.**

[14] The NZTA Guideline does not have any criteria for travel times on individual segments. Criteria for route–based travel time were used for segments in this table

8.6 Model Response Test: Waterview Connection

Waterview Connection is a new motorway connection between SH20 in the south and SH16 in the west. Of its total length of 4.5km, 2.4km are in the form of new twin tunnels, which carry 3 lanes of traffic in each direction. The project was completed and opened in June 2017. **Figure 39** shows location of the project and associated improvement works on SH16 and SH20.

Figure 39 Waterview Connection Project Location



This significant infrastructure change happened after March 2016, the ADTA model's base reference date, and it provided the basis for an obvious network scenario to test the model's response.

A new scenario was created from the ADTA base model with the following network changes:

- New Waterview Tunnel between Maioro and Great North Road (GNR) Interchanges
- Widening and interchange improvements along SH16 between Te Atatu and St Lukes Interchanges
- Widening and interchange improvements along SH20 between Maioro and Queenstown Road Interchanges
- Intersection changes at Great North Road, Maioro and St Lukes Interchanges

- Intersection changes at Maioro Road / Richardson Road signalised intersection (local roads)
- Attribute Overrides for related construction works were removed

This scenario was run with the base model demands (2016) and the modelled flows were compared to the obsesrved counts collected in October 2017.

Figure 40 through to **Figure 43** present the flow comparison between the model and the observed data over each model period (i.e. 4-hour for AM and PM peak periods and 2-hour for inter-peak).

Figure 40 Observed vs Modelled Flows on Waterview Tunnel and new motorway-motorway ramps

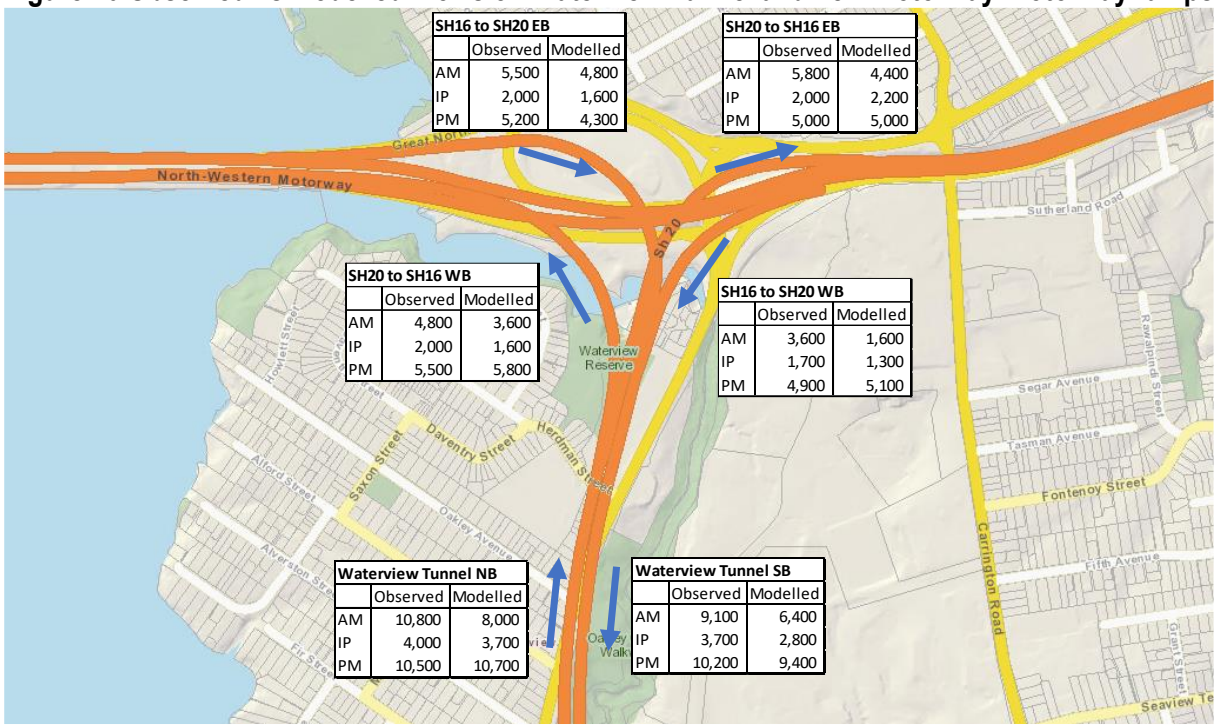


Figure 41 Observed vs Modelled Flow Differences at SH16 Great North Road Interchange (Increase in orange, reduction in blue)

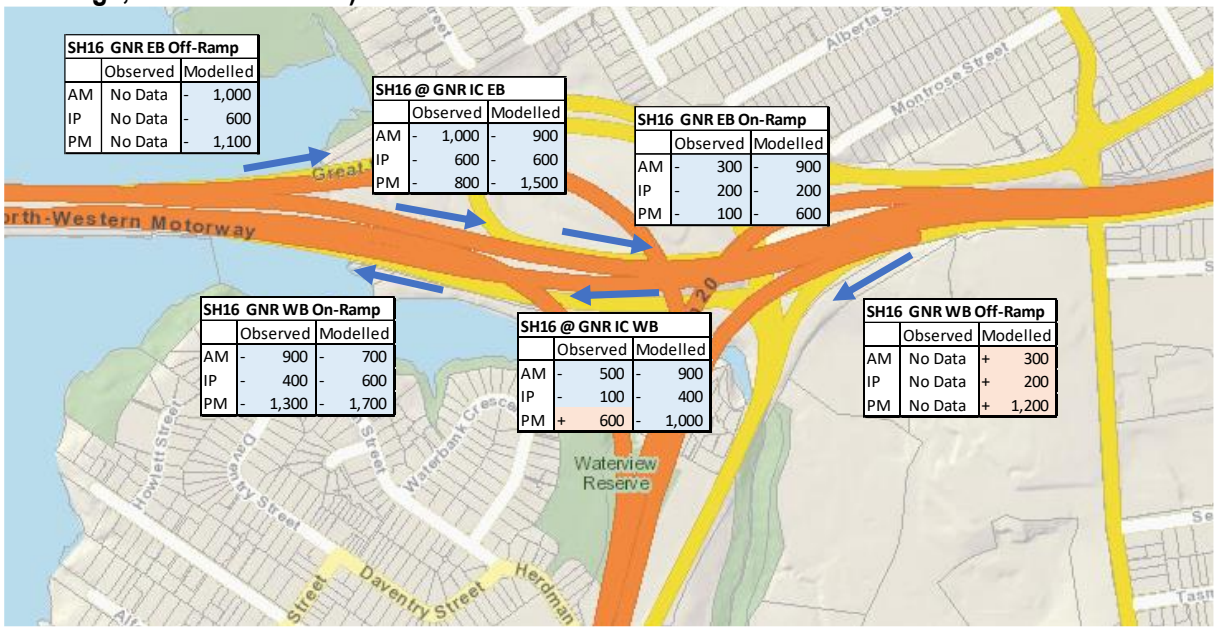


Figure 42 Observed vs Modelled Flow Differences at Wider SH Locations (Increase in orange, reduction in blue)

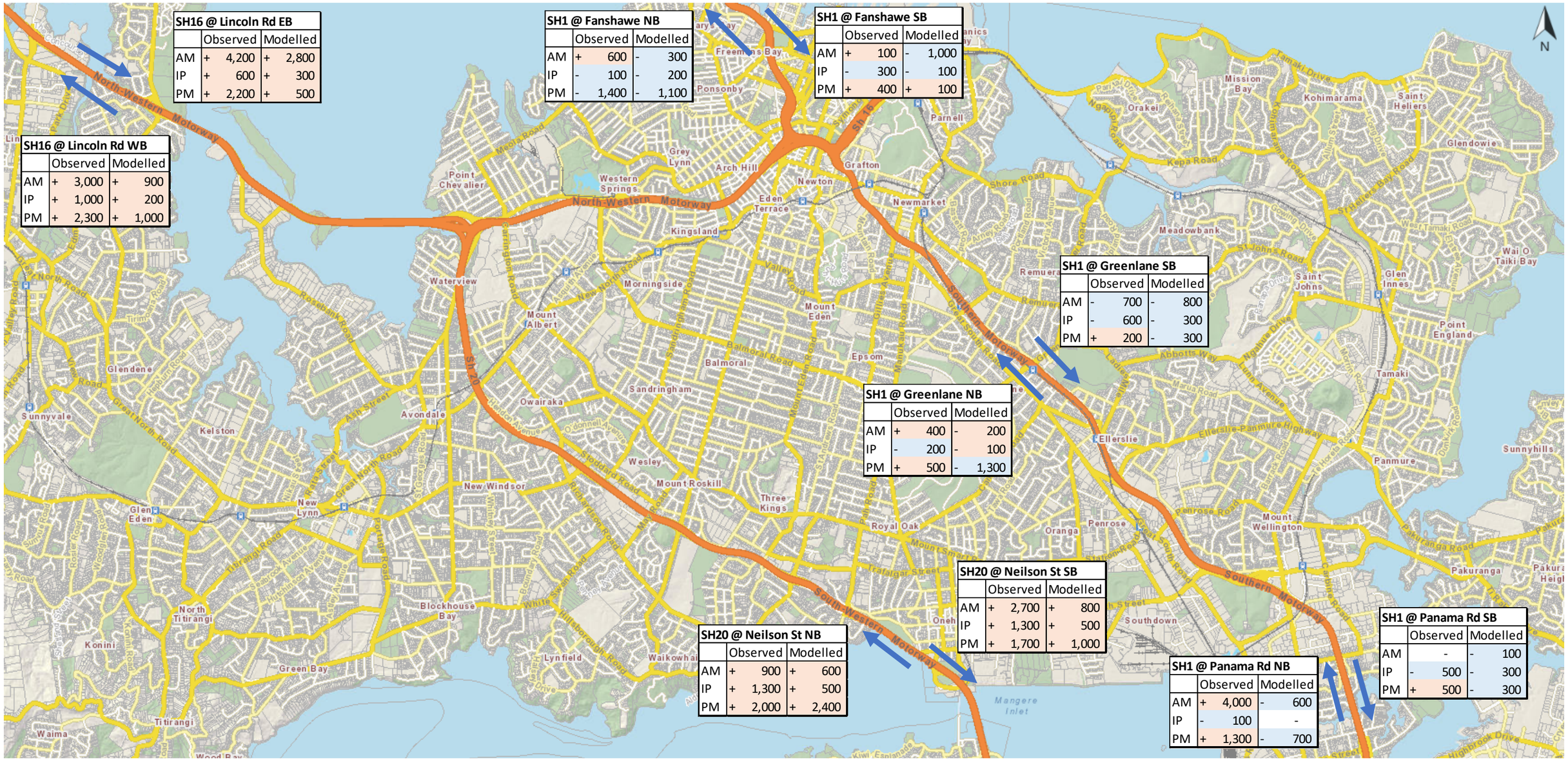
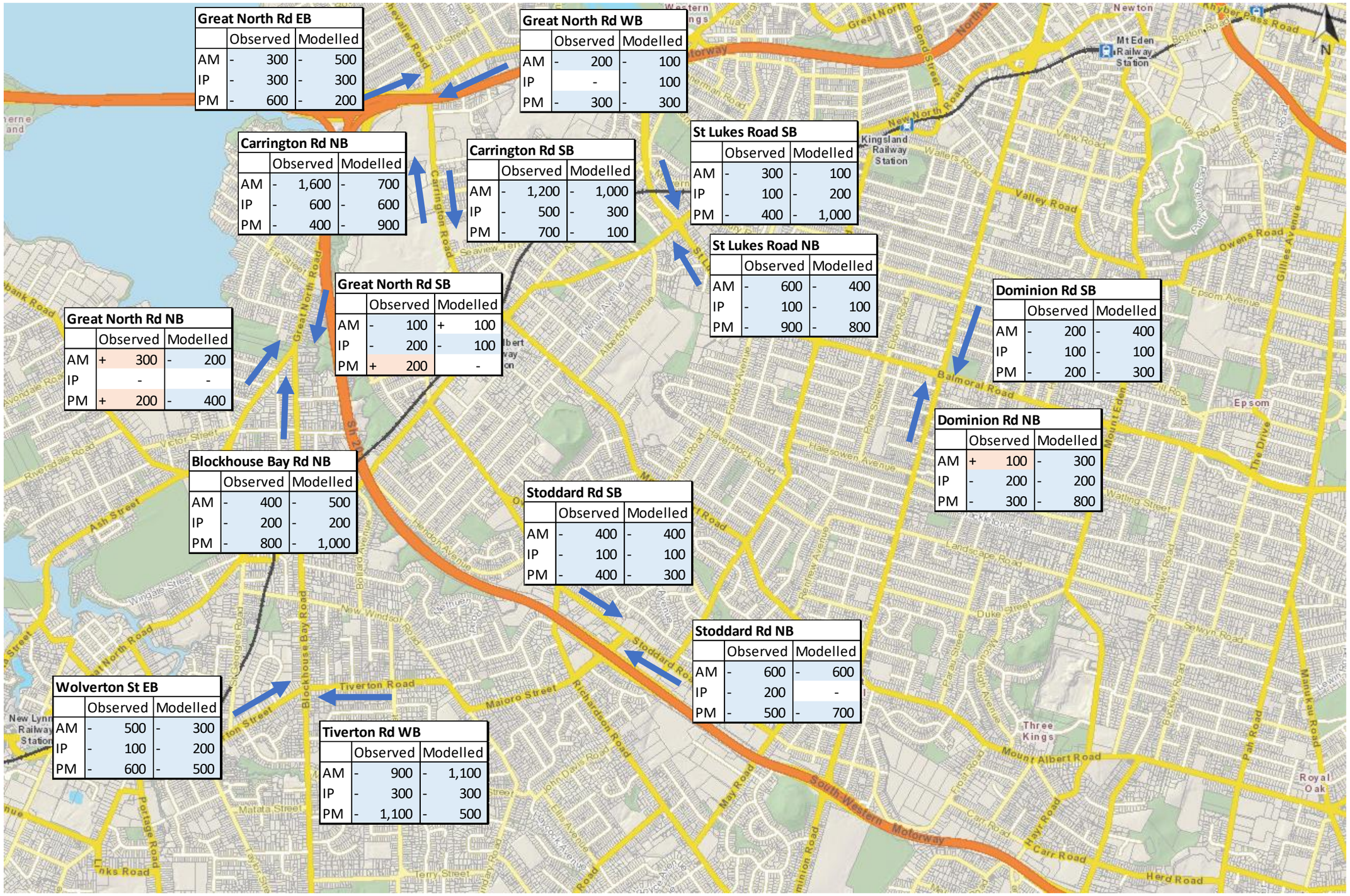


Figure 43 Observed vs Modelled Flow Differences on Local Roads (Increase in orange, reduction in blue)



The following inferences can be made on the Waterview Connection test from the above figures:

- In general, the modelled flows on the new links and the changes across the networks are reasonable.
- The modelled flows on the tunnels are lower in the AM peak period, however, changes at individual locations are in the right directions overall.
- Exceptions are on SH1 at Greenlane and Panama Road interchanges in the northbound direction. This is related to the shortfall in the base model where it lacks the existing bottleneck at Greenlane Interchange and the subsequent queues at upstream interchanges. In reality, opening of the Waterview Connection significantly reduced this bottleneck, if not removed it completely, and improved the throughputs at Greenlane Interchange and the upstream interchanges.

9 Model Functionality

9.1 Functionality Checklist

Below table lists model objectives proposed in the original project scoping document[15] and how the ADTA model could be applied to achieve each objective. At the time of writing this report, a set of detailed model handling protocols are being developed to control and monitor its application in a systematic and consistent way.

MODEL OBJECTIVE	ADTA APPLICATIONS
1. INVESTIGATE NETWORK-WIDE, TIME-VARYING ROAD PRICING SCHEMES	YES – using the ADTA with modification to vehicle classes These schemes can be tested in the ADTA model using appropriate VOT segmentation and demand inputs from the MSM. The input desired arrival profile in the ADTA profiling model can also be adjusted to reflect peak spreading effects.
2. REDUCE REQUIREMENT FOR EXPENSIVE ONE-OFF PROJECT MODEL DEVELOPMENT AND PEER REVIEW	YES – using the ADTA as the platform For individual projects, subarea models (meso or micro-simulation, or hybrid, depending on the project requirements) can be generated from the ADTA model. These will consist of detailed base model network pre-loaded with all signal control plans, bus routes and stops, and initial demands, significantly reducing network development effort. Modellers can focus on calibration (note local calibration is still required) and application of the model. Because the ADTA model will have its own model handling protocols for subarea models, in addition to the existing network coding guidelines, project models will be more consistent and accurate in terms of network coding and processes. This will reduce the need for peer review of individual project models. Overall, model development cost is expected to reduce by 30% for each project base model.
3. EVALUATE INCIDENT MANAGEMENT PLANS	YES These plans can be tested in the ADTA model (for region-wide plans), or using subarea models generated from the ADTA model (for local plans).
4. PROVIDE AN INTEGRATED NETWORK MODELLING SYSTEM IN A FORM OF SINGLE REGIONAL TRAFFIC MODEL FOR REGIONAL CONSISTENCY	YES The ADTA model has been developed and will be maintained at regional level to serve this very purpose.
5. REDUCE RELIANCE ON MSM VEHICLE ASSIGNMENT	YES The ADTA will be used to produce traffic forecasts in place of the MSM in absence of any local area model.
6. SUPPORT REGIONAL AND LOCAL ROAD PLANNING ASSESSMENT	YES These can be assessed in the ADTA model (for region-wide plans), or using subarea models generated from the ADTA model (for local plans).
7. DETAILED INVESTIGATION AND EVALUATION OF MAJOR ROADING PROJECTS	YES – using the ADTA as the platform Detailed operational assessment can be undertaken using smaller micro-simulation subarea models generated from the ADTA.
8. TOLL, ROAD PRICING AND CONGESTION CHARGING INVESTIGATIONS	YES – using the ADTA with modification to vehicle classes Refer to item 1 above
9. DEVELOPMENT PLANNING AND ASSESSMENT	YES – using the ADTA as the platform Development impacts can be assessed using subarea models generated from the ADTA model. These can be of varying scale and level of details depending on the size and nature of the development. For very small developments, the ADTA can be used to provide input flows for SIDRA analyses.
10. PRIORITY LANE INVESTIGATION AND EVALUATION (HOV AND BUS)	YES

[15] Auckland Dynamic Traffic Assignment Model Project Scoping Document (Jul 2014)

	These schemes can be tested in the ADTA model (for region-wide schemes), or using subarea models generated from the ADTA model (for local schemes).
11. SIGNAL NETWORK AND CORRIDOR OPTIMISATION PROGRAMME	YES – using the ADTA as the platform Signal optimisation programmes typically require micro-simulations to represent detailed signal operation and capture the key PFIs (usually in the form of intersection queue lengths and delays). These can be developed from the subarea models generated from the ADTA.
12. INPUT INTO ROAD NETWORK DEFICIENCY ANALYSIS	YES These inputs are currently produced by the MSM. The ADTA will replace the MSM, similarly to item 5.
13. OPTION TESTING AND EVALUATION FOR CORRIDOR MANAGEMENT PLANS AND CENTRE-BASED TRANSPORT STUDIES	YES – using the ADTA as the platform Subarea models of varying scale and level of details can be generated depending on the project requirements.
14. TRAVEL INFORMATION SYSTEM / VARIABLE MESSAGE SIGN INVESTIGATIONS	YES These schemes can be tested in the ADTA model (for region-wide schemes), or using subarea models generated from the ADTA model (for local schemes).
15. CONSTRUCTION TRAFFIC MANAGEMENT PLANNING	YES In absence of the local area model, lane closures due to construction traffic management can be tested usign the ADTA model.

9.2 Future Developments

The newly developed ADTA base model is considered as a “working model” and the intention is to continuously improve and update this model.

This chapter discusses currently identified development areas.

9.2.1 Vehicle Classification

As mentioned earlier in **Chapter 0**, the original intention was to have separate T2 and T3+ Car classes to match the Auckland transport’s transit lane definition but these were combined in attempt to resolve the DUE convergence issues encountered during the model development.

In March 2016, Onewa Road was the only corridor with T3+ lanes. However, a number of T3+ transit lanes have been installed across the region since, and it is expected to rise in future.

With the DUE convergence issues resolved in the final base model, the splitting of the existing Car – HOV class into T2 and T3+ may be a viable option and warrants further testing.

9.2.2 Toll Component in Cost Functions

Another consideration for future scenarios is toll cost component in cost functions, which is currently absent from the base model. The existing road network has no toll road with the exception of Johnstone Tunnels, 45km away from the CBD, where the route choice was locally calibrated in the base model.

It is possible that a form of road pricing will be introduced in Auckland in the near future and schemes will need to be investigated. Static generalised cost and DCFs will need to be revised to include toll cost component before these scenarios can be tested in the ADTA model.

9.2.3 Micro-simulation Areas

Current software and hardware constraints prevent micro-simulation areas from being added to the ADTA model, converting it to a regional meso-micro hybrid model, without resulting in exorbitantly high model run-times. When these constraints are removed, there will be a desire to activate micro-simulation areas in the CBD and major town centres.

10 Conclusions

The newly developed ADTA model incorporates best modelling practice where possible, while adopting the model development philosophy of systematicity and consistency. Consideration was given to model's ability to forecast at each stage of the model development minimising reliance on localised calibration adjustments.

The resulting mesoscopic model is considered technically sound and robust.

While it does not meet the model validation criteria perfectly, the base model produces reasonable model responses to network changes as confirmed by the Waterview Connection test.

More importantly, the ADTA model is considered to meet its design purposes in that it provides an evaluation tool for region-wide schemes of time-varying nature, and it provides a common and consistent starting point for project models, meeting the originally specified model objectives. Its applications will be closely controlled and monitored with well-defined protocols.

Appendix A

Attribute Overrides

NAME	STATIC	MESO
0_ALL_ALL_MAXSPEED_CMJ&HARBOURBRIDGE_80KM/H	√	√
0_ALL_ALL_MAXSPEED_LOCALCAL_VARIES	√	√
0_ALL_ALL_MAXSPEED_ROUNDABOUTCIRCULATIONSECTIONS_VARIES	√	√
0_ALL_ALL_UDC1_MOTORWAYPASTRAMPS_0.01	√	√
0_ALL_DYNAMIC_RESERVEDLANELOOKAHEADDIST_LOCALCAL_VARIES		√
0_ALL_MESO_GWTIMEFACTOR_LOCALCAL_3		√
0_ALL_MESO_LOOKAHEADDISTANCE_LOCALCAL_VARIES		√
0_ALL_MESO_LOOKAHEADDISTANCE_MOTORWAY_LOCALCAL_500		√
0_ALL_MESO_LOOKAHEADDISTANCE_MOTORWAY_MAINLINELANEDROP_1000		√
0_ALL_MESO_LOOKAHEADDISTANCE_MOTORWAY_OFF-RAMP_1000		√
0_ALL_MESO_LOOKAHEADDISTANCE_MOTORWAY_OFF-RAMP_250		√
0_ALL_MESO_LOOKAHEADDISTANCE_MOTORWAY_OFF-RAMP_500		√
0_ALL_MESO_LOOKAHEADDISTANCE_MOTORWAY_OFF-RAMP_750		√
0_ALL_MESO_PENALISESHARELANE_LOCALCAL_FALSE		√
0_ALL_MESO_RXNTIMEFACTOR_3TO2LANEMAINLINEMERGE_1.5		√
0_ALL_MESO_RXNTIMEFACTOR_4TO3LANEMAINLINEMERGE_1.3		√
0_ALL_MESO_RXNTIMEFACTOR_5TO4LANEMAINLINEMERGE_1.1		√
0_ALL_MESO_RXNTIMEFACTOR_LOCALCAL_VARIES		√
0_ALL_MESO_RXNTIMEFACTOR_SINGLELANERAMP_1.15		√
0_ALL_MESO_RXNTIMEFACTOR_UPSTREAMOFOFFRAMP_0.5		√
0_ALL_MESO_SH16_OFFRAMP_RXNTIMEFACTOR_0.5		√
0_ALL_MESO_SH16_ONRAMP_RXNTIMEFACTOR_0.5		√
0_ALL_MESO_SH18_OFFRAMP_RXNTIMEFACTOR_0.5		√
0_ALL_MESO_SH18_ONRAMP_RXNTIMEFACTOR_0.5		√
0_ALL_MESO_SH1N_OFFRAMP_RXNTIMEFACTOR_0.5		√
0_ALL_MESO_SH1N_ONRAMP_RXNTIMEFACTOR_0.5		√
0_ALL_MESO_SH1S_OFFRAMP_RXNTIMEFACTOR_0.5		√
0_ALL_MESO_SH1S_ONRAMP_RXNTIMEFACTOR_0.5		√
0_ALL_MESO_SH20_OFFRAMP_RXNTIMEFACTOR_0.5		√
0_ALL_MESO_SH20_ONRAMP_RXNTIMEFACTOR_0.5		√

NAME	STATIC	MESO
0_ALL_STATIC_CAPACITY&UDC2_ONELANE_BRIDGE_500	√	
0_ALL_STATIC_CAPACITY_RAILCROSSING_1200	√	
0_AM_MESO_RXNTIMEFACTOR_ROYALHOBSONVILLEMERGE_3.2		√
0_AM_STATIC_CAPACITY&UC2_HARBOURBRIDGE&PANMUREBRIDGE_VARIES	√	
0_IP_STATIC_CAPACITY&UC2_HARBOURBRIDGE&PANMUREBRIDGE_VARIES	√	
0_PM_MESO_RXNTIMEFACTOR_3TO2LANEMAINLINEMERGE_ONEWA_0.8		√
0_PM_STATIC_CAPACITY&UC2_HARBOURBRIDGE&PANMUREBRIDGE_VARIES	√	
1_ALL_ALL_MAXSPEED_SPEEDLIMIT_DOMAIN_30	√	√
1_ALL_ALL_MAXSPEED_SPEEDLIMIT_PONSONBYRD_40	√	√
1_ALL_ALL_MAXSPEED_SPEEDLIMIT_QUEEN_30	√	√
1_ALL_ALL_MAXSPEED_SPEEDLIMIT_WESTHAVEN_30	√	√
1_ALL_ALL_MAXSPEED_TOWNCENTRESPEEDENVIRON_PARNELL_30	√	√
10_ALL_ALL_MAXSPEED_LOCALCAL_GSR_30	√	√
10_ALL_ALL_MAXSPEED_LOCALCAL_OPAHEKERD_60	√	√
10_ALL_ALL_MAXSPEED_PAPAKURA2ORAMCONSTRUCTION_80	√	√
10_ALL_ALL_MAXSPEED_SPEEDLIMIT_60	√	√
10_ALL_ALL_MAXSPEED_SPEEDLIMIT_70	√	√
2_ALL_ALL_MAXSPEED_SPEEDLIMIT_30OR80	√	√
2_ALL_ALL_MAXSPEED_TOWNCENTRESPEEDENVIRON_GLENINNES_30	√	√
2_ALL_ALL_MAXSPEED_TOWNCENTRESPEEDENVIRON_NEWMARKET_40	√	√
2_ALL_MESO_LOOKAHEADDISTANCE_LOCALCAL_GREENLANEELLERSLIEROUNDABOUT_500		√
2_ALL_MESO_RXNTIMEFACTOR&GIVEWAYPARAMETERS_LOCALCAL_PANMUREROUNDABOUT_VARIES		√
3_ALL_ALL_MAXSPEED_SPEEDLIMIT_60	√	√
3_ALL_ALL_MAXSPEED_SPEEDLIMIT_WATERVIEW_80KM/H	√	√
3_ALL_ALL_MAXSPEED_TOWNCENTRESPEEDENVIRON_AVONDALE_30	√	√
3_ALL_ALL_MAXSPEED_TOWNCENTRESPEEDENVIRON_KINGSLAND_40	√	√
3_ALL_ALL_MAXSPEED_TOWNCENTRESPEEDENVIRON_MTALBERT_40	√	√
3_ALL_ALL_MAXSPEED_TOWNCENTRESPEEDENVIRON_MTEDEN_30	√	√
3_ALL_ALL_MAXSPEED_TOWNCENTRESPEEDENVIRON_PTCHEV_30	√	√
3_ALL_ALL_MAXSPEED_TOWNCENTRESPEEDENVIRON_ROYALOAK_30	√	√
3_ALL_ALL_MAXSPEED_WATERVIEWCONSTRUCTION_80	√	√
3_ALL_MESO_LOOKAHEADDISTANCE_LOCALCAL_GSR@GREENLANE_400		√
3_ALL_MESO_RXNTIMEFACTOR_LOCALCAL_QUEENSTOWNRD_1.5		√

NAME	STATIC	MESO
4_ALL_ALL_MAXSPEED_LOCALCAL_CLEVEDONTAKANINIRD_100	√	√
4_ALL_ALL_MAXSPEED_LOCALCAL_KIRKBRIDE_80	√	√
4_ALL_ALL_MAXSPEED_LOCALCAL_ROSCOMMONRD_80	√	√
4_ALL_ALL_MAXSPEED_LOCALCAL_TRENWITHST_35	√	√
4_ALL_ALL_MAXSPEED_SPEEDLIMIT_100	√	√
4_ALL_ALL_MAXSPEED_SPEEDLIMIT_30	√	√
4_ALL_ALL_MAXSPEED_SPEEDLIMIT_60	√	√
4_ALL_ALL_MAXSPEED_SPEEDLIMIT_70	√	√
4_ALL_ALL_MAXSPEED_SPEEDLIMIT_80	√	√
4_ALL_ALL_MAXSPEED_TRAFFICCALMING_20	√	√
4_ALL_MESO_RXNTIMEFACTOR_LOCALCAL_PUHUNUIINTERCHANGE_0.8		√
5_ALL_ALL_MAXSPEED_LOCALCAL_KILLENYDR_40	√	√
5_ALL_ALL_MAXSPEED_SPEEDLIMIT_30	√	√
5_ALL_ALL_MAXSPEED_SPEEDLIMIT_60	√	√
5_ALL_ALL_MAXSPEED_SPEEDLIMIT_70	√	√
5_ALL_ALL_MAXSPEED_SPEEDLIMIT_80	√	√
6_ALL_ALL_MAXSPEED_TOWNCENTRESPEEDENVIRON_BLOCKHOUSEBAY_30	√	√
6_ALL_ALL_MAXSPEED_TOWNCENTRESPEEDENVIRON_GLENEDEN_30	√	√
6_ALL_ALL_MAXSPEED_TOWNCENTRESPEEDENVIRON_HENDERSON_30	√	√
6_ALL_ALL_MAXSPEED_TOWNCENTRESPEEDENVIRON_NEWLYNN_30	√	√
7_ALL_ALL_MAXSPEED_LINCOLNCONSTRUCTION_80	√	√
7_ALL_ALL_MAXSPEED_TEATATUCONSTRUCTION_80	√	√
7_ALL_ALL_MAXSPEED_TEATATUROADWORKS_30	√	√
7_ALL_ALL_MAXSPEED_WESTGATE2LINCOLNCONSTRUCTION_80	√	√
7_ALL_MESO_LOOKAHEADDISTANCE_LOCALCAL_LINCOLNIC_VARIES		√
8_ALL_ALL_MAXSPEED_SPEEDLIMIT_80	√	√
8_ALL_ALL_MAXSPEED_SPEEDLIMIT_NORTHERNBUSWAY_80	√	√
8_ALL_ALL_UDC1_CALIBRATION_0.1	√	√
9_ALL_ALL_MAXSPEED&CAPACITY&UDC2_WHANGAPARAOA_VARIES	√	√
9_ALL_ALL_MAXSPEED_SPEEDLIMIT_ALBANYEXPRESSWAY_80	√	√
9_ALL_ALL_MAXSPEED_SPEEDLIMIT_ALBANYHEIGHT_70	√	√
9_ALL_ALL_MAXSPEED_SPEEDLIMIT_ALBANYUPPERHARBOUR_70	√	√
9_ALL_ALL_MAXSPEED_SPEEDLIMIT_ECR_80	√	√
9_ALL_ALL_MAXSPEED_SPEEDLIMIT_GRANDDRIVE_70	√	√

NAME	STATIC	MESO
9_ALL_ALL_MAXSPEED_SPEEDLIMIT_GREVILLE_80	√	√
9_ALL_ALL_MAXSPEED_SPEEDLIMIT_HBCHIGHWAY_70	√	√
9_ALL_ALL_MAXSPEED_SPEEDLIMIT_OREWATOWNCENTRE_30	√	√
9_ALL_ALL_MAXSPEED_SPEEDLIMIT_OTEHAVALLEY_60	√	√
9_ALL_ALL_MAXSPEED_SPEEDLIMIT_SH18_80	√	√
9_ALL_ALL_TOLL_NORTHERNGATEWAY_230 470	√	√

Appendix B

Sector-to-Sector 2-to-4-hour Expansion Factors

Sector 98 includes the northern external zones while Sector 99 includes the southern external zones.

Car AM

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	98	99
1	1.68	1.56	1.74	1.65	1.46	1.48	1.46	1.49	1.49	1.40	1.44	1.40	1.28	1.70	1.71	1.08	1.15	2.00	2.27	1.23
2	1.90	1.66	2.05	1.83	1.66	1.67	1.61	1.66	1.59	1.70	1.65	1.64	1.55	1.78	1.76	1.36	1.38	2.00	2.34	1.50
3	1.69	1.63	1.71	1.84	1.68	1.74	1.70	1.86	1.65	1.89	1.73	1.66	1.70	1.71	1.54	1.36	1.55	2.00	1.97	1.71
4	1.70	1.59	1.63	1.75	2.04	1.77	1.83	2.02	1.74	2.10	1.89	1.79	1.86	1.75	1.80	1.61	1.76	2.00	2.39	1.79
5	1.83	1.77	1.94	1.84	1.67	1.63	1.80	1.99	1.67	2.05	1.98	1.55	1.55	1.84	1.72	1.19	1.32	2.00	1.81	1.65
6	1.54	1.50	1.67	1.72	1.86	1.64	1.61	1.87	1.53	1.94	1.79	1.71	1.68	1.52	1.48	1.34	1.47	2.00	1.87	1.86
7	0.84	1.19	1.18	1.46	1.80	1.72	1.59	1.69	1.30	1.86	1.70	1.67	1.70	1.13	0.79	1.35	1.52	2.00	1.13	1.76
8	1.34	1.40	1.50	1.37	1.58	1.42	1.49	1.66	1.33	1.77	1.78	1.71	1.84	1.20	1.25	1.46	1.64	2.00	1.68	1.97
9	1.66	1.64	1.80	1.70	1.90	1.75	1.75	1.88	1.62	1.86	1.70	1.75	1.66	1.51	1.57	1.32	1.47	2.00	2.04	1.78
10	1.75	1.71	1.97	1.65	1.62	1.56	1.68	1.57	1.63	1.64	1.81	1.58	1.84	1.41	1.53	1.54	1.72	2.00	1.84	2.00
11	1.66	1.62	1.85	1.77	1.87	1.72	1.62	1.84	1.58	1.73	1.70	1.58	1.82	1.50	1.52	1.44	1.62	2.00	2.06	1.81
12	1.37	1.64	1.47	2.00	1.82	1.70	1.61	2.18	1.61	1.85	1.77	1.68	1.84	1.62	1.20	1.49	1.72	2.00	1.14	2.04
13	1.57	1.52	1.64	1.95	1.65	1.61	1.83	2.24	2.00	1.75	1.68	1.71	1.59	1.43	1.41	1.41	1.51	2.00	1.79	1.74
14	1.86	1.66	1.72	2.13	2.37	1.97	1.85	1.90	1.77	2.01	1.92	2.01	1.82	1.63	1.72	1.76	1.67	2.00	2.08	1.48
15	1.75	1.57	1.65	1.61	1.43	1.51	1.58	1.44	1.58	1.29	1.25	1.50	1.19	1.97	1.63	1.00	1.13	2.00	1.73	1.07
16	1.46	1.49	1.48	1.56	1.42	1.45	1.65	1.85	1.91	1.53	1.58	1.58	1.67	1.23	1.19	1.61	1.72	2.00	1.52	2.00
17	1.35	1.32	1.52	1.71	1.49	1.54	1.62	1.88	1.89	1.55	1.59	1.64	1.73	1.29	1.28	1.62	1.63	2.00	1.73	2.03
18	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	1.73	1.86
98	2.62	2.19	1.88	2.36	2.06	1.71	1.62	1.70	1.57	1.83	1.72	1.73	1.68	2.66	2.89	1.28	1.47	1.83	1.89	1.75
99	1.74	1.75	1.94	1.94	1.90	1.83	1.59	2.07	1.48	1.84	1.91	2.12	1.84	1.68	1.65	2.46	2.54	1.99	2.09	1.89

Truck AM

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	98	99
1	1.76	1.59	1.69	1.85	1.76	1.53	1.81	1.49	1.63	1.63	1.48	1.60	1.62	1.87	1.83	2.01	2.01	2.00	1.94	1.50
2	1.92	1.73	1.82	2.17	1.92	1.81	1.91	1.76	1.63	1.98	1.74	1.80	1.81	1.99	1.89	2.01	2.01	2.00	1.86	1.50
3	1.65	1.65	1.80	2.05	1.68	1.69	1.82	1.69	1.73	2.02	1.49	1.68	1.62	1.87	1.64	1.63	2.03	2.00	1.53	1.50
4	1.79	1.84	1.80	1.84	2.01	1.77	1.95	1.74	1.69	1.96	1.49	1.59	1.62	2.03	1.91	1.63	1.63	2.00	1.96	1.50
5	1.97	1.88	1.76	1.78	1.74	1.38	1.89	1.73	1.78	1.96	1.73	1.59	1.62	2.03	1.79	1.63	1.63	2.00	1.59	1.50
6	1.66	1.66	2.04	1.78	1.69	1.78	1.58	1.95	1.88	1.84	1.57	1.60	1.62	1.63	1.65	1.63	1.63	2.00	1.53	1.50
7	1.76	1.70	1.76	1.84	1.70	1.71	1.75	1.45	1.64	1.69	1.56	1.61	1.62	1.66	1.71	1.63	1.63	1.60	1.44	1.50
8	1.43	1.54	1.52	1.67	1.47	1.43	1.53	1.76	1.43	1.48	1.58	1.71	1.63	1.57	1.54	1.63	1.63	1.60	1.47	1.55
9	1.72	1.77	2.07	1.88	1.69	1.35	1.69	2.00	1.77	2.20	1.70	1.77	1.62	1.64	1.70	1.63	1.63	2.00	1.67	1.50
10	1.47	1.55	1.58	1.63	1.58	1.61	1.39	1.55	1.61	1.81	1.81	1.46	1.92	1.58	1.56	1.78	1.83	1.60	1.80	1.88
11	1.43	1.53	1.45	1.66	1.57	1.59	1.43	1.62	1.59	1.50	1.82	1.51	1.87	1.57	1.54	1.63	1.66	1.60	1.44	1.87
12	1.52	1.58	1.53	1.53	1.57	1.59	1.62	1.76	1.77	1.64	1.51	1.74	1.66	1.58	1.59	1.74	1.76	1.60	1.44	1.61
13	1.71	1.67	1.72	1.87	1.64	1.64	1.71	1.77	1.87	1.98	1.83	1.75	1.76	1.62	1.68	1.67	1.65	2.00	1.44	1.93
14	1.87	1.75	2.10	2.13	1.85	1.81	1.72	1.73	1.65	1.79	1.55	1.60	1.62	1.81	1.87	1.62	1.62	2.00	1.85	1.50
15	1.72	1.56	1.64	1.80	2.11	1.91	1.81	1.49	1.63	1.95	1.48	1.60	1.62	1.76	1.81	2.01	2.01	2.00	2.03	1.50
16	1.63	1.63	1.63	2.02	1.57	1.57	1.63	1.75	2.02	1.85	1.72	1.61	1.84	1.58	1.65	1.79	1.65	2.00	1.44	2.01
17	1.58	1.61	1.58	1.80	1.58	1.58	1.58	1.67	1.80	1.72	1.64	1.60	1.79	1.58	1.62	1.72	1.81	2.00	1.44	2.17
18	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	1.80	1.87
98	1.98	1.67	1.48	2.02	1.63	1.59	1.47	1.47	1.47	1.83	1.47	1.47	1.47	2.00	2.20	1.47	1.47	1.83	2.02	2.02
99	1.62	1.63	1.63	1.62	1.62	1.62	1.62	1.66	1.62	1.69	1.75	1.83	2.07	1.62	1.62	2.37	2.36	2.03	2.02	2.02

PM Car

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	98	99
1	1.83	1.89	1.92	1.78	1.75	1.98	1.98	1.94	1.95	2.15	1.99	2.10	2.04	1.79	1.74	1.99	1.99	2.00	1.94	1.94
2	1.77	1.83	1.95	1.87	1.84	2.07	2.07	2.03	2.03	2.16	2.16	2.16	2.16	1.82	1.76	2.16	2.16	2.00	1.94	1.94
3	1.85	1.85	1.83	1.81	1.78	1.99	1.99	1.95	1.96	2.15	1.99	2.10	2.04	1.82	1.84	1.99	1.99	2.00	1.94	1.94
4	1.80	1.83	1.84	1.88	1.83	1.85	1.95	1.96	1.90	2.15	2.04	1.90	2.04	1.84	1.79	2.04	2.04	2.00	1.94	1.94
5	1.83	1.86	1.87	1.88	1.88	1.85	2.02	1.91	1.94	2.15	1.98	1.83	2.04	1.85	1.82	1.83	1.83	2.00	1.94	1.94
6	2.02	2.02	1.95	2.00	1.88	1.88	1.83	1.99	1.87	2.15	2.02	1.83	2.04	2.00	2.02	1.83	1.83	2.00	1.94	1.94
7	2.00	2.00	2.00	2.10	1.77	1.95	1.88	2.03	2.08	2.04	1.99	1.80	2.04	2.00	2.00	2.02	2.02	2.00	1.94	1.94
8	1.98	1.98	1.98	1.98	1.96	1.93	1.91	1.88	1.94	1.81	1.83	1.97	2.04	2.02	1.98	2.02	2.02	2.00	1.94	1.94
9	1.90	1.83	1.85	2.06	2.06	1.97	1.98	1.92	1.88	2.07	1.97	2.06	2.04	2.02	1.79	2.01	2.01	2.00	1.94	1.94
10	2.07	2.07	2.07	2.07	2.06	2.03	1.96	1.74	2.05	1.84	1.93	1.93	1.99	2.07	2.07	1.91	2.02	2.00	1.94	1.94
11	1.90	1.90	1.94	2.10	2.06	1.96	1.97	1.88	1.95	1.81	1.84	1.73	2.00	2.02	1.85	2.02	2.02	2.00	1.94	1.94
12	1.98	1.98	1.98	2.10	1.85	1.85	1.91	1.97	2.05	2.04	1.84	1.84	2.06	1.82	1.98	1.91	2.02	2.00	1.94	1.94
13	1.92	1.92	1.94	2.10	1.92	1.87	2.00	1.99	2.02	1.89	1.84	1.98	1.84	1.92	1.92	1.76	1.71	2.00	1.94	1.94
14	1.80	1.79	1.84	1.74	1.76	1.80	1.93	1.93	1.85	2.15	2.04	1.81	2.04	1.84	1.78	2.04	2.04	2.00	1.94	1.94
15	1.92	1.86	1.89	1.76	1.73	1.96	1.96	1.92	1.92	2.15	1.99	2.10	2.04	1.77	1.84	1.99	1.99	2.00	1.94	1.94
16	1.90	1.90	1.94	2.12	1.88	1.82	1.93	1.94	1.95	1.86	1.87	1.93	1.83	1.80	1.77	1.84	1.70	2.00	1.94	1.94
17	1.90	1.90	1.94	2.12	1.88	1.82	1.93	1.94	1.95	1.86	1.87	1.93	1.84	1.80	1.77	2.05	1.84	2.00	1.94	1.94
18	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	1.94	1.94
98	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94
99	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94	1.94

PM Truck

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	98	99
1	1.90	2.00	2.57	1.89	1.89	2.13	2.16	1.66	2.03	2.05	2.07	2.26	2.00	1.89	2.01	2.35	2.35	2.00	2.07	2.07
2	1.63	1.90	2.22	2.12	2.12	2.24	2.25	2.01	2.35	2.20	2.21	2.30	2.18	1.96	1.77	2.35	2.35	2.00	2.07	2.07
3	2.87	2.27	1.90	2.38	2.38	2.13	2.16	2.01	2.03	2.05	2.07	2.26	2.00	2.22	2.39	2.03	2.03	2.00	2.07	2.07
4	2.05	2.07	2.05	1.92	2.02	1.87	2.16	1.66	2.06	2.05	2.07	1.89	2.00	2.00	2.00	2.03	2.03	2.00	2.07	2.07
5	2.02	2.05	2.20	1.94	1.92	1.86	2.04	1.82	2.03	2.02	2.03	1.89	2.00	2.00	2.02	2.03	2.03	2.00	2.07	2.07
6	1.99	2.04	1.99	1.94	1.95	1.92	1.97	1.87	1.86	2.02	2.03	1.89	2.00	1.97	1.95	2.03	2.03	2.00	2.07	2.07
7	2.26	2.18	2.26	2.26	1.77	1.99	1.92	2.33	2.29	2.02	2.02	1.89	2.00	2.07	2.08	2.03	2.03	2.00	2.07	2.07
8	2.07	2.09	2.07	2.17	2.11	1.94	2.05	1.92	1.95	2.05	2.06	2.15	2.00	2.08	1.99	2.03	2.03	2.00	2.07	2.07
9	2.03	2.10	2.03	2.27	2.13	2.09	1.90	1.81	1.92	2.05	2.06	2.15	2.00	2.09	1.91	2.03	2.03	2.00	2.07	2.07
10	2.27	2.19	2.27	2.27	2.26	2.32	1.95	2.29	2.32	1.92	2.07	2.07	2.04	2.15	2.09	2.03	2.03	2.00	2.07	2.07
11	2.33	2.10	2.33	2.00	2.04	2.00	2.38	2.10	2.00	2.05	1.92	1.78	2.00	2.09	1.91	2.03	2.03	2.00	2.07	2.07
12	2.33	2.22	2.33	2.33	2.35	2.35	2.38	2.12	2.36	2.02	1.92	1.92	2.02	2.12	2.12	2.03	2.03	2.00	2.07	2.07
13	2.17	2.14	2.17	2.27	2.26	2.26	2.17	2.14	2.27	2.12	2.02	2.11	1.92	2.14	2.04	2.11	1.91	2.00	2.07	2.07
14	2.00	1.98	2.19	2.00	2.00	1.94	2.08	1.83	2.03	2.02	2.04	1.93	2.00	1.92	1.95	2.00	2.00	2.00	2.07	2.07
15	2.00	1.99	1.98	1.89	1.89	2.13	2.16	2.16	2.03	2.05	2.07	2.26	2.00	1.89	1.92	2.35	2.35	2.00	2.07	2.07
16	2.03	2.10	2.03	2.38	2.35	2.35	2.03	2.10	2.38	2.06	2.09	1.96	2.03	2.12	1.91	1.92	1.70	2.00	2.07	2.07
17	2.05	2.08	2.05	2.22	2.20	2.20	2.05	2.08	2.22	2.06	2.07	2.01	2.05	2.10	1.98	2.28	1.92	2.00	2.07	2.07
18	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.07	2.07
98	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07
99	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07

Appendix C

Sector-to-Sector JTW Adjustment Factors

Sector 98 includes the northern external zones while Sector 99 includes the southern external zones.

AM

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	98	99
1	0.85	1.02	1.12	0.86	0.75	1.22	1.32	1.56	1.71	0.00	1.71	1.85	0.00	0.50	0.98	0.77	0.00	1.00	1.00	1.00
2	0.59	0.77	1.19	0.58	0.33	0.97	2.47	1.85	2.53	1.07	1.93	2.70	0.28	0.18	1.34	4.54	0.00	1.00	1.00	1.00
3	1.19	0.97	0.95	0.77	0.33	0.65	1.17	1.05	1.32	0.10	1.19	0.84	0.32	0.44	0.58	1.82	0.00	1.00	1.00	1.00
4	0.75	0.57	1.13	1.02	0.93	1.54	1.60	1.17	0.94	0.28	1.35	1.22	2.34	0.35	0.04	2.27	0.00	1.00	1.00	1.00
5	0.04	1.32	1.30	0.90	1.04	0.97	1.10	0.86	1.16	0.24	1.51	0.79	0.00	0.07	5.00	0.00	0.00	1.00	1.00	1.00
6	0.77	1.61	1.95	0.87	0.61	0.98	0.98	0.70	1.19	0.16	1.21	0.87	0.28	0.26	5.00	0.80	0.05	1.00	1.00	1.00
7	0.26	2.12	1.34	0.70	0.83	0.75	0.94	0.68	1.48	0.78	1.41	0.99	0.80	0.17	1.42	0.69	0.28	1.00	1.00	1.00
8	0.35	2.15	0.96	0.39	0.60	0.54	0.97	1.01	1.04	0.68	1.10	1.28	0.69	0.35	0.13	0.89	0.53	1.00	1.00	1.00
9	3.90	5.00	3.54	0.87	1.07	0.75	1.03	0.92	0.82	1.95	0.65	1.21	0.82	1.10	5.00	2.41	0.91	1.00	1.00	1.00
10	0.00	2.85	0.24	1.86	1.42	1.02	0.84	0.71	2.29	0.99	0.89	1.41	1.21	1.34	0.00	1.04	0.09	1.00	1.00	1.00
11	0.13	5.00	1.20	3.25	2.22	1.71	2.00	1.80	1.65	0.59	0.84	0.87	0.64	0.42	5.00	0.88	0.11	1.00	1.00	1.00
12	3.83	5.00	0.53	1.61	1.36	0.84	1.32	1.19	1.40	0.42	0.97	0.90	0.98	0.16	5.00	0.63	0.14	1.00	1.00	1.00
13	0.00	5.00	1.56	0.18	0.00	1.66	3.18	1.56	5.00	0.52	0.63	0.80	0.96	0.00	1.00	0.76	0.06	1.00	1.00	1.00
14	0.87	1.08	0.95	1.42	0.67	1.62	1.18	0.86	1.04	0.07	0.72	2.27	0.00	0.84	0.37	5.00	1.00	1.00	1.00	1.00
15	1.58	5.00	4.36	0.79	0.22	5.00	5.00	4.75	5.00	1.00	0.26	5.00	1.00	1.26	0.74	1.00	1.00	1.00	1.00	1.00
16	5.00	5.00	1.19	0.09	0.00	0.51	5.00	2.56	5.00	0.52	0.89	1.27	1.41	1.54	1.00	0.77	0.42	1.00	1.00	1.00
17	0.00	0.00	0.00	0.00	0.00	1.62	3.91	3.87	5.00	2.44	0.83	0.96	1.18	0.00	1.00	0.78	0.94	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

IP

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	98	99
1	0.94	1.01	1.17	1.03	0.36	0.97	1.62	1.52	2.02	0.00	0.76	2.26	0.00	0.69	1.25	4.65	0.00	1.00	1.00	1.00
2	1.05	0.97	1.10	0.99	0.98	1.52	2.65	2.04	2.09	2.77	1.82	2.74	1.73	0.71	3.85	3.41	0.00	1.00	1.00	1.00
3	1.23	1.07	1.04	1.15	0.53	1.11	1.71	1.20	1.38	0.32	0.98	1.01	0.24	0.75	2.83	0.58	0.00	1.00	1.00	1.00
4	0.59	0.84	1.13	1.26	0.97	1.31	1.54	1.32	1.12	0.37	0.90	1.25	0.97	1.00	0.32	0.77	0.00	1.00	1.00	1.00
5	0.25	1.03	0.65	0.91	1.17	1.16	1.53	1.24	1.04	0.29	1.36	1.76	0.00	0.24	2.02	0.00	0.00	1.00	1.00	1.00
6	1.49	1.90	1.44	1.29	1.04	1.03	0.90	0.74	0.51	0.60	1.35	2.00	0.56	0.81	5.00	0.58	0.47	1.00	1.00	1.00
7	1.51	2.49	1.75	1.23	1.47	0.91	0.97	0.71	0.68	1.51	1.50	2.51	2.01	0.70	5.00	2.33	1.41	1.00	1.00	1.00
8	1.21	1.87	1.16	0.96	1.18	0.69	0.70	1.01	0.69	1.52	1.32	1.64	1.64	0.72	1.90	2.08	2.51	1.00	1.00	1.00
9	3.58	3.24	2.32	1.36	1.08	0.62	0.74	0.81	0.35	1.36	0.86	1.28	1.32	3.00	5.00	1.72	1.20	1.00	1.00	1.00
10	0.00	1.54	0.21	0.29	0.30	0.62	1.67	1.69	1.98	1.05	0.67	0.62	0.55	0.25	0.00	0.36	0.44	1.00	1.00	1.00
11	0.27	0.96	0.50	0.67	1.98	1.48	1.56	1.48	0.81	0.73	0.80	0.83	0.84	0.29	1.74	1.16	0.74	1.00	1.00	1.00
12	2.54	2.71	0.87	2.35	2.85	2.13	2.26	1.57	1.08	0.81	0.90	0.94	1.12	1.07	5.00	1.53	0.92	1.00	1.00	1.00
13	0.00	1.45	0.18	1.47	0.00	1.34	2.39	1.50	3.09	0.53	0.82	0.96	1.01	0.00	1.00	1.03	0.53	1.00	1.00	1.00
14	0.70	0.79	0.80	1.28	0.34	0.85	0.95	1.01	2.07	0.32	0.53	0.58	0.00	1.06	0.41	5.00	0.00	1.00	1.00	1.00
15	1.65	3.08	2.73	0.37	1.13	3.56	5.00	2.30	5.00	0.00	2.26	5.00	1.00	0.43	0.70	1.00	1.00	1.00	1.00	1.00
16	4.97	2.29	0.32	0.71	0.00	0.76	2.65	1.79	3.57	0.27	0.87	1.36	1.20	5.00	1.00	0.92	0.61	1.00	1.00	1.00
17	0.00	0.00	0.00	0.00	0.00	0.87	1.56	2.11	2.44	0.49	0.62	0.84	0.71	0.00	1.00	0.66	0.99	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

PM

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	98	99
1	0.71	0.61	0.80	0.42	0.02	0.46	0.65	1.27	2.92	0.00	0.95	5.00	0.00	0.85	1.93	5.00	0.00	1.00	1.00	1.00
2	1.27	0.80	0.88	0.72	1.04	2.03	3.92	3.62	4.10	3.67	5.00	5.00	4.00	1.32	5.00	5.00	0.00	1.00	1.00	1.00
3	1.12	1.14	0.83	0.94	0.87	1.13	1.61	1.08	1.55	0.29	0.78	0.59	0.16	1.40	5.00	0.15	0.00	1.00	1.00	1.00
4	0.45	0.44	1.38	1.06	0.80	0.87	0.80	0.49	1.28	0.76	2.22	1.29	0.10	1.52	0.44	0.07	0.00	1.00	1.00	1.00
5	0.49	0.36	0.52	1.08	0.97	0.55	0.79	0.51	0.98	1.20	2.42	1.39	0.00	1.08	0.18	0.00	0.00	1.00	1.00	1.00
6	2.80	1.35	1.37	0.99	0.93	0.96	0.77	0.61	0.69	0.73	1.23	1.19	0.77	0.57	5.00	0.30	0.99	1.00	1.00	1.00
7	3.11	2.87	1.95	1.17	1.44	1.01	0.92	0.75	0.96	1.32	1.36	1.51	1.30	0.64	5.00	1.74	1.30	1.00	1.00	1.00
8	2.94	1.85	1.42	1.17	1.18	0.87	0.62	0.91	0.96	1.20	1.27	1.17	1.05	0.81	5.00	1.43	2.16	1.00	1.00	1.00
9	2.84	1.93	1.40	1.16	1.47	1.11	1.36	1.47	0.83	1.45	1.05	2.54	2.74	1.43	5.00	3.40	2.98	1.00	1.00	1.00
10	0.00	0.64	0.08	0.11	0.11	0.11	0.50	0.63	1.50	0.92	0.56	0.33	0.45	0.02	0.00	0.45	2.13	1.00	1.00	1.00
11	3.03	3.58	2.65	1.63	1.21	1.70	1.18	0.85	1.00	0.75	0.91	0.75	0.79	0.95	1.25	1.35	1.26	1.00	1.00	1.00
12	5.00	5.00	2.79	0.83	0.77	1.22	1.48	1.53	1.87	1.06	1.05	0.89	1.17	1.15	5.00	2.00	1.49	1.00	1.00	1.00
13	0.00	0.63	0.84	1.09	0.00	0.34	1.00	0.76	1.25	0.76	0.78	0.92	0.86	0.00	1.00	1.23	1.02	1.00	1.00	1.00
14	0.52	0.24	0.77	0.31	0.05	0.19	0.15	0.29	1.14	0.32	0.17	0.10	0.00	0.79	0.90	0.44	0.00	1.00	1.00	1.00
15	2.07	2.01	0.59	0.02	1.88	5.00	5.00	0.50	5.00	0.00	1.00	1.00	1.00	0.24	0.73	1.00	1.00	1.00	1.00	1.00
16	5.00	5.00	4.91	1.05	0.00	0.99	0.85	0.94	3.10	0.55	1.04	0.58	0.74	5.00	1.00	0.77	0.77	1.00	1.00	1.00
17	1.00	0.00	0.00	0.00	0.00	0.06	0.35	0.59	1.17	0.05	0.15	0.14	0.06	1.00	1.00	0.41	0.93	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Appendix D

OD Demand Adjustment - Sector-to-Sector Changes

Sector 98 includes the northern external zones while Sector 99 includes the southern external zones.

AM – Differences (Increase in black, decrease in red, and no change in grey)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	98	99	Sum
1	+1,489	+1,386	-1,351	-161	-43	-67	-74	-24	-65	-4	-16	-40	-3	-192	-195	-7	-1	+0	-75	-13	+543
2	+588	+317	-2,134	-7	-5	+83	+147	+190	+1,718	+2	+11	+25	+7	+45	+47	+1	+1	+0	+20	-3	+1,053
3	-196	-245	+3,482	+75	-8	-500	-445	-154	-672	-6	-8	-28	+6	+14	-31	-2	+1	+0	-30	+6	+1,258
4	-13	+203	-49	+1,563	+1,284	+300	-118	-13	-83	-33	-17	+121	+10	+82	-9	-3	+0	+0	-2	+13	+3,236
5	+32	+281	+2	+776	+264	+56	+253	-57	-1,384	-4	+76	+62	-0	-135	-2	-5	-0	+0	-1	+4	+218
6	+24	+265	+102	-187	+468	-912	-25	+61	+169	-35	+198	+37	-15	-110	+4	-24	-2	+0	+28	-42	+4
7	+23	-124	-151	-235	+41	-359	-578	+461	-899	-97	+170	+153	-29	-62	-7	-33	-3	+0	+3	-40	-1,766
8	+8	-433	-517	-199	-6	-307	+38	+3,051	+701	-377	-78	-188	+78	-58	-20	+0	+3	+0	-10	+21	+1,708
9	+57	+326	+317	-286	+4	-341	-210	+531	+1,302	-81	+35	+222	+51	-104	+8	-8	+2	+0	+62	+26	+1,912
10	+2	-82	-60	-100	+23	-353	+441	+625	-2,739	+732	+1,133	-13	+207	-17	-2	+44	+8	+0	-20	+75	-95
11	+59	-280	-251	+13	+56	+164	+301	+914	-858	-717	+305	-817	+234	-4	-2	+31	+8	+0	-3	+41	-807
12	+1	-234	-303	-72	+31	+175	+592	-779	-584	-715	-415	-2,249	-474	-50	-29	-276	-33	+0	-52	-222	-5,688
13	+1	-14	-17	-1	+10	+43	+264	+635	-317	+137	-43	-47	-312	-2	-0	-151	-5	+0	-10	-41	+131
14	-319	-393	-385	-458	-113	-306	-291	-188	-850	-19	-55	-25	-3	+20	-64	-10	-1	+0	-3	-17	-3,479
15	-157	+193	-177	-15	-5	-16	-21	-10	-116	-2	-3	+4	-2	-66	+0	-2	-1	+0	+0	-15	-411
16	-2	-11	-12	-3	+5	+3	-3	+158	-168	-60	-373	-842	-1,030	-2	-0	+72	-153	+0	-23	-27	-2,471
17	-0	-1	-2	-1	+1	+2	+2	+35	-25	-11	-50	-75	-121	-0	-0	+47	+1	+0	+0	+2	-196
18	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
98	-14	+52	-59	-2	-3	-15	-22	-28	-93	-3	-11	+28	-14	-7	+0	-17	-1	+0	+0	-21	-228
99	-6	-58	-74	-1	+5	+18	-52	-40	-291	-1	-157	-45	-169	-21	-17	+191	+0	+0	-19	+0	-737
Sum	+1,577	+1,149	-1,638	+699	+2,010	-2,331	+201	+5,368	-5,255	-1,296	+704	-3,717	-1,580	-670	-321	-152	-178	+0	-134	-252	-5,815

AM - % Differences (Increase in black, decrease in red, and no change in grey)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	98	99	Sum
1	+8%	+30%	-47%	-24%	-35%	-26%	-21%	-8%	-4%	-21%	-15%	-13%	-12%	-25%	-35%	-27%	-16%	+0%	-33%	-19%	+2%
2	+28%	+1%	-16%	-0%	-1%	+19%	+17%	+32%	+38%	+2%	+5%	+4%	+13%	+9%	+16%	+1%	+6%	+0%	+35%	-2%	+2%
3	-20%	-2%	+7%	+5%	-1%	-22%	-19%	-10%	-8%	-3%	-2%	-2%	+4%	+8%	-25%	-2%	+4%	+0%	-30%	+2%	+1%
4	-4%	+6%	-2%	+4%	+21%	+7%	-3%	-1%	-1%	-15%	-2%	+8%	+9%	+5%	-20%	-3%	+2%	+0%	-10%	+7%	+5%
5	+40%	+33%	+0%	+10%	+2%	+1%	+12%	-5%	-30%	-3%	+19%	+4%	-1%	-46%	-7%	-13%	-3%	+0%	-17%	+3%	+1%
6	+46%	+28%	+6%	-5%	+10%	-3%	-0%	+1%	+1%	-12%	+16%	+1%	-8%	-47%	+27%	-22%	-10%	+0%	+40%	-16%	+0%
7	+34%	-18%	-13%	-20%	+4%	-4%	-2%	+5%	-9%	-13%	+7%	+3%	-9%	-36%	-20%	-20%	-11%	+0%	+11%	-16%	-2%
8	+5%	-34%	-24%	-28%	-2%	-12%	+0%	+6%	+6%	-14%	-2%	-3%	+15%	-38%	-33%	+0%	+7%	+0%	-14%	+5%	+2%
9	+45%	+32%	+15%	-16%	+1%	-5%	-3%	+9%	+7%	-14%	+3%	+8%	+13%	-48%	+24%	-3%	+5%	+0%	+48%	+6%	+4%
10	+8%	-40%	-30%	-35%	+19%	-31%	+15%	+9%	-40%	+2%	+9%	-0%	+19%	-32%	-20%	+11%	+17%	+0%	-21%	+24%	-0%
11	+33%	-23%	-16%	+6%	+35%	+19%	+12%	+20%	-31%	-10%	+2%	-6%	+11%	-15%	-3%	+7%	+14%	+0%	-12%	+15%	-1%
12	+1%	-21%	-22%	-7%	+5%	+9%	+9%	-8%	-13%	-23%	-4%	-4%	-10%	-27%	-28%	-25%	-21%	+0%	-26%	-18%	-5%
13	+31%	-37%	-25%	-1%	+38%	+22%	+31%	+41%	-46%	+15%	-1%	-1%	-2%	-32%	-9%	-10%	-3%	+0%	-28%	-7%	+0%
14	-30%	-24%	-44%	-15%	-46%	-49%	-46%	-45%	-49%	-36%	-46%	-15%	-19%	+0%	-38%	-47%	-42%	+0%	-15%	-49%	-20%
15	-21%	+30%	-48%	-20%	-50%	-49%	-37%	-31%	-44%	-31%	-26%	+4%	-20%	-29%	+0%	-22%	-14%	+0%	+0%	-45%	-3%
16	-38%	-47%	-38%	-13%	+22%	+5%	-1%	+19%	-48%	-19%	-28%	-24%	-35%	-28%	-4%	+0%	-13%	+0%	-46%	-3%	-8%
17	-20%	-40%	-33%	-11%	+32%	+12%	+3%	+21%	-47%	-14%	-26%	-16%	-34%	-26%	-4%	+3%	+0%	+0%	+0%	+2%	-4%
18	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%
98	-16%	+44%	-43%	-10%	-43%	-36%	-35%	-35%	-41%	-40%	-29%	+14%	-27%	-27%	+0%	-40%	-29%	+0%	+0%	-49%	-18%
99	-38%	-49%	-39%	-1%	+40%	+20%	-22%	-10%	-48%	-2%	-42%	-4%	-42%	-48%	-45%	+21%	+1%	+0%	-49%	+0%	-16%
Sum	+7%	+2%	-2%	+1%	+7%	-3%	+0%	+5%	-5%	-3%	+1%	-3%	-6%	-6%	-3%	-1%	-6%	+0%	-11%	-4%	-1%

IP – Differences (Increase in black, decrease in red, and no change in grey)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	98	99	Sum
1	+24	+80	-73	-52	-10	+7	+4	+10	+90	-11	-5	-34	-4	-133	-65	-12	-1	+0	-18	-22	-223
2	+135	-95	-168	-353	-81	+2	+15	+41	+237	-26	-12	-66	-7	-181	-21	-17	-2	+0	-12	-38	-649
3	-48	+210	+1,699	-261	-143	-154	-84	-27	-19	-105	-89	-181	-37	-105	-14	-38	-5	+0	-27	-67	+504
4	-88	-128	+38	-752	+394	-63	-140	-48	-174	-49	-48	-70	-13	-140	-10	-19	-3	+0	-22	-58	-1,394
5	-8	+0	+45	+251	+211	-140	-76	-25	-147	-15	-16	-6	-5	-57	-2	-8	-2	+0	-6	-28	-34
6	+11	+50	+146	-14	+302	-616	-24	-17	+124	-59	-72	+38	-24	-52	-1	-24	-4	+0	+3	-62	-294
7	-1	-0	+21	-155	+38	-231	-576	-581	+75	-158	-154	+49	-50	-41	-2	-40	-6	+0	+5	-62	-1,869
8	-9	-38	-57	-176	-58	-336	-771	+1,011	-321	-364	+171	-12	+40	-36	-3	-8	-1	+0	-5	-11	-983
9	+82	+163	+394	-258	-146	-237	-6	+209	+711	-329	-208	-354	-86	-82	+0	-71	-10	+0	+16	-147	-359
10	-25	-104	-152	-103	-38	-120	-289	-433	-316	-105	+850	-253	-2	-21	-4	-40	-4	+0	-15	-19	-1,193
11	+7	-18	-13	-66	-16	-99	-60	+372	-304	+328	+228	-444	+82	-33	-4	-18	-1	+0	-6	-3	-68
12	-28	-67	-100	-12	+22	+50	+281	+158	-561	-4	-770	-72	-164	-26	-19	-175	-20	+0	-47	-143	-1,696
13	+1	+1	+3	-1	+1	-1	+31	+131	-17	+2	+48	-107	-187	-1	-0	-146	-11	+0	-1	-30	-284
14	-147	-223	-140	-158	-65	-90	-43	-28	-130	-13	-18	-50	-6	-25	-46	-10	-1	+0	-5	-17	-1,215
15	-12	-2	-8	-9	-2	-1	-1	+0	+5	-1	-1	-19	-1	-54	+0	-3	-1	+0	+0	-10	-120
16	-0	-2	-3	-3	-2	-5	-2	+41	-24	-50	-110	-256	-218	-1	-0	+37	-86	+0	-12	+50	-647
17	+0	-0	-0	-1	-0	-1	+0	+10	-3	-4	-11	-25	-15	-0	-0	-94	-2	+0	-0	+0	-145
18	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
98	-6	-0	-7	-11	-7	-6	-2	+1	+20	-15	-6	-45	-3	-5	+0	-10	-1	+0	+0	-42	-145
99	+1	-8	-6	-27	+2	-49	-19	+45	-129	-0	-49	-61	-50	-10	-7	+60	+1	+0	-25	+0	-330
Sum	-112	-179	+1,616	-2,160	+402	-2,091	-1,761	+872	-883	-979	-273	-1,966	-750	-1,003	-198	-636	-158	+0	-177	-706	-11,145

IP - % Differences (Increase in black, decrease in red, and no change in grey)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	98	99	Sum
1	+0%	+6%	-11%	-25%	-14%	+8%	+6%	+14%	+32%	-32%	-7%	-24%	-13%	-31%	-22%	-34%	-28%	+0%	-19%	-28%	-1%
2	+11%	-0%	-2%	-27%	-24%	+1%	+5%	+15%	+28%	-20%	-5%	-17%	-9%	-30%	-16%	-26%	-22%	+0%	-16%	-25%	-2%
3	-8%	+3%	+5%	-25%	-24%	-15%	-12%	-4%	-1%	-40%	-22%	-27%	-28%	-34%	-26%	-39%	-31%	+0%	-23%	-36%	+1%
4	-34%	-10%	+4%	-3%	+11%	-3%	-19%	-12%	-11%	-42%	-22%	-11%	-24%	-16%	-38%	-39%	-38%	+0%	-45%	-38%	-4%
5	-14%	+0%	+10%	+7%	+2%	-5%	-11%	-10%	-16%	-15%	-15%	-2%	-23%	-45%	-24%	-37%	-32%	+0%	-23%	-38%	-0%
6	+28%	+19%	+21%	-1%	+10%	-3%	-0%	-1%	+2%	-21%	-12%	+4%	-19%	-43%	-12%	-37%	-28%	+0%	+8%	-38%	-1%
7	-2%	-0%	+4%	-20%	+6%	-4%	-3%	-9%	+2%	-20%	-19%	+2%	-23%	-35%	-18%	-36%	-29%	+0%	+12%	-38%	-4%
8	-16%	-15%	-11%	-33%	-25%	-23%	-11%	+4%	-7%	-22%	+10%	-0%	+13%	-34%	-17%	-5%	-3%	+0%	-8%	-4%	-2%
9	+45%	+25%	+23%	-20%	-19%	-5%	-0%	+5%	+5%	-44%	-21%	-21%	-23%	-46%	+2%	-39%	-35%	+0%	+15%	-39%	-1%
10	-36%	-36%	-29%	-44%	-38%	-46%	-43%	-27%	-46%	-1%	+19%	-11%	-0%	-38%	-40%	-18%	-13%	+0%	-47%	-12%	-4%
11	+5%	-4%	-2%	-19%	-22%	-21%	-7%	+21%	-25%	+8%	+2%	-7%	+7%	-32%	-17%	-8%	-2%	+0%	-19%	-2%	-0%
12	-23%	-20%	-16%	-2%	+7%	+6%	+11%	+5%	-27%	-0%	-12%	-0%	-7%	-23%	-37%	-29%	-23%	+0%	-31%	-22%	-3%
13	+26%	+10%	+8%	-2%	+10%	-2%	+20%	+42%	-14%	+0%	+4%	-4%	-2%	-8%	-1%	-18%	-11%	+0%	-5%	-13%	-2%
14	-38%	-33%	-46%	-18%	-39%	-46%	-33%	-33%	-48%	-44%	-30%	-33%	-36%	-1%	-39%	-48%	-39%	+0%	-18%	-50%	-15%
15	-9%	-2%	-15%	-26%	-26%	-11%	-5%	+0%	+15%	-23%	-8%	-29%	-5%	-39%	+0%	-27%	-35%	+0%	+0%	-33%	-1%
16	-16%	-18%	-16%	-18%	-13%	-19%	-3%	+24%	-39%	-17%	-33%	-31%	-25%	-26%	-12%	+0%	-11%	+0%	-38%	+11%	-4%
17	+1%	-5%	-4%	-16%	-1%	-12%	+2%	+33%	-29%	-9%	-24%	-19%	-12%	-22%	-5%	-12%	-0%	+0%	-1%	+1%	-7%
18	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%
98	-7%	-1%	-9%	-31%	-16%	-12%	-6%	+2%	+18%	-38%	-14%	-27%	-12%	-25%	+0%	-36%	-26%	+0%	+0%	-35%	-14%
99	+1%	-7%	-5%	-29%	+3%	-25%	-11%	+22%	-37%	-0%	-30%	-9%	-21%	-47%	-28%	+12%	+2%	+0%	-27%	+0%	-10%
Sum	-1%	-1%	+3%	-6%	+2%	-5%	-4%	+2%	-2%	-3%	-1%	-4%	-5%	-13%	-2%	-4%	-7%	+0%	-17%	-21%	-2%

PM – Differences (Increase in black, decrease in red, and no change in grey)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	98	99	Sum
1	+859	+254	+307	+176	+5	-31	-18	-18	-57	-26	-14	-99	-6	-243	-228	-16	-2	+0	-53	-41	+750
2	-139	+646	-1,802	-497	-156	-678	-319	-248	-460	-266	-159	-387	-55	-331	-180	-43	-4	+0	-36	-178	-5,293
3	-347	+1,274	+2,050	-495	-723	-1,436	-632	-383	-1,315	-329	-211	-485	-78	-291	-152	-58	-9	+0	-76	-143	-3,839
4	+284	-596	-471	+3,439	+1,852	+439	-9	-28	+31	-39	-21	+78	-6	-672	+69	-12	-2	+0	+35	-35	+4,332
5	+26	-127	-35	+1,237	+1,564	+344	+105	-59	-196	-16	-42	-64	+2	-96	+7	+15	+3	+0	+4	+14	+2,685
6	+27	-17	-46	-945	+235	+203	+373	-299	+442	-251	-283	-453	-47	-869	-6	+12	+3	+0	+10	+34	-1,878
7	-263	-896	-1,831	-894	+422	-275	-858	-1,730	-1,684	-1,161	-975	-1,293	-296	-500	-23	-109	-14	+0	-32	-67	-12,480
8	-232	-590	-1,362	-694	-221	-538	+53	+1,784	-603	+64	+264	+407	-287	-273	-17	-255	-53	+0	-35	-268	-2,856
9	-43	-125	-653	-2,270	-1,088	-2,710	-2,996	-2,614	-716	-2,915	-1,603	-3,079	-1,068	-1,470	-34	-548	-87	+0	-137	-436	-24,593
10	-24	-97	-193	-310	-62	-199	-296	-1,002	-609	+574	+1,187	+190	-130	-82	-5	-97	-21	+0	-21	-73	-1,269
11	-95	-406	-950	-203	+13	-287	-473	+324	-718	+596	+54	+2,841	-717	-23	-8	-391	-56	+0	-19	-194	-712
12	-125	-399	-861	+120	+472	+312	+546	+353	-812	-178	-925	+1,352	-721	-67	-39	-349	-37	+0	-134	-174	-1,667
13	-21	-81	-182	-22	+38	+6	+10	+96	-174	+133	+278	+773	-125	-2	-3	-506	-47	+0	-6	-92	+75
14	-269	-264	-142	-240	-97	-185	-92	-63	-233	-49	-27	-98	-8	-235	-141	-9	-2	+0	-11	-18	-2,185
15	-511	-124	-21	+21	-0	-25	-6	-5	-18	-5	-4	-43	-2	-106	+0	-4	-1	+0	+0	-13	-866
16	-21	-76	-179	-22	+26	-8	-11	+13	-155	-56	-107	-97	-361	-3	-3	+69	+20	+0	-9	+218	-761
17	-3	-9	-19	-3	+4	-0	-0	+5	-19	+2	-8	-3	-16	-1	-0	+41	+1	+0	-0	+1	-28
18	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0	+0
98	-95	-38	-32	+29	+8	-30	-14	-59	-119	-20	-20	-145	-2	+2	+0	-20	-0	+0	+0	-42	-594
99	-66	-92	-158	-53	+90	-50	+1	+183	-270	-2	-61	+98	-152	-34	-13	+141	+1	+0	-64	+0	-502
Sum	-1,059	-1,763	-6,581	-1,626	+2,382	-5,147	-4,638	-3,748	-7,687	-3,941	-2,676	-508	-4,074	-5,295	-777	-2,142	-309	+0	-585	-1,508	-51,680

PM - % Differences (Increase in black, decrease in red, and no change in grey)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	98	99	Sum
1	+3%	+10%	+19%	+32%	+3%	-20%	-26%	-27%	-20%	-46%	-21%	-38%	-43%	-19%	-24%	-40%	-39%	+0%	-18%	-50%	+2%
2	-3%	+1%	-9%	-12%	-15%	-33%	-30%	-27%	-21%	-47%	-40%	-38%	-49%	-19%	-31%	-40%	-45%	+0%	-32%	-50%	-6%
3	-10%	+8%	+3%	-13%	-33%	-33%	-32%	-30%	-28%	-42%	-36%	-39%	-43%	-34%	-36%	-40%	-49%	+0%	-32%	-49%	-3%
4	+26%	-25%	-22%	+8%	+24%	+11%	-1%	-5%	+1%	-12%	-5%	+7%	-10%	-23%	+31%	-18%	-19%	+0%	+43%	-33%	+6%
5	+16%	-31%	-9%	+20%	+9%	+6%	+8%	-14%	-11%	-12%	-20%	-10%	+4%	-45%	+23%	+42%	+41%	+0%	+20%	+48%	+8%
6	+11%	-3%	-3%	-17%	+3%	+1%	+4%	-9%	+4%	-32%	-22%	-17%	-12%	-48%	-21%	+8%	+12%	+0%	+13%	+12%	-2%
7	-37%	-37%	-35%	-27%	+17%	-2%	-2%	-11%	-18%	-30%	-30%	-19%	-26%	-49%	-43%	-16%	-17%	+0%	-32%	-20%	-12%
8	-38%	-39%	-38%	-40%	-19%	-16%	+0%	+3%	-10%	+1%	+4%	+4%	-19%	-49%	-36%	-28%	-30%	+0%	-31%	-37%	-3%
9	-3%	-4%	-8%	-33%	-29%	-16%	-20%	-14%	-3%	-45%	-46%	-40%	-49%	-50%	-35%	-40%	-48%	+0%	-36%	-49%	-19%
10	-42%	-46%	-50%	-47%	-19%	-41%	-28%	-35%	-50%	+2%	+13%	+5%	-12%	-50%	-50%	-22%	-22%	+0%	-50%	-41%	-2%
11	-48%	-47%	-48%	-39%	+3%	-32%	-24%	+7%	-48%	+6%	+0%	+24%	-23%	-50%	-40%	-36%	-40%	+0%	-31%	-36%	-1%
12	-34%	-36%	-41%	+5%	+23%	+10%	+9%	+5%	-23%	-2%	-6%	+2%	-10%	-36%	-39%	-11%	-9%	+0%	-34%	-9%	-1%
13	-36%	-49%	-48%	-14%	+31%	+7%	+5%	+29%	-48%	+11%	+12%	+16%	-1%	-29%	-22%	-18%	-14%	+0%	-36%	-15%	+0%
14	-34%	-34%	-43%	-12%	-25%	-47%	-36%	-38%	-47%	-48%	-39%	-27%	-34%	-2%	-42%	-48%	-48%	+0%	-24%	-48%	-13%
15	-43%	-39%	-12%	+26%	-0%	-45%	-19%	-13%	-47%	-50%	-5%	-39%	-10%	-28%	+0%	-22%	-20%	+0%	+0%	-41%	-5%
16	-49%	-50%	-49%	-22%	+29%	-14%	-8%	+6%	-50%	-9%	-17%	-6%	-22%	-50%	-40%	+0%	+1%	+0%	-37%	+18%	-2%
17	-42%	-50%	-50%	-20%	+23%	-3%	-2%	+15%	-48%	+2%	-11%	-2%	-10%	-42%	-31%	+3%	+0%	+0%	-1%	+1%	-1%
18	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%	+0%
98	-46%	-41%	-13%	+35%	+26%	-34%	-33%	-47%	-48%	-50%	-36%	-45%	-8%	+9%	+0%	-42%	-13%	+0%	+0%	-50%	-32%
99	-47%	-49%	-49%	-22%	+48%	-15%	+0%	+28%	-49%	-0%	-20%	+9%	-17%	-49%	-41%	+11%	+1%	+0%	-50%	+0%	-7%
Sum	-2%	-2%	-5%	-2%	+5%	-6%	-5%	-3%	-11%	-5%	-4%	-0%	-11%	-22%	-4%	-6%	-6%	+0%	-26%	-20%	-5%

Appendix E

Static Turn Capacities for Priority Movements

Turn External Id	Number of Approach lanes for this Movement	Intercept	Slope
1x01	x	735	0.37
1x02	x	925	0.35
1x03	x	400	0.18
1x04	x	330	0.15
1x06	x	300	0.08
1x07	x	225	0.05
1x09	x	595	0.29
1x10	x	595	0.25
1x11	x	630	0.27
1x13	x	300	0.08
1x14	x	225	0.05
1x15	x	225	0.05
2xxx	1	1,200	0.7
2xxx	2	2,500	0.8
2xxx	3	3,100	0.8
3x01	x	735	0.37
3x02	x	925	0.35
3x03	x	400	0.18
3x04	x	330	0.15
3x05	x	330	0.15
3x06	x	300	0.08
3x07	x	225	0.05
3x08	x	225	0.05
3x09	x	595	0.29
3x10	x	595	0.25
3x11	x	630	0.27
3x12	x	400	0.18
3x13	x	300	0.08
3x14	x	225	0.05
3x15	x	225	0.05
3x16	x	400	0.18

3x17	x	330	0.15
3x18	x	330	0.15
4x01	x	510	0.21
4x02	x	505	0.09
4x03	x	355	0.15
4x04	x	310	0.14
4x05	x	310	0.14
4x06	x	230	0.05
4x07	x	230	0.05
4x08	x	230	0.05
4x09	x	595	0.29
4x10	x	595	0.25
4x11	x	630	0.27
4312	x	355	0.15
4313	x	230	0.05
4314	x	230	0.05
4315	x	230	0.05
4316	x	355	0.15
4317	x	310	0.14
4318	x	310	0.14
4412	x	355	0.15
4413	x	235	0.16
4414	x	235	0.16
4415	x	230	0.05
4416	x	355	0.15
4417	x	310	0.14
4418	x	310	0.14
5x03	x	500	0.2

Appendix F

Meso Gap-Acceptance Parameters – Intersections

External ID	Initial Safety Margin	Final Safety Margin	Give Way Time Factor	
3301	3.5	0.1	0.8	
3302	3.5	0.1	0.5	
3303	4.7	0.1	1.4	same as 3310
3304	4.7	0.1	1.4	same as 3311
3305	4.7	0.1	1.4	same as 3311
3306	4.8	0.1	7.0	same as 4406
3307	5.2	0.1	5.0	same as 4407
3308	7.8	0.1	9.0	same as 3315
3309	4.0	0.1	1.8	
3310	4.7	0.1	1.4	
3311	4.7	0.1	1.4	
3312	3.5	0.1	0.8	same as 3301
3313	4.2	0.1	10.0	
3314	6.0	0.1	10.0	
3315	7.8	0.1	9.0	
3316	4.5	0.1	3.3	
3317	7.7	0.1	6.7	
3318	8.3	0.1	10.0	
4301	3.5	0.1	0.8	
4302	3.5	0.1	0.5	
4303	4.7	0.1	1.4	same as 4310
4304	4.7	0.1	1.4	same as 4311
4305	4.7	0.1	1.4	same as 4311
4306	4.8	0.1	7.0	same as 4406

4307	5.2	0.1	5.0	same as 4407
4308	7.8	0.1	9.0	same as 4315
4309	4.0	0.1	1.7	
4310	4.7	0.1	1.4	
4311	4.7	0.1	1.4	
4312	3.5	0.1	0.8	same as 4301
4313	5.0	0.1	8.2	
4314	6.7	0.1	9.0	
4315	7.8	0.1	9.0	
4316	5.5	0.1	3.5	
4317	8.0	0.1	10.0	
4318	8.3	0.1	10.0	
4401	3.5	0.1	0.8	
4402	3.5	0.1	0.8	
4403	3.2	0.1	1.4	same as 4410
4404	4.7	0.1	1.4	same as 4311
4405	4.7	0.1	1.4	same as 4311
4406	4.8	0.1	7.0	
4407	5.2	0.1	5.0	
4408	7.8	0.1	9.0	same as 4315
4409	3.2	0.1	1.4	
4410	3.2	0.1	1.4	
4411	4.7	0.1	1.4	same as 4311
4412	3.5	0.1	0.8	same as 4401
4413	4.8	0.1	7.0	
4414	5.2	0.1	5.0	
4415	7.8	0.1	9.0	same as 4315
4416	5.5	0.1	3.5	same as 4316
4417	8.0	0.1	10.0	same as 4317
4418	8.3	0.1	10.0	same as 4318

Appendix G

Meso Gap-Acceptance Parameters – Motorway On-ramps

EXTERNAL ID	INITIAL SAFETY MARGIN	FINAL SAFETY MARGIN	GIVE WAY TIME FACTOR	VISIBILITY ALONG MAINLINE
7001	5	0.1	0.3	50
7002	5	4	0.8	50
7003	5	0.1	0.4	50
7004	5	0.1	0.4	50
7011	2	0.1	0.1	50
7012	5	1	0.5	50
7013	5	0.1	0.4	50
7020	5	0.1	0.8	50

Appendix H

Individual Link Count Validation Results

AM

SL	Location	Road Section	Section ID	07:00 AM - 08:00 AM Obs	Mod	Diff	GEH	08:00 AM - 09:00 AM Obs	Mod	Diff	GEH
1	Rural North_NB	NORTHERN GATEWAY TOLL ROAD	3227581	480	384	-96	4.6	412	482	70	3.3
1	Rural North_NB	HIBISCUS COAST HIGHWAY	3256864	177	93	-84	7.2	162	86	-76	6.8
1	Rural North_NB	KAIPARA COAST HIGHWAY	3233089	107	145	38	3.4	144	183	39	3.1
		Rural North_NB - - Total		764	622	-142	5.4	718	751	33	1.2
1	Rural North_SB	NORTHERN GATEWAY TOLL ROAD	3231486	642	696	54	2.1	577	743	166	6.5
1	Rural North_SB	HIBISCUS COAST HIGHWAY	3256867	194	113	-81	6.5	216	109	-107	8.4
1	Rural North_SB	KAIPARA COAST HIGHWAY	3233094	302	355	53	2.9	312	365	53	2.9
		Rural North_SB - - Total		1138	1164	26	0.8	1105	1217	112	3.3
2	North Shore North_NB	DAIRY FLAT HIGHWAY	3222335	213	354	141	8.4	367	369	2	0.1
2	North Shore North_NB	POSTMAN ROAD	3217257	43	37	-6	0.9	40	24	-16	2.8
2	North Shore North_NB	NORTHERN MOTORWAY	3220624	1243	724	-519	16.5	1111	891	-220	7.0
2	North Shore North_NB	OTEHA VALLEY ROAD ON RAMP	3221042	187	130	-57	4.5	243	132	-111	8.1
2	North Shore North_NB	EAST COAST ROAD	3255497	296	582	286	13.7	312	552	240	11.5
		North Shore North_NB - - Total		1982	1827	-155	3.6	2073	1968	-105	2.3
2	North Shore North_SB	DAIRY FLAT HIGHWAY	3222437	489	363	-126	6.1	354	432	78	3.9
2	North Shore North_SB	POSTMAN ROAD	3217251	62	19	-43	6.8	48	24	-24	4.0
2	North Shore North_SB	NORTHERN MOTORWAY	3229963	1369	997	-372	10.8	1055	892	-163	5.2
2	North Shore North_SB	SILVERDALE ON RAMP	3234539	1643	1389	-254	6.5	1417	1149	-268	7.5
2	North Shore North_SB	EAST COAST ROAD	3260165	563	1138	575	19.7	416	1035	619	23.0
		North Shore North_SB - - Total		4126	3906	-220	3.5	3290	3532	242	4.1
3	Whangaparaoa_EB	WHANGAPARAOA ROAD	3254798	573	727	154	6.0	665	778	113	4.2
3	Whangaparaoa_EB	RED BEACH ROAD	3253562	284	300	16	0.9	518	320	-198	9.7
		Whangaparaoa_EB - - Total		857	1027	170	5.5	1183	1098	-85	2.5
3	Whangaparaoa_WB	WHANGAPARAOA ROAD	3252511	1704	2057	353	8.1	1633	1968	335	7.9
3	Whangaparaoa_WB	RED BEACH ROAD	3254015	784	781	-3	0.1	922	787	-135	4.6
		Whangaparaoa_WB - - Total		2488	2838	350	6.8	2555	2755	200	3.9
4	Rural West_EB	OLD NORTH ROAD	10212500	352	330	-22	1.2	243	363	120	6.9
4	Rural West_EB	SH 16	10222230	680	932	252	8.9	680	814	134	4.9
4	Rural West_EB	KAHIKATEA FLAT ROAD	3239532	412	401	-11	0.5	355	335	-20	1.1
		Rural West_EB - - Total		1444	1663	219	5.6	1278	1512	234	6.3

SL	Location	Road Section	Section ID	07:00 AM - 08:00 AM				08:00 AM - 09:00 AM			
				Obs	Mod	Diff	GEH	Obs	Mod	Diff	GEH
4	Rural West_WB	OLD NORTH ROAD	10210127	90	143	53	4.9	89	175	86	7.5
4	Rural West_WB	SH 16	10222317	337	317	-20	1.1	389	366	-23	1.2
4	Rural West_WB	KAHIKATEA FLAT ROAD	3241427	157	166	9	0.7	203	164	-39	2.9
		Rural West_WB - - Total		584	626	42	1.7	681	705	24	0.9
7	Upper_Harbour_N/S_NB	ALBANY HIGHWAY	3213039	1338	1256	-82	2.3	1098	1044	-54	1.7
7	Upper_Harbour_N/S_NB	CARIBBEAN DRIVE	21172402	362	257	-105	6.0	356	291	-65	3.6
7	Upper_Harbour_N/S_NB	MEADOWOOD DRIVE	21172411	176	228	52	3.7	230	202	-28	1.9
7	Upper_Harbour_N/S_NB	NORTHERN MOTORWAY	10355027	3015	3248	233	4.2	3432	3312	-120	2.1
7	Upper_Harbour_N/S_NB	PARKWAY DRIVE	5811768	482	456	-26	1.2	609	380	-229	10.3
7	Upper_Harbour_N/S_NB	PARKWAY DRIVE	21172430	141	422	281	16.7	220	314	94	5.8
7	Upper_Harbour_N/S_NB	EAST COAST ROAD	21172436	869	950	81	2.7	1192	940	-252	7.7
7	Upper_Harbour_N/S_NB	MATIPO ROAD	3253471	67	67	0	0.0	176	60	-116	10.7
7	Upper_Harbour_N/S_NB	BEACH ROAD	21172442	254	311	57	3.4	472	360	-112	5.5
		Upper_Harbour_N/S_NB - - Total		6704	7195	491	5.9	7785	6903	-882	10.3
7	Upper_Harbour_N/S_SB	ALBANY HIGHWAY	5812239	1499	1546	47	1.2	1532	1531	-1	0.0
7	Upper_Harbour_N/S_SB	CARIBBEAN DRIVE	21172405	428	410	-18	0.9	248	544	296	14.9
7	Upper_Harbour_N/S_SB	MEADOWOOD DRIVE	21172414	202	196	-6	0.4	313	193	-120	7.5
7	Upper_Harbour_N/S_SB	NORTHERN MOTORWAY	10355030	2465	3469	1004	18.4	2880	2680	-200	3.8
7	Upper_Harbour_N/S_SB	PARKWAY DRIVE	5811771	236	106	-130	9.9	231	224	-7	0.5
7	Upper_Harbour_N/S_SB	PARKWAY DRIVE	21172433	360	317	-43	2.3	318	270	-48	2.8
7	Upper_Harbour_N/S_SB	EAST COAST ROAD	21172439	870	1520	650	18.8	1309	1205	-104	2.9
7	Upper_Harbour_N/S_SB	MATIPO ROAD	3253477	117	158	41	3.5	157	87	-70	6.3
7	Upper_Harbour_N/S_SB	BEACH ROAD	21172445	1141	1075	-66	2.0	950	814	-136	4.6
		Upper_Harbour_N/S_SB - - Total		7318	8797	1479	16.5	7938	7548	-390	4.4
9	Takapuna_In	FRED THOMAS DRIVE	5806508	259	150	-109	7.6	379	135	-244	15.2
9	Takapuna_In	ESMONDE ROAD	5806510	1261	1365	104	2.9	1496	1318	-178	4.7
9	Takapuna_In	TAHAROTO ROAD	5805380	785	810	25	0.9	1056	866	-190	6.1
9	Takapuna_In	KITCHENER ROAD	5810962	1182	1667	485	12.9	1277	1304	27	0.8
		Takapuna_In - - Total		3487	3992	505	8.3	4208	3623	-585	9.3
9	Takapuna_Out	ESMONDE ROAD	5806490	1264	1444	180	4.9	1564	1388	-176	4.6
9	Takapuna_Out	TAHAROTO ROAD	5805377	826	446	-380	15.1	1021	786	-235	7.8
9	Takapuna_Out	KITCHENER ROAD	5810965	302	678	376	17.0	468	834	366	14.3
		Takapuna_Out - - Total		2392	2568	176	3.5	3053	3008	-45	0.8
10	Northern E/W_EB	LONELY TRACK ROAD	3220283	124	163	39	3.3	169	129	-40	3.3
10	Northern E/W_EB	OTEHA VALLEY ROAD	3217048	392	370	-22	1.1	539	406	-133	6.1
10	Northern E/W_EB	MCCLYMONTS ROAD	3233107	288	283	-5	0.3	325	299	-26	1.5
10	Northern E/W_EB	ALBANY EXPRESSWAY	3216368	296	828	532	22.4	526	802	276	10.7
10	Northern E/W_EB	ALBANY EXPRESSWAY	3212322	483	338	-145	7.2	349	241	-108	6.3
10	Northern E/W_EB	UPPER HARBOUR HIGHWAY	5811468	680	906	226	8.0	690	1029	339	11.6

SL	Location	Road Section	Section ID	07:00 AM - 08:00 AM				08:00 AM - 09:00 AM			
				Obs	Mod	Diff	GEH	Obs	Mod	Diff	GEH
10	Northern E/W_EB	UPPER HARBOUR HIGHWAY	5811435	1051	1167	116	3.5	1186	842	-344	10.8
10	Northern E/W_EB	ROSEDALE ROAD	3240410	591	581	-10	0.4	967	566	-401	**14.5**
10	Northern E/W_EB	SUNSET ROAD	5812500	845	938	93	3.1	1115	890	-225	7.1
10	Northern E/W_EB	SUNNYNOOK ROAD	5812528	474	372	-102	5.0	746	452	-294	12.0
10	Northern E/W_EB	TRISTRAM AVENUE ON RAMP	5814040	73	435	362	**22.7**	196	572	376	**19.2**
10	Northern E/W_EB	TRISTRAM AVENUE	5814038	554	715	161	6.4	646	681	35	1.4
10	Northern E/W_EB	WAIRAU ROAD	12198193	748	943	195	6.7	612	1197	585	**19.5**
10	Northern E/W_EB	NORTHCOTE ROAD	5817782	1274	1376	102	2.8	1512	1026	-486	**13.6**
10	Northern E/W_EB	AKORANGA DRIVE	5806715	833	651	-182	6.7	912	642	-270	9.7
10	Northern E/W_EB	EXMOUTH ROAD	10618859	262	117	-145	10.5	191	391	200	11.7
10	Northern E/W_EB	ONEWA ROAD	5819870	6	12	6	2.0	9	8	-1	0.3
10	Northern E/W_EB	ONEWA ROAD	5819872	1666	1805	139	3.3	1708	1510	-198	4.9
		Northern E/W_EB - - Total		10640	12000	1360	**12.8**	12398	11683	-715	6.5
10	Northern E/W_WB	LONELY TRACK ROAD	3220279	78	148	70	6.6	92	109	17	1.7
10	Northern E/W_WB	OTEHA VALLEY ROAD	12198187	2008	1704	-304	7.1	1680	1532	-148	3.7
10	Northern E/W_WB	MCCLYMONTS ROAD	12198175	831	941	110	3.7	975	672	-303	10.6
10	Northern E/W_WB	ALBANY EXPRESSWAY	12198172	775	972	197	6.7	1373	1285	-88	2.4
10	Northern E/W_WB	UPPER HARBOUR HIGHWAY	5812153	1584	1312	-272	7.1	1842	1565	-277	6.7
10	Northern E/W_WB	ROSEDALE ROAD	3211527	882	1025	143	4.6	1034	787	-247	8.2
10	Northern E/W_WB	SUNSET ROAD	5811898	683	787	104	3.8	756	649	-107	4.0
10	Northern E/W_WB	SUNNYNOOK ROAD	10617570	542	688	146	5.9	695	727	32	1.2
10	Northern E/W_WB	CROFTFIELD LANE	12198199	192	285	93	6.0	235	216	-19	1.3
10	Northern E/W_WB	TRISTRAM AVENUE	5814078	560	1081	521	**18.2**	857	910	53	1.8
10	Northern E/W_WB	NORTHCOTE ROAD	5816713	396	451	55	2.7	623	503	-120	5.1
10	Northern E/W_WB	WAIRAU ROAD	12198196	689	775	86	3.2	856	1180	324	10.2
10	Northern E/W_WB	AKORANGA DRIVE	5806721	139	166	27	2.2	288	179	-109	7.1
10	Northern E/W_WB	AKORANGA DRIVE	5806723	478	66	-412	**25.0**	511	144	-367	**20.3**
10	Northern E/W_WB	EXMOUTH ROAD	5819919	134	108	-26	2.4	176	72	-104	9.3
10	Northern E/W_WB	ONEWA ROAD OFF RAMP	5807162	49	107	58	6.6	72	114	42	4.4
10	Northern E/W_WB	ONEWA ROAD OFF RAMP	5820901	399	618	219	9.7	449	715	266	11.0
10	Northern E/W_WB	STAFFORD ROAD OFF RAMP	5821190	82	64	-18	2.1	101	72	-29	3.1
		Northern E/W_WB - - Total		10501	11298	797	7.6	12615	11431	-1184	10.8
11	Harbour_EB/NB	NORTHERN MOTORWAY	10274869	4384	4231	-153	2.3	4308	4421	113	1.7
11	Harbour_EB/NB	CURRAN STREET ON RAMP	10274850	630	720	90	3.5	752	709	-43	1.6
11	Harbour_EB/NB	UPPER HARBOUR MOTORWAY	10217229	3372	2362	-1010	**18.9**	2145	2238	93	2.0
11	Harbour_EB/NB		21172396	398	366	-32	1.6	275	302	27	1.6
		Harbour_EB/NB - - Total		8784	7679	-1105	12.2	7480	7670	190	2.2
11	Harbour_WB/SB	NORTHERN MOTORWAY	10274859	7036	7051	15	0.2	6808	7037	229	2.8
11	Harbour_WB/SB	SHELLY BEACH ROAD OFF RAMP	10274855	602	466	-136	5.9	608	367	-241	10.9
11	Harbour_WB/SB	UPPER HARBOUR MOTORWAY	3237819	1672	1536	-136	3.4	1356	1437	81	2.2
11	Harbour_WB/SB	COATESVILLE-RIVERHEAD HIGHWAY	3232882	333	423	90	4.6	308	474	166	8.4

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				Obs	Mod	Diff	GEH	Obs	Mod	Diff	GEH
		Harbour_WB/SB - - Total		9643	9476	-167	1.7	9080	9315	235	2.5
12	Waitakere West_EB	SWANSON ROAD	12198220	1229	1199	-30	0.9	1313	1157	-156	4.4
12	Waitakere West_EB	BORDER ROAD	10232628	699	873	174	6.2	782	742	-40	1.4
12	Waitakere West_EB	HENDERSON VALLEY ROAD	12047859	467	674	207	8.7	562	741	179	7.0
12	Waitakere West_EB	UNIVERSAL DRIVE	12198208	844	1097	253	8.1	1025	1116	91	2.8
12	Waitakere West_EB	LARNOCH ROAD	12198217	311	528	217	10.6	392	504	112	5.3
12	Waitakere West_EB	RATHGAR ROAD	10211897	255	311	56	3.3	574	301	-273	**13.1**
12	Waitakere West_EB	TRIANGLE ROAD	10219227	718	907	189	6.6	778	907	129	4.4
12	Waitakere West_EB	LINCOLN ROAD OFF RAMP	10209598	619	485	-134	5.7	976	326	-650	**25.5**
12	Waitakere West_EB	NORTH-WESTERN MOTORWAY	10209946	1725	2219	494	11.1	1795	2320	525	11.6
12	Waitakere West_EB	TRIANGLE ROAD	12198202	718	943	225	7.8	778	908	130	4.5
		Waitakere West_EB - - Total		7585	9236	1651	**18.0**	8975	9022	47	0.5
12	Waitakere West_WB	SWANSON ROAD	10232716	459	764	305	12.3	655	739	84	3.2
12	Waitakere West_WB	BORDER ROAD	10233566	333	224	-109	6.5	403	235	-168	9.4
12	Waitakere West_WB	HENDERSON VALLEY ROAD	12047847	173	324	151	9.6	332	333	1	0.1
12	Waitakere West_WB	UNIVERSAL DRIVE	10212048	316	528	212	10.3	412	479	67	3.2
12	Waitakere West_WB	LARNOCH ROAD	10217669	155	137	-18	1.5	305	168	-137	8.9
12	Waitakere West_WB	RATHGAR ROAD	10211200	250	267	17	1.1	398	267	-131	7.2
12	Waitakere West_WB	TRIANGLE ROAD	12198205	150	74	-76	7.2	239	59	-180	**14.7**
12	Waitakere West_WB	NORTH-WESTERN MOTORWAY	10225485	1490	1294	-196	5.3	1346	1472	126	3.4
12	Waitakere West_WB	LINCOLN ROAD ON RAMP	10213816	975	777	-198	6.7	813	666	-147	5.4
12	Waitakere West_WB	TRIANGLE ROAD	10208035	150	73	-77	7.3	239	57	-182	**15.0**
		Waitakere West_WB - - Total		4451	4462	11	0.2	5142	4475	-667	9.6
14	Central Waitakere E/W_EB	NORTH-WESTERN MOTORWAY	81102839	3983	4330	347	5.4	3837	4425	588	9.1
14	Central Waitakere E/W_EB	TE ATATU ROAD ON RAMP	10208608	1263	1241	-22	0.6	1009	899	-110	3.6
14	Central Waitakere E/W_EB	BUTTERWORTH DRIVE	10234034	292	229	-63	3.9	341	210	-131	7.9
14	Central Waitakere E/W_EB	GREAT NORTH ROAD	10233852	1629	2093	464	10.8	1744	2042	298	6.8
14	Central Waitakere E/W_EB	WEST COAST ROAD	10239481	1056	1437	381	10.8	981	1402	421	12.2
14	Central Waitakere E/W_EB	OATES ROAD	10239843	443	167	-276	**15.8**	476	118	-358	**20.8**
14	Central Waitakere E/W_EB	KAURILANDS ROAD	10235685	400	475	75	3.6	539	361	-178	8.4
		Central Waitakere E/W_EB - - Total		9066	9972	906	9.3	8927	9457	530	5.5
14	Central Waitakere E/W_WB	NORTH-WESTERN MOTORWAY	10210303	1931	1399	-532	**13.0**	1871	1571	-300	7.2
14	Central Waitakere E/W_WB	TE ATATU ROAD OFF RAMP	10208443	733	801	68	2.5	751	916	165	5.7
14	Central Waitakere E/W_WB	BUTTERWORTH DRIVE	10234039	108	84	-24	2.4	200	79	-121	10.2
14	Central Waitakere E/W_WB	GREAT NORTH ROAD	10233038	1069	1599	530	**14.5**	1302	1702	400	10.3
14	Central Waitakere E/W_WB	WEST COAST ROAD	10238752	686	921	235	8.3	896	861	-35	1.2
14	Central Waitakere E/W_WB	OATES ROAD	10239847	136	141	5	0.4	312	183	-129	8.2
14	Central Waitakere E/W_WB	KAURILANDS ROAD	10235680	417	197	-220	**12.6**	541	213	-328	**16.9**
		Central Waitakere E/W_WB - - Total		5080	5142	62	0.9	5873	5525	-348	4.6

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				Obs	Mod	Diff	GEH	Obs	Mod	Diff	GEH
15	Central Waitakere E/W 2_EB	ASH STREET	10250856	1811	2074	263	6.0	1599	1801	202	4.9
15	Central Waitakere E/W 2_EB	GREAT NORTH ROAD	10262678	1065	628	-437	**15.0**	902	634	-268	9.7
15	Central Waitakere E/W 2_EB	NORTH-WESTERN MOTORWAY	10209937	5246	5578	332	4.5	4846	5326	480	6.7
15	Central Waitakere E/W 2_EB	WOLVERTON STREET	12251257	1496	1910	414	10.0	1178	1619	441	11.8
15	Central Waitakere E/W 2_EB	BOLTON STREET	10238601	1061	873	-188	6.0	789	747	-42	1.5
15	Central Waitakere E/W 2_EB	KINROSS STREET	10235459	1025	1099	74	2.3	769	1320	551	**17.0**
15	Central Waitakere E/W 2_EB	CONNAUGHT STREET	10617780	234	182	-52	3.6	120	133	13	1.2
		Central Waitakere E/W 2_EB - - Total		11938	12344	406	3.7	10203	11580	1377	**13.2**
15	Central Waitakere E/W 2_WB	ASH STREET	12198241	698	708	10	0.4	924	717	-207	7.2
15	Central Waitakere E/W 2_WB	GREAT NORTH ROAD	10251825	388	584	196	8.9	658	681	23	0.9
15	Central Waitakere E/W 2_WB	CLARK STREET	10233603	863	940	77	2.6	1165	1047	-118	3.5
15	Central Waitakere E/W 2_WB	NORTH-WESTERN MOTORWAY	10210105	2664	2214	-450	9.1	2622	2482	-140	2.8
15	Central Waitakere E/W 2_WB	BOLTON STREET	10236510	258	392	134	7.4	478	428	-50	2.3
15	Central Waitakere E/W 2_WB	KINROSS STREET	10233123	258	355	97	5.5	413	412	-1	0.0
15	Central Waitakere E/W 2_WB	CONNAUGHT STREET	10233892	34	65	31	4.4	50	74	24	3.0
		Central Waitakere E/W 2_WB - - Total		5163	5258	95	1.3	6310	5841	-469	6.0
17	CBD_In	FANSHAWE STREET OFF RAMP	10275087	1381	1828	447	11.2	1733	1417	-316	8.0
17	CBD_In	COLLEGE HILL	10279313	778	987	209	7.0	964	741	-223	7.6
17	CBD_In	FRANKLIN ROAD	10279045	759	711	-48	1.8	914	780	-134	4.6
17	CBD_In	COOK STREET OFF RAMP	10278930	759	1094	335	11.0	977	1104	127	3.9
17	CBD_In	WELLINGTON STREET	10278007	389	314	-75	4.0	414	335	-79	4.1
17	CBD_In	NELSON STREET OFF RAMP	10277538	415	863	448	**17.7**	486	775	289	11.5
17	CBD_In	NELSON STREET OFF RAMP	10277536	1011	955	-56	1.8	902	858	-44	1.5
17	CBD_In	NELSON STREET OFF RAMP	10277511	954	1293	339	10.1	1145	1106	-39	1.2
17	CBD_In	HOPETOUN STREET	10276833	776	567	-209	8.1	955	515	-440	**16.2**
17	CBD_In	KARANGAHAPE ROAD	10276583	623	550	-73	3.0	746	483	-263	10.6
17	CBD_In	UPPER QUEEN STREET	10276516	1045	957	-88	2.8	1385	1038	-347	10.0
17	CBD_In	SYMONDS STREET	10258696	1148	875	-273	8.6	1042	964	-78	2.5
17	CBD_In	GRAFTON BRIDGE	10275209	101	85	-16	1.7	136	110	-26	2.3
17	CBD_In	WELLESLEY STREET EAST	10273821	916	1251	335	10.2	1275	1471	196	5.3
17	CBD_In	GRAFTON ROAD	10275248	259	116	-143	10.4	420	142	-278	**16.6**
17	CBD_In	ALTEN ROAD	10277694	446	485	39	1.8	518	555	37	1.6
17	CBD_In	BEACH ROAD	10274031	1123	748	-375	12.3	835	746	-89	3.2
17	CBD_In	QUAY STREET	10273873	1450	1743	293	7.3	1571	1638	67	1.7
		CBD_In - - Total		14333	15422	1089	8.9	16418	14778	-1640	**13.1**
17	CBD_Out	FANSHAWE STREET ON RAMP	10281312	579	552	-27	1.1	747	581	-166	6.4
17	CBD_Out	COLLEGE HILL	10279309	402	379	-23	1.2	584	438	-146	6.5
17	CBD_Out	FRANKLIN ROAD	10279056	365	369	4	0.2	489	377	-112	5.4
17	CBD_Out	WELLINGTON STREET	10277993	848	1398	550	**16.4**	920	1227	307	9.4
17	CBD_Out		10277073	1152	1358	206	5.8	1084	1200	116	3.4
17	CBD_Out	HOBSON STREET ON RAMP	10277067	469	525	56	2.5	543	485	-58	2.6

SL	Location	Road Section	Section ID	07:00 AM - 08:00 AM				08:00 AM - 09:00 AM			
				Obs	Mod	Diff	GEH	Obs	Mod	Diff	GEH
17	CBD_Out	HOPETOUN STREET	10277258	192	294	102	6.5	284	253	-31	1.9
17	CBD_Out	KARANGAHAPE ROAD	10276594	413	327	-86	4.5	498	269	-229	11.7
17	CBD_Out	UPPER QUEEN STREET	10251439	244	216	-28	1.8	360	269	-91	5.1
17	CBD_Out	SYMONDS STREET	10283030	415	510	95	4.4	668	371	-297	**13.0**
17	CBD_Out	SYMONDS STREET ON RAMP	10276178	336	381	45	2.4	378	352	-26	1.4
17	CBD_Out	GRAFTON BRIDGE	10275204	95	152	57	5.1	115	168	53	4.5
17	CBD_Out	WELLESLEY STREET EAST	10273819	212	313	101	6.2	279	298	19	1.1
17	CBD_Out	GRAFTON ROAD	10275244	209	303	94	5.9	339	328	-11	0.6
17	CBD_Out	ALTEN ROAD	10277690	476	605	129	5.5	566	594	28	1.2
17	CBD_Out	BEACH ROAD	10274044	668	425	-243	10.4	512	467	-45	2.0
17	CBD_Out	QUAY STREET	10273882	552	499	-53	2.3	702	487	-215	8.8
		CBD_Out - - Total		7627	8606	979	10.9	9068	8164	-904	9.7
19	Isthmus_In	MEOLA ROAD	10263753	937	821	-116	3.9	839	737	-102	3.6
19	Isthmus_In	GREAT NORTH ROAD	10254351	1403	1230	-173	4.8	1530	1016	-514	**14.4**
19	Isthmus_In	NORTH-WESTERN MOTORWAY	10261992	4957	5612	655	9.0	4948	5651	703	9.7
19	Isthmus_In	ST LUKES ROAD	10254131	1380	1313	-67	1.8	1236	1156	-80	2.3
19	Isthmus_In	NEW NORTH ROAD	10262429	1168	1039	-129	3.9	1102	1087	-15	0.5
19	Isthmus_In	NEW NORTH ROAD	10257494	1168	1041	-127	3.8	1102	1087	-15	0.5
19	Isthmus_In	SAINSBURY ROAD	10253683	131	145	14	1.2	224	212	-12	0.8
19	Isthmus_In	MORNINGSIDE DRIVE	10262255	327	446	119	6.1	634	476	-158	6.7
19	Isthmus_In	SANDRINGHAM ROAD	10251750	999	909	-90	2.9	751	1049	298	9.9
19	Isthmus_In	GORING ROAD	10261627	78	66	-12	1.4	127	36	-91	10.1
19	Isthmus_In	ELDON ROAD	10250883	165	170	5	0.4	301	147	-154	10.3
19	Isthmus_In	DOMINION ROAD	10264465	857	1014	157	5.1	524	934	410	**15.2**
19	Isthmus_In	HENLEY ROAD	10258458	369	96	-273	**17.9**	600	79	-521	**28.3**
19	Isthmus_In	MOUNT EDEN ROAD	10264426	1074	1113	39	1.2	686	1109	423	**14.1**
19	Isthmus_In	ST ANDREWS ROAD	10261775	614	825	211	7.9	456	746	290	11.8
19	Isthmus_In	THE DRIVE	10257543	512	388	-124	5.8	488	364	-124	6.0
19	Isthmus_In	MANUKAU ROAD	10258651	1432	1195	-237	6.5	1406	1136	-270	7.6
19	Isthmus_In	GREEN LANE EAST ON RAMP	10355822	917	1112	195	6.1	1047	1029	-18	0.6
19	Isthmus_In	SOUTHERN MOTORWAY	10291652	4482	4874	392	5.7	4444	4569	125	1.9
19	Isthmus_In	WHETURANGI ROAD	10251227	230	67	-163	**13.4**	358	120	-238	**15.4**
19	Isthmus_In	PURIRI DRIVE	10251181	230	58	-172	**14.3**	358	14	-344	**25.2**
19	Isthmus_In	GREAT SOUTH ROAD	10266128	825	874	49	1.7	834	1121	287	9.2
19	Isthmus_In	ASCOT AVENUE	10291420	252	464	212	11.2	260	453	193	10.2
19	Isthmus_In	REMUERA ROAD	10291456	1282	781	-501	**15.6**	1131	759	-372	12.1
19	Isthmus_In	ORAKEI ROAD	10288937	861	1186	325	10.2	726	1058	332	11.1
19	Isthmus_In	TAMAKI DRIVE	10285023	2542	2760	218	4.2	2793	2313	-480	9.5
19	Isthmus_In	UPLAND ROAD	10290963	211	265	54	3.5	256	274	18	1.1
19	Isthmus_In	LUCERNE ROAD	10290985	570	484	-86	3.7	430	563	133	6.0
		Isthmus_In - - Total		29973	30348	375	2.2	29591	29295	-296	1.7
19	Isthmus_Out	MEOLA ROAD	10263582	259	233	-26	1.7	357	261	-96	5.5

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19	Isthmus_Out	GREAT NORTH ROAD	10259241	319	292	-27	1.5	454	338	-116	5.8
19	Isthmus_Out	NORTH-WESTERN MOTORWAY	10255413	2614	2435	-179	3.6	2340	2456	116	2.4
19	Isthmus_Out	NEW NORTH ROAD	10262643	199	204	5	0.4	282	154	-128	8.7
19	Isthmus_Out	ST LUKES ROAD	10254129	893	963	70	2.3	1072	940	-132	4.2
19	Isthmus_Out	NEW NORTH ROAD	10257498	199	204	5	0.4	282	154	-128	8.7
19	Isthmus_Out	SAINSBURY ROAD	10265925	111	183	72	5.9	192	213	21	1.5
19	Isthmus_Out	MORNINGSIDE DRIVE	10259357	152	206	54	4.0	325	243	-82	4.9
19	Isthmus_Out	SANDRINGHAM ROAD	10254260	496	247	-249	**12.9**	619	275	-344	**16.3**
19	Isthmus_Out	GORING ROAD	10265208	38	86	48	6.1	31	88	57	7.4
19	Isthmus_Out	ELDON ROAD	10250875	71	61	-10	1.2	140	69	-71	6.9
19	Isthmus_Out	DOMINION ROAD	10261349	522	633	111	4.6	573	572	-1	0.0
19	Isthmus_Out	HENLEY ROAD	10256312	72	71	-1	0.1	92	95	3	0.3
19	Isthmus_Out	MOUNT EDEN ROAD	10252818	396	377	-19	1.0	404	473	69	3.3
19	Isthmus_Out	ST ANDREWS ROAD	10261770	207	120	-87	6.8	302	131	-171	11.6
19	Isthmus_Out	THE DRIVE	10252287	218	217	-1	0.1	336	252	-84	4.9
19	Isthmus_Out		10257382	778	842	64	2.2	831	848	17	0.6
19	Isthmus_Out	SOUTHERN MOTORWAY	10291690	5275	4693	-582	8.2	5049	4984	-65	0.9
19	Isthmus_Out	GREEN LANE EAST OFF RAMP	10291632	1062	1171	109	3.3	1047	1150	103	3.1
19	Isthmus_Out	WHETURANGI ROAD	10254317	120	133	13	1.2	191	141	-50	3.9
19	Isthmus_Out	PURIRI DRIVE	10251192	98	27	-71	9.0	189	37	-152	**14.3**
19	Isthmus_Out	GREAT SOUTH ROAD	10261861	657	562	-95	3.8	929	660	-269	9.5
19	Isthmus_Out	CLONBERN ROAD	10291641	45	91	46	5.6	79	69	-10	1.2
19	Isthmus_Out	ASCOT AVENUE	10291413	441	595	154	6.8	381	481	100	4.8
19	Isthmus_Out	REMUERA ROAD	10291460	301	370	69	3.8	521	357	-164	7.8
19	Isthmus_Out	ORAKEI ROAD	10288938	749	862	113	4.0	807	915	108	3.7
19	Isthmus_Out	TAMAKI DRIVE	10285025	576	757	181	7.0	510	809	299	11.6
19	Isthmus_Out	LUCERNE ROAD	10290984	120	164	44	3.7	211	297	86	5.4
19	Isthmus_Out	UPLAND ROAD	10290958	164	189	25	1.9	174	182	8	0.6
		Isthmus_Out - - Total		17152	16988	-164	1.3	18720	17644	-1076	8.0
21	Manukau Harbour_NB	SOUTH-WESTERN MOTORWAY	10316384	4573	4462	-111	1.7	4166	4637	471	7.1
21	Manukau Harbour_NB	RIMU ROAD ON RAMP	10318193	1153	1105	-48	1.4	1035	1044	9	0.3
21	Manukau Harbour_NB	SALEYARDS ROAD	12198298	909	1081	172	5.5	903	1060	157	5.0
21	Manukau Harbour_NB	GREAT SOUTH ROAD	12198304	976	583	-393	**14.1**	794	428	-366	**14.8**
21	Manukau Harbour_NB	ATKINSON AVENUE	10319731	1429	1513	84	2.2	1385	1391	6	0.2
21	Manukau Harbour_NB	SOUTHERN MOTORWAY	10295690	3112	4414	1302	**21.2**	2608	4453	1845	**31.1**
21	Manukau Harbour_NB	PAKURANGA HIGHWAY	10293877	3624	3368	-256	4.3	3466	3233	-233	4.0
21	Manukau Harbour_NB	LAGOON DRIVE	10293857	2535	1780	-755	**16.3**	2332	1999	-333	7.2
		Manukau Harbour_NB - - Total		18311	18306	-5	0.0	16689	18245	1556	11.8
21	Manukau Harbour_SB	SOUTH-WESTERN MOTORWAY	10262955	4494	4246	-248	3.8	4353	4581	228	3.4
21	Manukau Harbour_SB	GLOUCESTER PARK ROAD	10264406	1263	1220	-43	1.2	1177	1236	59	1.7
21	Manukau Harbour_SB	SALEYARDS ROAD	10320263	512	245	-267	**13.7**	494	265	-229	11.8
21	Manukau Harbour_SB	GREAT SOUTH ROAD	10319727	327	163	-164	10.5	343	161	-182	11.5

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21	Manukau Harbour_SB	ATKINSON AVENUE	10319775	517	568	51	2.2	576	477	-99	4.3
21	Manukau Harbour_SB	SOUTHERN MOTORWAY	10295733	4888	4871	-17	0.2	4494	4749	255	3.8
21	Manukau Harbour_SB	PAKURANGA HIGHWAY	10293878	1097	940	-157	4.9	1202	1252	50	1.4
21	Manukau Harbour_SB	LAGOON DRIVE	10293870	764	640	-124	4.7	1010	604	-406	**14.3**
		Manukau Harbour_SB - - Total		13862	12893	-969	8.4	13649	13325	-324	2.8
22	Ti Rakau Dr_NB	TRUGOOD DRIVE	10299344	311	505	194	9.6	308	268	-40	2.4
22	Ti Rakau Dr_NB	HARRIS ROAD	10300473	681	667	-14	0.5	820	618	-202	7.5
22	Ti Rakau Dr_NB	GREENMOUNT DRIVE	10300632	112	98	-14	1.4	138	144	6	0.5
22	Ti Rakau Dr_NB	HUNTINGTON DRIVE	10300192	136	121	-15	1.3	147	133	-14	1.2
22	Ti Rakau Dr_NB	TE KOHA ROAD	10300295	132	94	-38	3.6	195	78	-117	10.0
22	Ti Rakau Dr_NB	TE KOHA ROAD	10300297	10	12	2	0.6	25	8	-17	4.2
22	Ti Rakau Dr_NB	TE IRIRANGI DRIVE	10300014	171	152	-19	1.5	115	70	-45	4.7
22	Ti Rakau Dr_NB	TE IRIRANGI DRIVE	10300016	494	639	145	6.1	826	735	-91	3.3
22	Ti Rakau Dr_NB	CHAPEL ROAD	10298408	292	252	-40	2.4	324	288	-36	2.1
22	Ti Rakau Dr_NB	CHAPEL ROAD	10298406	234	397	163	9.2	523	388	-135	6.3
22	Ti Rakau Dr_NB	KILKENNY DRIVE	12047577	259	213	-46	3.0	535	234	-301	**15.4**
22	Ti Rakau Dr_NB	POINT VIEW DRIVE	10300109	37	32	-5	0.9	113	45	-68	7.7
		Ti Rakau Dr_NB - - Total		2869	3182	313	5.7	4069	3009	-1060	**17.8**
22	Ti Rakau Dr_SB	TRUGOOD DRIVE	10299337	430	251	-179	9.7	399	117	-282	**17.6**
22	Ti Rakau Dr_SB	HARRIS ROAD	10300470	1859	1578	-281	6.8	1863	1205	-658	**16.8**
22	Ti Rakau Dr_SB	GREENMOUNT DRIVE	10300629	317	691	374	**16.7**	342	697	355	**15.6**
22	Ti Rakau Dr_SB	HUNTINGTON DRIVE	10300188	34	77	43	5.8	42	82	40	5.1
22	Ti Rakau Dr_SB	TE KOHA ROAD	10300306	61	23	-38	5.9	103	43	-60	7.0
22	Ti Rakau Dr_SB	TE IRIRANGI DRIVE	10300008	1657	1998	341	8.0	1640	1888	248	5.9
22	Ti Rakau Dr_SB	CHAPEL ROAD	10298387	824	814	-10	0.3	1113	711	-402	**13.3**
22	Ti Rakau Dr_SB	KILKENNY DRIVE	12047565	236	453	217	11.7	430	417	-13	0.6
22	Ti Rakau Dr_SB	POINT VIEW DRIVE	10298103	131	140	9	0.8	194	115	-79	6.4
		Ti Rakau Dr_SB - - Total		5549	6025	476	6.3	6126	5275	-851	11.3
23	East Tamaki_In	EAST TAMAKI ROAD	10302595	1093	1235	142	4.2	1231	1264	33	0.9
23	East Tamaki_In	HIGHBROOK DRIVE	10301445	2347	2255	-92	1.9	2247	1955	-292	6.4
		East Tamaki_In - - Total		3440	3490	50	0.8	3478	3219	-259	4.5
23	East Tamaki_Out	EAST TAMAKI ROAD	10304313	1364	1499	135	3.6	1499	1582	83	2.1
23	East Tamaki_Out	HIGHBROOK DRIVE	10301436	1586	876	-710	**20.2**	1319	530	-789	**25.9**
		East Tamaki_Out - - Total		2950	2375	-575	11.1	2818	2112	-706	**14.2**
24	Airport_In	SOUTH-WESTERN MOTORWAY	10316944	2107	1770	-337	7.7	1921	2110	189	4.2
24	Airport_In	IDLEWILD AVENUE	10316961	282	229	-53	3.3	396	252	-144	8.0
24	Airport_In	KIRKBRIDE ROAD	10316977	421	417	-4	0.2	557	384	-173	8.0
24	Airport_In	GREENWOOD ROAD	10317353	287	311	24	1.4	421	282	-139	7.4
24	Airport_In	PUHINUI ROAD	10322951	1406	1265	-141	3.9	1296	1280	-16	0.4

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24	Airport_In	KIRKBRIDE ROAD	10317910	900	859	-41	1.4	1001	737	-264	9.0
24	Airport_In	SOUTH-WESTERN MOTORWAY	10317080	446	655	209	8.9	571	565	-6	0.3
		Airport_In - - Total		5849	5506	-343	4.6	6163	5610	-553	7.2
24	Airport_Out	BADER DRIVE OFF RAMP	10317044	44	137	93	9.8	55	117	62	6.7
24	Airport_Out	SOUTH-WESTERN MOTORWAY	10316782	712	919	207	7.2	874	988	114	3.7
24	Airport_Out	IDLEWILD AVENUE	10316963	171	126	-45	3.7	253	106	-147	11.0
24	Airport_Out	KIRKBRIDE ROAD	10316980	255	191	-64	4.3	348	220	-128	7.6
24	Airport_Out	GREENWOOD ROAD	10317348	94	193	99	8.3	76	206	130	10.9
24	Airport_Out	PUHINUI ROAD	12198331	432	564	132	5.9	566	706	140	5.6
24	Airport_Out	KIRKBRIDE ROAD	10317908	407	471	64	3.1	568	377	-191	8.8
		Airport_Out - - Total		2115	2601	486	10.0	2740	2720	-20	0.4
26	Manukau Sth_NB	SOUTHERN MOTORWAY	10333505	5728	5402	-326	4.4	5433	5290	-143	2.0
26	Manukau Sth_NB	ORAMS ROAD	10333461	518	571	53	2.3	436	485	49	2.3
26	Manukau Sth_NB	REDOUBT ROAD	10306506	1355	1504	149	3.9	1043	1382	339	9.7
26	Manukau Sth_NB	ROSCOMMON ROAD	12198358	2045	1726	-319	7.3	1605	1516	-89	2.3
26	Manukau Sth_NB	DALGETY DRIVE	10332646	791	989	198	6.6	785	997	212	7.1
26	Manukau Sth_NB	GREAT SOUTH ROAD	12198364	1530	1653	123	3.1	1306	1552	246	6.5
		Manukau Sth_NB - - Total		11967	11845	-122	1.1	10608	11222	614	5.9
26	Manukau Sth_SB	SOUTHERN MOTORWAY	10333509	3575	2871	-704	12.4	3402	3277	-125	2.2
26	Manukau Sth_SB	EUGENIA RISE	12251269	377	219	-158	9.2	512	270	-242	12.2
26	Manukau Sth_SB	REDOUBT ROAD	10306507	356	619	263	11.9	437	738	301	12.4
26	Manukau Sth_SB	ROSCOMMON ROAD	10321462	686	695	9	0.3	769	742	-27	1.0
26	Manukau Sth_SB	DALGETY DRIVE	10313555	294	289	-5	0.3	387	320	-67	3.6
26	Manukau Sth_SB	GREAT SOUTH ROAD	10332713	420	403	-17	0.8	581	422	-159	7.1
		Manukau Sth_SB - - Total		5708	5096	-612	8.3	6088	5769	-319	4.1
27	Southern E/W_EB	IAN MCKINNON DRIVE	10251941	933	1002	69	2.2	1234	1107	-127	3.7
27	Southern E/W_EB	UPPER QUEEN STREET	10256997	141	122	-19	1.7	231	90	-141	11.1
27	Southern E/W_EB	ST BENEDICTS STREET	10255798	44	53	9	1.3	60	70	10	1.2
27	Southern E/W_EB	SYMONDS STREET	10258401	682	446	-236	9.9	720	559	-161	6.4
27	Southern E/W_EB	GRAFTON ROAD	10258959	653	714	61	2.3	718	829	111	4.0
27	Southern E/W_EB	KHYBER PASS ROAD	10289511	842	917	75	2.5	937	946	9	0.3
27	Southern E/W_EB	BOSTON ROAD	10254415	422	412	-10	0.5	465	329	-136	6.8
27	Southern E/W_EB	MOUNTAIN ROAD	10257852	671	727	56	2.1	911	669	-242	8.6
27	Southern E/W_EB	ALMORAH ROAD	10260103	8	25	17	4.2	12	18	6	1.5
27	Southern E/W_EB	GILLIES AVENUE	10290158	1466	1478	12	0.3	1394	1195	-199	5.5
27	Southern E/W_EB	BROADWAY	10290336	893	788	-105	3.6	1034	898	-136	4.4
27	Southern E/W_EB	ST MARKS ROAD	12198244	530	365	-165	7.8	540	228	-312	**15.9**
27	Southern E/W_EB	MAURANUI AVENUE	10290621	198	242	44	3.0	289	226	-63	3.9
27	Southern E/W_EB	MARKET ROAD	10290928	369	365	-4	0.2	406	354	-52	2.7
27	Southern E/W_EB	OMAHU ROAD	10255827	250	291	41	2.5	312	424	112	5.8

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27	Southern E/W_EB	GREEN LANE EAST	10254674	1504	1316	-188	5.0	1548	1405	-143	3.7
27	Southern E/W_EB		12262428	96	50	-46	5.4	139	30	-109	11.9
27	Southern E/W_EB	WALPOLE STREET	12262438	243	55	-188	**15.4**	384	67	-317	**21.1**
27	Southern E/W_EB	MAIN HIGHWAY	10261321	409	771	362	**14.9**	602	744	142	5.5
27	Southern E/W_EB	ELLERSLIE-PANMURE HIGHWAY	10264918	747	1018	271	9.1	671	1195	524	**17.2**
27	Southern E/W_EB	PENROSE ROAD	12198283	577	778	201	7.7	727	724	-3	0.1
27	Southern E/W_EB	SOUTH-EASTERN HWY ON RAMP	10294863	218	75	-143	11.8	202	46	-156	**14.0**
27	Southern E/W_EB	SOUTH-EASTERN HWY ON RAMP	10294865	231	185	-46	3.2	163	199	36	2.7
27	Southern E/W_EB	SOUTH-EASTERN HIGHWAY	10294860	703	685	-18	0.7	734	675	-59	2.2
27	Southern E/W_EB	MOUNT WELLINGTON HWY ON RAMP	10295059	539	762	223	8.7	458	718	260	10.7
27	Southern E/W_EB	MOUNT WELLINGTON HIGHWAY	10295056	947	811	-136	4.6	1121	755	-366	12.0
27	Southern E/W_EB	CLEMOW DRIVE	10318331	474	827	353	**13.8**	434	907	473	**18.3**
27	Southern E/W_EB	PANAMA ROAD	10320164	492	480	-12	0.5	494	448	-46	2.1
27	Southern E/W_EB	EAST TAMAKI ROAD	10314455	1110	1044	-66	2.0	1238	1184	-54	1.6
27	Southern E/W_EB	TRENWITH STREET	10321374	167	424	257	**15.0**	217	454	237	**12.9**
27	Southern E/W_EB	PRINCES STREET	10295946	452	312	-140	7.2	465	397	-68	3.3
27	Southern E/W_EB	BAIRDS ROAD	10303216	891	753	-138	4.8	873	755	-118	4.1
27	Southern E/W_EB	REAGAN ROAD	10313223	744	838	94	3.3	840	534	-306	11.7
27	Southern E/W_EB	TE IRIRANGI DRIVE	10313164	656	696	40	1.5	877	978	101	3.3
27	Southern E/W_EB	REDOUBT ROAD ON RAMP	10312777	283	535	252	12.5	289	536	247	12.2
27	Southern E/W_EB	REDOUBT ROAD	10312732	656	625	-31	1.2	818	763	-55	2.0
27	Southern E/W_EB	SOUTH-WESTERN MOTORWAY	10312950	460	450	-10	0.5	526	514	-12	0.5
27	Southern E/W_EB	SOUTH-WESTERN MOTORWAY	10356049	1156	1079	-77	2.3	1185	1281	96	2.7
27	Southern E/W_EB	ORAMS ROAD	12251266	518	569	51	2.2	436	484	48	2.2
27	Southern E/W_EB	GRANDE VUE ROAD	10338641	389	342	-47	2.5	291	332	41	2.3
27	Southern E/W_EB	HILL ROAD	10338152	423	328	-95	4.9	499	308	-191	9.5
27	Southern E/W_EB	ALFRISTON ROAD	10332762	331	322	-9	0.5	490	361	-129	6.3
		Southern E/W_EB - - Total		23518	24077	559	3.6	25984	24736	-1248	7.8
27	Southern E/W_WB	IAN MCKINNON DRIVE	10259505	200	202	2	0.1	289	225	-64	4.0
27	Southern E/W_WB	UPPER QUEEN STREET	10253558	104	78	-26	2.7	144	62	-82	8.1
27	Southern E/W_WB	ST BENEDICTS STREET	10255792	48	132	84	8.9	80	121	41	4.1
27	Southern E/W_WB	SYMONDS STREET	10256210	400	483	83	4.0	581	343	-238	11.1
27	Southern E/W_WB	GRAFTON ROAD	10257148	515	574	59	2.5	646	649	3	0.1
27	Southern E/W_WB	KHYBER PASS ROAD	10253420	1125	998	-127	3.9	1234	752	-482	**15.3**
27	Southern E/W_WB	BOSTON ROAD	10266721	200	331	131	8.0	207	368	161	9.5
27	Southern E/W_WB	MOUNTAIN ROAD	10289456	373	371	-2	0.1	491	373	-118	5.7
27	Southern E/W_WB	MAUNGAWHAU ROAD	10296650	15	61	46	7.5	22	52	30	4.9
27	Southern E/W_WB	GILLIES AVENUE	10290136	871	1075	204	6.5	838	1035	197	6.4
27	Southern E/W_WB	BROADWAY	10290116	527	431	-96	4.4	600	408	-192	8.6
27	Southern E/W_WB	ST MARKS ROAD	10290617	499	398	-101	4.8	816	335	-481	**20.1**
27	Southern E/W_WB	MAURANUI AVENUE	10259356	80	63	-17	2.0	100	88	-12	1.2
27	Southern E/W_WB	MARKET ROAD	10290862	882	550	-332	12.4	856	607	-249	9.2
27	Southern E/W_WB	OMAHU ROAD	10290896	356	367	11	0.6	432	364	-68	3.4

SL	Location	Road Section	Section ID	07:00 AM - 08:00 AM				08:00 AM - 09:00 AM			
				Obs	Mod	Diff	GEH	Obs	Mod	Diff	GEH
27	Southern E/W_WB	GREEN LANE EAST	10254443	1312	1469	157	4.2	1431	1447	16	0.4
27	Southern E/W_WB		12198265	445	64	-381	**23.9**	474	45	-429	**26.6**
27	Southern E/W_WB	MITCHELSON STREET	12198259	158	6	-152	**16.8**	285	8	-277	**22.9**
27	Southern E/W_WB	MAIN HIGHWAY	12198271	978	1310	332	9.8	1079	1176	97	2.9
27	Southern E/W_WB	ELLERSLIE-PANMURE HIGHWAY	12198277	1149	1573	424	11.5	1158	1502	344	9.4
27	Southern E/W_WB	PENROSE ROAD	12198286	1455	1429	-26	0.7	1538	1185	-353	9.6
27	Southern E/W_WB	SOUTH-EASTERN HIGHWAY	10296707	1787	1697	-90	2.2	1648	1619	-29	0.7
27	Southern E/W_WB	MOUNT WELLINGTON HIGHWAY	10295067	1318	2086	768	**18.6**	1544	1940	396	9.5
27	Southern E/W_WB	CLEMOW DRIVE	10295710	614	666	52	2.1	666	602	-64	2.5
27	Southern E/W_WB	PANAMA ROAD	10295864	463	365	-98	4.8	505	268	-237	12.1
27	Southern E/W_WB	PRINCES STREET	10319933	1330	1224	-106	3.0	1214	1108	-106	3.1
27	Southern E/W_WB	TRENWITH STREET	10295991	306	143	-163	10.9	235	169	-66	4.6
27	Southern E/W_WB	BAIRDS ROAD	10303220	990	978	-12	0.4	1005	1047	42	1.3
27	Southern E/W_WB	EAST TAMAKI ROAD	10314463	874	866	-8	0.3	1142	1008	-134	4.1
27	Southern E/W_WB	REAGAN ROAD	12198340	999	1275	276	8.2	1112	1413	301	8.5
27	Southern E/W_WB	TE IRIRANGI DRIVE	12198346	2161	1783	-378	8.5	2420	1623	-797	**17.7**
27	Southern E/W_WB	REDOUBT ROAD	12198352	1248	615	-633	**20.7**	1301	615	-686	**22.2**
27	Southern E/W_WB	AIRPORT OFF RAMP	10312901	2468	1895	-573	12.3	2237	1878	-359	7.9
27	Southern E/W_WB	SOUTH-WESTERN MOTORWAY	10312924	1085	1988	903	**23.0**	1159	2150	991	**24.4**
27	Southern E/W_WB	GREAT SOUTH ROAD OFF RAMP	12198355	553	369	-184	8.6	781	323	-458	**19.5**
27	Southern E/W_WB	EUGENIA RISE	10306639	377	220	-157	9.1	512	270	-242	12.2
27	Southern E/W_WB	GRANDE VUE ROAD	10338198	108	45	-63	7.2	156	68	-88	8.3
27	Southern E/W_WB	HILL ROAD	10338155	318	183	-135	8.5	391	170	-221	**13.2**
27	Southern E/W_WB	ALFRISTON ROAD	10332770	1237	1519	282	7.6	1186	1418	232	6.4
		Southern E/W_WB - - Total		29928	29882	-46	0.3	32515	28834	-3681	**21.0**
28	Takanini_South_NB	GREAT SOUTH ROAD	10337904	1021	759	-262	8.8	1067	768	-299	9.9
28	Takanini_South_NB	MANUREWA-TAKANINI ON RAMP	10337855	1059	1028	-31	1.0	989	1028	39	1.2
28	Takanini_South_NB	SOUTHERN MOTORWAY	10337827	3004	2912	-92	1.7	3107	2916	-191	3.5
28	Takanini_South_NB	PORCHESTER ROAD	10336541	1006	1220	214	6.4	833	910	77	2.6
28	Takanini_South_NB	MILL ROAD	10336191	980	580	-400	**14.3**	795	490	-305	12.0
		Takanini_South_NB - - Total		7070	6499	-571	6.9	6791	6112	-679	8.5
28	Takanini_South_SB	SOUTHERN MOTORWAY	10337923	2892	2174	-718	**14.3**	2696	2566	-130	2.5
28	Takanini_South_SB	MILL ROAD	10336193	393	747	354	**14.8**	434	707	273	11.4
28	Takanini_South_SB	GREAT SOUTH ROAD	12198373	1211	1236	25	0.7	1250	1118	-132	3.8
28	Takanini_South_SB	PORCHESTER ROAD	12198379	317	333	16	0.9	429	367	-62	3.1
		Takanini_South_SB - - Total		4813	4490	-323	4.7	4809	4758	-51	0.7
29	Rural SE_EB	WHITFORD ROAD	10298114	316	473	157	7.9	314	613	299	**13.9**
29	Rural SE_EB	SANDSTONE ROAD	10334490	185	235	50	3.5	200	325	125	7.7
29	Rural SE_EB	ALFRISTON ROAD	10333809	268	351	83	4.7	215	459	244	**13.3**
29	Rural SE_EB	CLEVEDON-TAKANINI ROAD	10333728	53	116	63	6.9	71	175	104	9.4
29	Rural SE_EB	PAPAKURA-CLEVEDON ROAD	25786	159	184	25	1.9	144	204	60	4.5

SL	Location	Road Section	Section ID	07:00 AM - 08:00 AM				08:00 AM - 09:00 AM			
				Obs	Mod	Diff	GEH	Obs	Mod	Diff	GEH
		Rural SE_EB - - Total		981	1359	378	11.1	944	1776	832	**22.6**
29	Rural SE_WB	WHITFORD ROAD	12198328	721	669	-52	2.0	658	784	126	4.7
29	Rural SE_WB	SANDSTONE ROAD	10334491	727	806	79	2.9	560	972	412	**14.9**
29	Rural SE_WB	BROOKBY ROAD	10333516	296	348	52	2.9	220	337	117	7.0
29	Rural SE_WB	CLEVEDON-TAKANINI ROAD	10333742	158	251	93	6.5	131	184	53	4.2
29	Rural SE_WB	PAPAKURA-CLEVEDON ROAD	25785	169	238	69	4.8	159	198	39	2.9
		Rural SE_WB - - Total		2071	2312	241	5.1	1728	2475	747	**16.3**
30	Takanini/Papakura/Drury_In	HUNUA ROAD	10328376	186	164	-22	1.7	175	165	-10	0.8
30	Takanini/Papakura/Drury_In	COAL MINE ROAD	10328528	147	61	-86	8.4	126	68	-58	5.9
30	Takanini/Papakura/Drury_In	WAIHOEHOE ROAD	10328739	253	255	2	0.1	243	212	-31	2.1
		Takanini/Papakura/Drury_In - - Total		586	480	-106	4.6	544	445	-99	4.5
30	Takanini/Papakura/Drury_Out	HUNUA ROAD	10328372	90	88	-2	0.2	88	109	21	2.1
30	Takanini/Papakura/Drury_Out	PONGA ROAD	10328534	22	28	6	1.2	42	41	-1	0.2
30	Takanini/Papakura/Drury_Out	WAIHOEHOE ROAD	10328760	96	98	2	0.2	121	127	6	0.5
		Takanini/Papakura/Drury_Out - - Total		208	214	6	0.4	251	277	26	1.6
31	Rural South_NB/EB	LINWOOD ROAD	10342125	1134	600	-534	**18.1**	821	685	-136	5.0
31	Rural South_NB/EB	SOUTHERN MOTORWAY	10328282	1725	2624	899	**19.3**	2009	2029	20	0.4
31	Rural South_NB/EB	GREAT SOUTH ROAD	10328690	450	413	-37	1.8	514	480	-34	1.5
		Rural South_NB/EB - - Total		3309	3637	328	5.6	3344	3194	-150	2.6
31	Rural South_SB/WB	HINGAIA ROAD	12047811	195	308	113	7.1	226	250	24	1.6
31	Rural South_SB/WB	SOUTHERN MOTORWAY	10328316	2012	1586	-426	10.0	1815	2134	319	7.2
31	Rural South_SB/WB	GREAT SOUTH ROAD	10328688	872	463	-409	**15.8**	698	527	-171	6.9
		Rural South_SB/WB - - Total		3079	2357	-722	**13.8**	2739	2911	172	3.2
32	Pukekohe_In	OSTRICH ROAD	10342706	49	58	9	1.2	37	93	56	6.9
32	Pukekohe_In	PAERATA ROAD	12047823	401	302	-99	5.3	620	352	-268	12.2
32	Pukekohe_In	CAPE HILL ROAD	10342532	121	170	49	4.1	92	188	96	8.1
32	Pukekohe_In	GOLDING ROAD	10345474	66	154	88	8.4	92	147	55	5.0
32	Pukekohe_In	BUCKLAND ROAD	10345361	307	372	65	3.5	429	393	-36	1.8
32	Pukekohe_In	PUKEKOHE EAST ROAD	21446342	584	476	-108	4.7	711	475	-236	9.7
		Pukekohe_In - - Total		1528	1532	4	0.1	1981	1648	-333	7.8
32	Pukekohe_Out	OSTRICH ROAD	10344422	116	170	54	4.5	83	137	54	5.1
32	Pukekohe_Out	PAERATA ROAD	10342394	821	549	-272	10.4	700	416	-284	12.0
32	Pukekohe_Out	CAPE HILL ROAD	10342533	56	273	217	**16.9**	86	190	104	8.9
32	Pukekohe_Out	GOLDING ROAD	10345371	49	91	42	5.0	66	66	0	0.0
32	Pukekohe_Out	BUCKLAND ROAD	10345133	164	188	24	1.8	259	220	-39	2.5
32	Pukekohe_Out	PUKEKOHE EAST ROAD	21446345	476	393	-83	4.0	514	344	-170	8.2
		Pukekohe_Out - - Total		1682	1664	-18	0.4	1708	1373	-335	8.5

SL	Location	Road Section	Section ID	07:00 AM - 08:00 AM				08:00 AM - 09:00 AM			
				Obs	Mod	Diff	GEH	Obs	Mod	Diff	GEH
33	Waitakeres_EB	BETHELLS ROAD	10215759	149	167	18	1.4	177	113	-64	5.3
33	Waitakeres_EB	SCENIC DRIVE NORTH	10243439	231	257	26	1.7	231	235	4	0.3
33	Waitakeres_EB	HENDERSON VALLEY ROAD	10239591	173	320	147	9.4	301	168	-133	8.7
33	Waitakeres_EB	FOREST HILL ROAD	10238929	146	194	48	3.7	160	204	44	3.3
33	Waitakeres_EB	WEST COAST ROAD	10238720	395	393	-2	0.1	555	354	-201	9.4
33	Waitakeres_EB	HOLDENS ROAD	21619209	17	0	-17	5.8	19	4	-15	4.4
33	Waitakeres_EB	SCENIC DRIVE	10239511	66	220	154	12.9	72	167	95	8.7
33	Waitakeres_EB	WOODLANDS PARK ROAD	10233435	102	235	133	10.2	188	220	32	2.2
33	Waitakeres_EB	HUIA ROAD	10242783	589	427	-162	7.2	472	317	-155	7.8
33	Waitakeres_EB	SOUTH TITIRANGI ROAD	10232927	180	204	24	1.7	208	160	-48	3.5
		Waitakeres_EB - - Total		2048	2417	369	7.8	2383	1942	-441	9.5
33	Waitakeres_WB	BETHELLS ROAD	10215423	30	50	20	3.2	48	74	26	3.3
33	Waitakeres_WB	SCENIC DRIVE NORTH	10243757	45	46	1	0.1	85	34	-51	6.6
33	Waitakeres_WB	HENDERSON VALLEY ROAD	10238116	64	128	64	6.5	238	87	-151	11.8
33	Waitakeres_WB	FOREST HILL ROAD	10617942	42	63	21	2.9	56	82	26	3.1
33	Waitakeres_WB	WEST COAST ROAD	10238725	139	209	70	5.3	296	215	-81	5.1
33	Waitakeres_WB	HOLDENS ROAD	21619210	10	2	-8	3.3	15	1	-14	4.9
33	Waitakeres_WB	SCENIC DRIVE	10236428	20	48	28	4.8	32	71	39	5.4
33	Waitakeres_WB	WOODLANDS PARK ROAD	10233439	51	112	61	6.8	194	121	-73	5.8
33	Waitakeres_WB	HUIA ROAD	10235086	95	141	46	4.2	233	122	-111	8.3
33	Waitakeres_WB	SOUTH TITIRANGI ROAD	10617738	44	56	12	1.7	61	75	14	1.7
		Waitakeres_WB - - Total		540	855	315	11.9	1258	882	-376	11.5

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SL	Location	Road Section	Section ID	11:00 AM - 12:00 PM Obs	Mod	Diff	GEH	12:00 PM - 01:00 PM Obs	Mod	Diff	GEH
1	Rural North_NB	NORTHERN GATEWAY TOLL ROAD	3227581	563	561	-2	0.1	539	525	-14	0.6
1	Rural North_NB	HIBISCUS COAST HIGHWAY	3256864	153	97	-56	5.0	164	83	-81	7.3
1	Rural North_NB	KAIPARA COAST HIGHWAY	3233089	122	195	73	5.8	128	211	83	6.4
		Rural North_NB - - Total		838	853	15	0.5	831	819	-12	0.4
1	Rural North_SB	NORTHERN GATEWAY TOLL ROAD	3231486	570	575	5	0.2	570	614	44	1.8
1	Rural North_SB	HIBISCUS COAST HIGHWAY	3256867	172	89	-83	7.3	149	98	-51	4.6
1	Rural North_SB	KAIPARA COAST HIGHWAY	3233094	119	241	122	9.1	124	206	82	6.4
		Rural North_SB - - Total		861	905	44	1.5	843	918	75	2.5
2	North Shore North_NB	DAIRY FLAT HIGHWAY	3222335	192	268	76	5.0	214	273	59	3.8
2	North Shore North_NB	POSTMAN ROAD	3217257	34	21	-13	2.5	37	41	4	0.6
2	North Shore North_NB	NORTHERN MOTORWAY	3220624	1379	1183	-196	5.5	1373	1112	-261	7.4
2	North Shore North_NB	OTEHA VALLEY ROAD ON RAMP	3221042	280	147	-133	9.1	349	126	-223	**14.5**
2	North Shore North_NB	EAST COAST ROAD	3255497	198	518	320	**16.9**	208	514	306	**16.1**
		North Shore North_NB - - Total		2083	2137	54	1.2	2181	2066	-115	2.5
2	North Shore North_SB	DAIRY FLAT HIGHWAY	3222437	205	255	50	3.3	193	250	57	3.8
2	North Shore North_SB	POSTMAN ROAD	3217251	34	25	-9	1.7	33	25	-8	1.5
2	North Shore North_SB	NORTHERN MOTORWAY	3229963	864	658	-206	7.5	838	737	-101	3.6
2	North Shore North_SB	SILVERDALE ON RAMP	3234539	996	571	-425	**15.2**	940	581	-359	**13.0**
2	North Shore North_SB	EAST COAST ROAD	3260165	207	701	494	**23.2**	218	766	548	**24.7**
		North Shore North_SB - - Total		2306	2210	-96	2.0	2222	2359	137	2.9
3	Whangaparaoa_EB	WHANGAPARAOA ROAD	3254798	733	915	182	6.3	821	806	-15	0.5
3	Whangaparaoa_EB	RED BEACH ROAD	3253562	458	358	-100	5.0	495	401	-94	4.4
		Whangaparaoa_EB - - Total		1191	1273	82	2.3	1316	1207	-109	3.1
3	Whangaparaoa_WB	WHANGAPARAOA ROAD	3252511	914	990	76	2.5	826	974	148	4.9
3	Whangaparaoa_WB	RED BEACH ROAD	3254015	445	349	-96	4.8	438	358	-80	4.0
		Whangaparaoa_WB - - Total		1359	1339	-20	0.5	1264	1332	68	1.9
4	Rural West_EB	OLD NORTH ROAD	10212500	115	164	49	4.1	106	183	77	6.4
4	Rural West_EB	SH 16	10222230	466	439	-27	1.3	447	388	-59	2.9
4	Rural West_EB	KAHIKATEA FLAT ROAD	3239532	151	220	69	5.1	162	198	36	2.7
		Rural West_EB - - Total		732	823	91	3.3	715	769	54	2.0
4	Rural West_WB	OLD NORTH ROAD	10210127	102	142	40	3.6	102	169	67	5.8
4	Rural West_WB	SH 16	10222317	430	431	1	0.0	451	383	-68	3.3
4	Rural West_WB	KAHIKATEA FLAT ROAD	3241427	146	219	73	5.4	168	217	49	3.5
		Rural West_WB - - Total		678	792	114	4.2	721	769	48	1.8

SL	Location	Road Section	Section ID	11:00 AM - 12:00 PM Obs	Mod	Diff	GEH	12:00 PM - 01:00 PM Obs	Mod	Diff	GEH
7	Upper_Harbour_N/S_NB	ALBANY HIGHWAY	3213039	737	885	148	5.2	825	823	-2	0.1
7	Upper_Harbour_N/S_NB	CARIBBEAN DRIVE	21172402	291	249	-42	2.6	292	259	-33	2.0
7	Upper_Harbour_N/S_NB	MEADOWOOD DRIVE	21172411	69	76	7	0.8	82	70	-12	1.4
7	Upper_Harbour_N/S_NB	NORTHERN MOTORWAY	10355027	3749	3630	-119	2.0	3976	3826	-150	2.4
7	Upper_Harbour_N/S_NB	PARKWAY DRIVE	5811768	280	415	135	7.2	286	358	72	4.0
7	Upper_Harbour_N/S_NB	PARKWAY DRIVE	21172430	93	212	119	9.6	117	205	88	6.9
7	Upper_Harbour_N/S_NB	EAST COAST ROAD	21172436	650	570	-80	3.2	727	544	-183	7.3
7	Upper_Harbour_N/S_NB	MATIPO ROAD	3253471	71	52	-19	2.4	74	32	-42	5.8
7	Upper_Harbour_N/S_NB	BEACH ROAD	21172442	261	284	23	1.4	312	309	-3	0.2
		Upper_Harbour_N/S_NB - - Total		6201	6373	172	2.2	6691	6426	-265	3.3
7	Upper_Harbour_N/S_SB	ALBANY HIGHWAY	5812239	721	889	168	5.9	721	869	148	5.2
7	Upper_Harbour_N/S_SB	CARIBBEAN DRIVE	21172405	297	168	-129	8.5	281	178	-103	6.8
7	Upper_Harbour_N/S_SB	MEADOWOOD DRIVE	21172414	81	66	-15	1.7	86	52	-34	4.1
7	Upper_Harbour_N/S_SB	NORTHERN MOTORWAY	10355030	4022	4016	-6	0.1	3936	4387	451	7.0
7	Upper_Harbour_N/S_SB	PARKWAY DRIVE	5811771	239	211	-28	1.9	227	268	41	2.6
7	Upper_Harbour_N/S_SB	PARKWAY DRIVE	21172433	158	246	88	6.2	190	212	22	1.6
7	Upper_Harbour_N/S_SB	EAST COAST ROAD	21172439	717	765	48	1.8	791	717	-74	2.7
7	Upper_Harbour_N/S_SB	MATIPO ROAD	3253477	59	64	5	0.6	60	93	33	3.8
7	Upper_Harbour_N/S_SB	BEACH ROAD	21172445	294	255	-39	2.4	273	294	21	1.2
		Upper_Harbour_N/S_SB - - Total		6588	6680	92	1.1	6565	7070	505	6.1
9	Takapuna_In	FRED THOMAS DRIVE	5806508	235	198	-37	2.5	251	196	-55	3.7
9	Takapuna_In	ESMONDE ROAD	5806510	1494	1589	95	2.4	1596	1716	120	2.9
9	Takapuna_In	TAHAROTO ROAD	5805380	876	644	-232	8.4	894	707	-187	6.6
9	Takapuna_In	KITCHENER ROAD	5810962	489	554	65	2.8	492	569	77	3.3
		Takapuna_In - - Total		3094	2985	-109	2.0	3233	3188	-45	0.8
9	Takapuna_Out	ESMONDE ROAD	5806490	1777	1821	44	1.0	1847	1802	-45	1.1
9	Takapuna_Out	TAHAROTO ROAD	5805377	818	748	-70	2.5	899	803	-96	3.3
9	Takapuna_Out	KITCHENER ROAD	5810965	484	611	127	5.4	533	536	3	0.1
		Takapuna_Out - - Total		3079	3180	101	1.8	3279	3141	-138	2.4
10	Northern E/W_EB	LONELY TRACK ROAD	3220283	58	91	33	3.8	57	120	63	6.7
10	Northern E/W_EB	OTEHA VALLEY ROAD	3217048	811	678	-133	4.9	899	643	-256	9.2
10	Northern E/W_EB	MCCLYMONTS ROAD	3233107	425	372	-53	2.7	467	415	-52	2.5
10	Northern E/W_EB	ALBANY EXPRESSWAY	3216368	847	1382	535	**16.0**	945	1399	454	**13.3**
10	Northern E/W_EB	ALBANY EXPRESSWAY	3212322	221	144	-77	5.7	276	171	-105	7.0
10	Northern E/W_EB	UPPER HARBOUR HIGHWAY	5811468	560	637	77	3.1	547	623	76	3.1
10	Northern E/W_EB	UPPER HARBOUR HIGHWAY	5811435	1157	1052	-105	3.2	1212	1116	-96	2.8
10	Northern E/W_EB	ROSEDALE ROAD	3240410	700	532	-168	6.8	770	493	-277	11.0
10	Northern E/W_EB	SUNSET ROAD	5812500	335	382	47	2.5	362	394	32	1.6
10	Northern E/W_EB	SUNNYNOOK ROAD	5812528	481	503	22	1.0	524	507	-17	0.7

SL	Location	Road Section	Section ID	11:00 AM - 12:00 PM Obs	Mod	Diff	GEH	12:00 PM - 01:00 PM Obs	Mod	Diff	GEH
10	Northern E/W_EB	TRISTRAM AVENUE ON RAMP	5814040	509	346	-163	7.9	509	363	-146	7.0
10	Northern E/W_EB	TRISTRAM AVENUE	5814038	832	828	-4	0.1	880	791	-89	3.1
10	Northern E/W_EB	WAIRAU ROAD	12198193	720	868	148	5.3	726	875	149	5.3
		NORTHCOTE ROAD	5817782	914	824	-90	3.1	1014	848	-166	5.4
10	Northern E/W_EB	AKORANGA DRIVE	5806715	403	363	-40	2.0	458	360	-98	4.8
10	Northern E/W_EB	EXMOUTH ROAD	10618859	179	61	-118	10.8	168	81	-87	7.8
		ONEWA ROAD	5819870	27	34	7	1.3	30	25	-5	1.0
		ONEWA ROAD	5819872	1190	1474	284	7.8	1188	1394	206	5.7
9		**- - Total**		0	0	0	--	0	0	0	--
9											
		LONELY TRACK ROAD	3220279	49	76	27	3.4	60	84	24	2.8
10	Northern E/W_WB	OTEHA VALLEY ROAD	12198187	870	682	-188	6.7	875	760	-115	4.0
10	Northern E/W_WB	MCCLYMONTS ROAD	12198175	456	456	0	0.0	476	463	-13	0.6
10	Northern E/W_WB	ALBANY EXPRESSWAY	12198172	1202	1354	152	4.3	1285	1378	93	2.5
10	Northern E/W_WB	UPPER HARBOUR HIGHWAY	5812153	1815	1792	-23	0.5	1959	1695	-264	6.2
10	Northern E/W_WB	ROSEDALE ROAD	3211527	710	623	-87	3.4	798	651	-147	5.5
10	Northern E/W_WB	SUNSET ROAD	5811898	328	489	161	8.0	352	496	144	7.0
10	Northern E/W_WB	SUNNYNOOK ROAD	10617570	400	423	23	1.1	414	415	1	0.0
10	Northern E/W_WB	CROFTFIELD LANE	12198199	422	499	77	3.6	474	541	67	3.0
10	Northern E/W_WB	TRISTRAM AVENUE	5814078	1264	1197	-67	1.9	1223	1211	-12	0.3
10	Northern E/W_WB	NORTHCOTE ROAD	5816713	808	1050	242	7.9	813	987	174	5.8
10	Northern E/W_WB	WAIRAU ROAD	12198196	667	704	37	1.4	702	663	-39	1.5
10	Northern E/W_WB	AKORANGA DRIVE	5806721	71	283	212	**15.9**	87	298	211	**15.2**
10	Northern E/W_WB	AKORANGA DRIVE	5806723	539	171	-368	**19.5**	533	166	-367	**19.6**
10	Northern E/W_WB	EXMOUTH ROAD	5819919	125	95	-30	2.9	138	74	-64	6.2
10	Northern E/W_WB	ONEWA ROAD OFF RAMP	5807162	509	343	-166	8.0	605	362	-243	11.1
10	Northern E/W_WB	ONEWA ROAD OFF RAMP	5820901	531	814	283	10.9	592	875	283	10.4
10	Northern E/W_WB	STAFFORD ROAD OFF RAMP	5821190	130	204	74	5.7	149	210	61	4.6
		Northern E/W_WB - - Total		10847	11179	332	3.2	11475	11245	-230	2.2
11	Harbour_EB/NB	NORTHERN MOTORWAY	10274869	4686	4830	144	2.1	5011	4970	-41	0.6
11	Harbour_EB/NB	CURRAN STREET ON RAMP	10274850	466	487	21	1.0	518	458	-60	2.7
11	Harbour_EB/NB	UPPER HARBOUR MOTORWAY	10217229	1266	1198	-68	1.9	1251	1225	-26	0.7
11	Harbour_EB/NB		21172396	179	187	8	0.6	175	189	14	1.0
		Harbour_EB/NB - - Total		6597	6702	105	1.3	6955	6842	-113	1.4
11	Harbour_WB/SB	NORTHERN MOTORWAY	10274859	5093	5097	4	0.1	4947	5260	313	4.4
11	Harbour_WB/SB	SHELLY BEACH ROAD OFF RAMP	10274855	564	478	-86	3.8	552	491	-61	2.7
11	Harbour_WB/SB	UPPER HARBOUR MOTORWAY	3237819	1244	967	-277	8.3	1310	1007	-303	8.9
11	Harbour_WB/SB	COATESVILLE-RIVERHEAD HIGHWAY	3232882	179	239	60	4.2	188	258	70	4.7
		Harbour_WB/SB - - Total		7080	6781	-299	3.6	6997	7016	19	0.2
12	Waitakere West_EB	SWANSON ROAD	12198220	769	663	-106	4.0	746	677	-69	2.6
12	Waitakere West_EB	BORDER ROAD	10232628	282	254	-28	1.7	286	244	-42	2.6

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12	Waitakere West_EB	HENDERSON VALLEY ROAD	12047859	152	224	72	5.3	164	217	53	3.8
12	Waitakere West_EB	UNIVERSAL DRIVE	12198208	647	638	-9	0.4	639	759	120	4.5
12	Waitakere West_EB	LARNOCH ROAD	12198217	163	151	-12	1.0	172	173	1	0.1
12	Waitakere West_EB	RATHGAR ROAD	10211897	187	182	-5	0.4	199	232	33	2.2
12	Waitakere West_EB	TRIANGLE ROAD	10219227	378	227	-151	8.7	371	239	-132	7.6
12	Waitakere West_EB	LINCOLN ROAD OFF RAMP	10209598	819	754	-65	2.3	844	761	-83	2.9
12	Waitakere West_EB	NORTH-WESTERN MOTORWAY	10209946	1436	1408	-28	0.7	1386	1342	-44	1.2
12	Waitakere West_EB	TRIANGLE ROAD	12198202	378	227	-151	8.7	371	239	-132	7.6
		Waitakere West_EB - - Total		5211	4728	-483	6.9	5178	4883	-295	4.2
12	Waitakere West_WB	SWANSON ROAD	10232716	732	685	-47	1.8	753	635	-118	4.5
12	Waitakere West_WB	BORDER ROAD	10233566	272	226	-46	2.9	299	236	-63	3.9
12	Waitakere West_WB	HENDERSON VALLEY ROAD	12047847	150	196	46	3.5	165	213	48	3.5
12	Waitakere West_WB	UNIVERSAL DRIVE	10212048	531	647	116	4.8	587	614	27	1.1
12	Waitakere West_WB	LARNOCH ROAD	10217669	168	136	-32	2.6	181	134	-47	3.7
12	Waitakere West_WB	RATHGAR ROAD	10211200	188	154	-34	2.6	222	198	-24	1.7
12	Waitakere West_WB	TRIANGLE ROAD	12198205	370	297	-73	4.0	375	290	-85	4.7
12	Waitakere West_WB	NORTH-WESTERN MOTORWAY	10225485	1388	1206	-182	5.1	1463	1129	-334	9.3
12	Waitakere West_WB	LINCOLN ROAD ON RAMP	10213816	862	895	33	1.1	912	791	-121	4.1
12	Waitakere West_WB	TRIANGLE ROAD	10208035	370	296	-74	4.1	375	294	-81	4.4
		Waitakere West_WB - - Total		5031	4738	-293	4.2	5332	4534	-798	11.4
14	Central Waitakere E/W_EB	NORTH-WESTERN MOTORWAY	81102839	2739	2481	-258	5.1	2667	2447	-220	4.4
14	Central Waitakere E/W_EB	TE ATATU ROAD ON RAMP	10208608	432	364	-68	3.4	432	401	-31	1.5
14	Central Waitakere E/W_EB	BUTTERWORTH DRIVE	10234034	105	130	25	2.3	117	123	6	0.5
14	Central Waitakere E/W_EB	GREAT NORTH ROAD	10233852	1268	1460	192	5.2	1219	1520	301	8.1
14	Central Waitakere E/W_EB	WEST COAST ROAD	10239481	709	917	208	7.3	688	936	248	8.7
14	Central Waitakere E/W_EB	OATES ROAD	10239843	234	49	-185	**15.6**	213	35	-178	**16.0**
14	Central Waitakere E/W_EB	KAURILANDS ROAD	10235685	224	194	-30	2.1	216	194	-22	1.5
		Central Waitakere E/W_EB - - Total		5711	5595	-116	1.5	5552	5656	104	1.4
14	Central Waitakere E/W_WB	NORTH-WESTERN MOTORWAY	10210303	1820	1354	-466	11.7	1990	1282	-708	**17.5**
14	Central Waitakere E/W_WB	TE ATATU ROAD OFF RAMP	10208443	903	1210	307	9.4	1014	1234	220	6.6
14	Central Waitakere E/W_WB	BUTTERWORTH DRIVE	10234039	112	103	-9	0.9	146	119	-27	2.3
14	Central Waitakere E/W_WB	GREAT NORTH ROAD	10233038	1092	1503	411	11.4	1158	1428	270	7.5
14	Central Waitakere E/W_WB	WEST COAST ROAD	10238752	686	857	171	6.2	709	807	98	3.6
14	Central Waitakere E/W_WB	OATES ROAD	10239847	189	97	-92	7.7	192	80	-112	9.6
14	Central Waitakere E/W_WB	KAURILANDS ROAD	10235680	212	159	-53	3.9	224	143	-81	6.0
		Central Waitakere E/W_WB - - Total		5014	5283	269	3.7	5433	5093	-340	4.7
15	Central Waitakere E/W 2_EB	ASH STREET	10250856	959	1104	145	4.5	970	1049	79	2.5
15	Central Waitakere E/W 2_EB	GREAT NORTH ROAD	10262678	750	475	-275	11.1	788	490	-298	11.8
15	Central Waitakere E/W 2_EB	NORTH-WESTERN MOTORWAY	10209937	3171	2840	-331	6.0	3099	2847	-252	4.6
15	Central Waitakere E/W 2_EB	WOLVERTON STREET	12251257	966	907	-59	1.9	1000	850	-150	4.9

SL	Location	Road Section	Section ID	11:00 AM - 12:00 PM Obs	Mod	Diff	GEH	12:00 PM - 01:00 PM Obs	Mod	Diff	GEH
15	Central Waitakere E/W 2_EB	BOLTON STREET	10238601	220	190	-30	2.1	210	211	1	0.1
15	Central Waitakere E/W 2_EB	KINROSS STREET	10235459	367	591	224	10.2	373	587	214	9.8
15	Central Waitakere E/W 2_EB	CONNAUGHT STREET	10617780	60	64	4	0.5	63	57	-6	0.8
		Central Waitakere E/W 2_EB - - Total		6493	6171	-322	4.0	6503	6091	-412	5.2
15	Central Waitakere E/W 2_WB	ASH STREET	12198241	907	813	-94	3.2	974	862	-112	3.7
15	Central Waitakere E/W 2_WB	GREAT NORTH ROAD	10251825	693	681	-12	0.5	758	649	-109	4.1
15	Central Waitakere E/W 2_WB	CLARK STREET	10233603	1039	840	-199	6.5	1098	893	-205	6.5
15	Central Waitakere E/W 2_WB	NORTH-WESTERN MOTORWAY	10210105	2723	2562	-161	3.1	3004	2523	-481	9.1
15	Central Waitakere E/W 2_WB	BOLTON STREET	10236510	213	306	93	5.8	218	292	74	4.6
15	Central Waitakere E/W 2_WB	KINROSS STREET	10233123	348	525	177	8.5	384	557	173	8.0
15	Central Waitakere E/W 2_WB	CONNAUGHT STREET	10233892	59	76	17	2.1	57	57	0	0.0
		Central Waitakere E/W 2_WB - - Total		5982	5803	-179	2.3	6493	5833	-660	8.4
17	CBD_In	FANSHAWE STREET OFF RAMP	10275087	951	640	-311	11.0	885	605	-280	10.3
17	CBD_In	COLLEGE HILL	10279313	464	491	27	1.2	504	533	29	1.3
17	CBD_In	FRANKLIN ROAD	10279045	458	481	23	1.1	491	514	23	1.0
17	CBD_In	COOK STREET OFF RAMP	10278930	639	575	-64	2.6	620	628	8	0.3
17	CBD_In	WELLINGTON STREET	10278007	275	286	11	0.7	300	391	91	4.9
17	CBD_In	NELSON STREET OFF RAMP	10277538	323	436	113	5.8	328	425	97	5.0
17	CBD_In	NELSON STREET OFF RAMP	10277536	660	713	53	2.0	734	693	-41	1.5
17	CBD_In	NELSON STREET OFF RAMP	10277511	547	788	241	9.3	562	801	239	9.2
17	CBD_In	HOPETOUN STREET	10276833	336	310	-26	1.4	378	236	-142	8.1
17	CBD_In	KARANGAHAPE ROAD	10276583	490	279	-211	10.8	559	291	-268	**13.0**
17	CBD_In	UPPER QUEEN STREET	10276516	693	721	28	1.1	710	677	-33	1.3
17	CBD_In	SYMONDS STREET	10258696	843	454	-389	**15.3**	874	552	-322	12.1
17	CBD_In	GRAFTON BRIDGE	10275209	51	75	24	3.0	46	87	41	5.0
17	CBD_In	WELLESLEY STREET EAST	10273821	756	1359	603	**18.5**	752	1246	494	**15.6**
17	CBD_In	GRAFTON ROAD	10275248	177	136	-41	3.3	205	172	-33	2.4
17	CBD_In	ALTEN ROAD	10277694	270	377	107	5.9	289	426	137	7.2
17	CBD_In	BEACH ROAD	10274031	615	817	202	7.5	638	866	228	8.3
17	CBD_In	QUAY STREET	10273873	550	429	-121	5.5	602	441	-161	7.1
		CBD_In - - Total		9098	9367	269	2.8	9477	9584	107	1.1
17	CBD_Out	FANSHAWE STREET ON RAMP	10281312	906	792	-114	3.9	1027	815	-212	7.0
17	CBD_Out	COLLEGE HILL	10279309	479	411	-68	3.2	533	402	-131	6.1
17	CBD_Out	FRANKLIN ROAD	10279056	435	403	-32	1.6	473	336	-137	6.8
17	CBD_Out	WELLINGTON STREET	10277993	785	968	183	6.2	850	1032	182	5.9
17	CBD_Out		10277073	1281	1413	132	3.6	1386	1400	14	0.4
17	CBD_Out	HOBSON STREET ON RAMP	10277067	595	750	155	6.0	648	778	130	4.9
17	CBD_Out	HOPETOUN STREET	10277258	244	239	-5	0.3	295	290	-5	0.3
17	CBD_Out	KARANGAHAPE ROAD	10276594	529	229	-300	**15.4**	576	232	-344	**17.1**
17	CBD_Out	UPPER QUEEN STREET	10251439	390	380	-10	0.5	457	422	-35	1.7
17	CBD_Out	SYMONDS STREET	10283030	522	565	43	1.8	535	508	-27	1.2

SL	Location	Road Section	Section ID	11:00 AM - 12:00 PM Obs	Mod	Diff	GEH	12:00 PM - 01:00 PM Obs	Mod	Diff	GEH
17	CBD_Out	SYMONDS STREET ON RAMP	10276178	419	444	25	1.2	462	453	-9	0.4
17	CBD_Out	GRAFTON BRIDGE	10275204	64	109	45	4.8	80	97	17	1.8
17	CBD_Out	WELLESLEY STREET EAST	10273819	198	305	107	6.7	235	300	65	4.0
17	CBD_Out	GRAFTON ROAD	10275244	270	278	8	0.5	298	352	54	3.0
17	CBD_Out	ALTEN ROAD	10277690	507	640	133	5.6	553	669	116	4.7
17	CBD_Out	BEACH ROAD	10274044	521	417	-104	4.8	593	399	-194	8.7
17	CBD_Out	QUAY STREET	10273882	586	548	-38	1.6	635	552	-83	3.4
		CBD_Out - - Total		8731	8891	160	1.7	9636	9037	-599	6.2
19	Isthmus_In	MEOLA ROAD	10263753	347	395	48	2.5	335	333	-2	0.1
19	Isthmus_In	GREAT NORTH ROAD	10254351	665	577	-88	3.5	730	516	-214	8.6
19	Isthmus_In	NORTH-WESTERN MOTORWAY	10261992	3448	3284	-164	2.8	3219	3303	84	1.5
19	Isthmus_In	ST LUKES ROAD	10254131	1132	976	-156	4.8	1187	1138	-49	1.4
19	Isthmus_In	NEW NORTH ROAD	10262429	331	443	112	5.7	348	414	66	3.4
19	Isthmus_In	NEW NORTH ROAD	10257494	331	444	113	5.7	348	414	66	3.4
19	Isthmus_In	SAINSBURY ROAD	10253683	129	249	120	8.7	143	236	93	6.8
19	Isthmus_In	MORNINGSIDE DRIVE	10262255	305	250	-55	3.3	361	290	-71	3.9
19	Isthmus_In	SANDRINGHAM ROAD	10251750	571	379	-192	8.8	603	326	-277	12.9
19	Isthmus_In	GORING ROAD	10261627	19	63	44	6.9	19	68	49	7.4
19	Isthmus_In	ELDON ROAD	10250883	37	83	46	5.9	38	97	59	7.2
19	Isthmus_In	DOMINION ROAD	10264465	742	860	118	4.2	807	919	112	3.8
19	Isthmus_In	HENLEY ROAD	10258458	60	7	-53	9.2	67	15	-52	8.1
19	Isthmus_In	MOUNT EDEN ROAD	10264426	596	596	0	0.0	597	632	35	1.4
19	Isthmus_In	ST ANDREWS ROAD	10261775	329	369	40	2.1	364	418	54	2.7
19	Isthmus_In	THE DRIVE	10257543	376	146	-230	14.2	416	173	-243	14.2
19	Isthmus_In	MANUKAU ROAD	10258651	873	980	107	3.5	901	859	-42	1.4
19	Isthmus_In	GREEN LANE EAST ON RAMP	10355822	1007	1014	7	0.2	1043	1028	-15	0.5
19	Isthmus_In	SOUTHERN MOTORWAY	10291652	4996	4748	-248	3.6	4964	4758	-206	3.0
19	Isthmus_In	WHETURANGI ROAD	10251227	84	18	-66	9.2	125	25	-100	11.5
19	Isthmus_In	PURIRI DRIVE	10251181	84	41	-43	5.4	125	44	-81	8.8
19	Isthmus_In	GREAT SOUTH ROAD	10266128	593	571	-22	0.9	622	614	-8	0.3
19	Isthmus_In	ASCOT AVENUE	10291420	286	545	259	12.7	304	521	217	10.7
19	Isthmus_In	REMUERA ROAD	10291456	612	422	-190	8.4	645	418	-227	9.8
19	Isthmus_In	ORAKEI ROAD	10288937	638	905	267	9.6	626	827	201	7.5
19	Isthmus_In	TAMAKI DRIVE	10285023	871	836	-35	1.2	886	839	-47	1.6
19	Isthmus_In	UPLAND ROAD	10290963	140	243	103	7.4	138	231	93	6.8
19	Isthmus_In	LUCERNE ROAD	10290985	168	181	13	1.0	169	211	42	3.0
		Isthmus_In - - Total		19770	19625	-145	1.0	20130	19667	-463	3.3
19	Isthmus_Out	MEOLA ROAD	10263582	359	270	-89	5.0	375	247	-128	7.3
19	Isthmus_Out	GREAT NORTH ROAD	10259241	523	226	-297	15.3	592	267	-325	15.7
19	Isthmus_Out	NORTH-WESTERN MOTORWAY	10255413	3003	3154	151	2.7	3188	3128	-60	1.1
19	Isthmus_Out	NEW NORTH ROAD	10262643	311	218	-93	5.7	346	192	-154	9.4
19	Isthmus_Out	ST LUKES ROAD	10254129	788	1025	237	7.9	889	957	68	2.2

SL	Location	Road Section	Section ID	11:00 AM - 12:00 PM Obs	Mod	Diff	GEH	12:00 PM - 01:00 PM Obs	Mod	Diff	GEH
19	Isthmus_Out	NEW NORTH ROAD	10257498	311	218	-93	5.7	346	192	-154	9.4
19	Isthmus_Out	SAINSBURY ROAD	10265925	122	147	25	2.2	142	161	19	1.5
19	Isthmus_Out	MORNINGSIDE DRIVE	10259357	357	311	-46	2.5	450	321	-129	6.6
19	Isthmus_Out	SANDRINGHAM ROAD	10254260	537	300	-237	11.6	569	297	-272	13.1
19	Isthmus_Out	GORING ROAD	10265208	21	98	77	10.0	23	85	62	8.4
19	Isthmus_Out	ELDON ROAD	10250875	51	70	19	2.4	60	73	13	1.6
19	Isthmus_Out	DOMINION ROAD	10261349	663	687	24	0.9	739	731	-8	0.3
19	Isthmus_Out	HENLEY ROAD	10256312	61	91	30	3.4	67	95	28	3.1
19	Isthmus_Out	MOUNT EDEN ROAD	10252818	492	450	-42	1.9	515	397	-118	5.5
19	Isthmus_Out	ST ANDREWS ROAD	10261770	220	163	-57	4.1	239	269	30	1.9
19	Isthmus_Out	THE DRIVE	10252287	315	473	158	8.0	380	401	21	1.1
19	Isthmus_Out		10257382	884	761	-123	4.3	921	675	-246	8.7
19	Isthmus_Out	SOUTHERN MOTORWAY	10291690	4965	4933	-32	0.5	5032	5104	72	1.0
19	Isthmus_Out	GREEN LANE EAST OFF RAMP	10291632	1093	1122	29	0.9	1139	1222	83	2.4
19	Isthmus_Out	WHETURANGI ROAD	10254317	74	114	40	4.1	112	88	-24	2.4
19	Isthmus_Out	PURIRI DRIVE	10251192	91	47	-44	5.3	110	34	-76	9.0
19	Isthmus_Out	GREAT SOUTH ROAD	10261861	615	350	-265	12.1	652	458	-194	8.2
19	Isthmus_Out	CLONBERN ROAD	10291641	47	82	35	4.4	55	85	30	3.6
19	Isthmus_Out	ASCOT AVENUE	10291413	393	549	156	7.2	401	565	164	7.5
19	Isthmus_Out	REMUERA ROAD	10291460	491	285	-206	10.5	477	262	-215	11.2
19	Isthmus_Out	ORAKEI ROAD	10288938	644	837	193	7.1	687	790	103	3.8
19	Isthmus_Out	TAMAKI DRIVE	10285025	664	873	209	7.5	725	875	150	5.3
19	Isthmus_Out	LUCERNE ROAD	10290984	141	122	-19	1.7	137	130	-7	0.6
19	Isthmus_Out	UPLAND ROAD	10290958	144	203	59	4.5	170	194	24	1.8
		Isthmus_Out - - Total		18380	18179	-201	1.5	19538	18295	-1243	9.0
21	Manukau Harbour_NB	SOUTH-WESTERN MOTORWAY	10316384	2624	2483	-141	2.8	2833	2725	-108	2.0
21	Manukau Harbour_NB	RIMU ROAD ON RAMP	10318193	610	463	-147	6.3	593	471	-122	5.3
21	Manukau Harbour_NB	SALEYARDS ROAD	12198298	636	649	13	0.5	670	606	-64	2.5
21	Manukau Harbour_NB	GREAT SOUTH ROAD	12198304	328	151	-177	11.4	344	109	-235	15.6
21	Manukau Harbour_NB	ATKINSON AVENUE	10319731	605	433	-172	7.5	667	482	-185	7.7
21	Manukau Harbour_NB	SOUTHERN MOTORWAY	10295690	4178	4457	279	4.2	4235	4451	216	3.3
21	Manukau Harbour_NB	PAKURANGA HIGHWAY	10293877	1712	1929	217	5.1	1699	1960	261	6.1
21	Manukau Harbour_NB	LAGOON DRIVE	10293857	932	287	-645	26.1	904	302	-602	24.5
		Manukau Harbour_NB - - Total		11625	10852	-773	7.3	11945	11106	-839	7.8
21	Manukau Harbour_SB	SOUTH-WESTERN MOTORWAY	10262955	2284	2330	46	1.0	2306	2351	45	0.9
21	Manukau Harbour_SB	GLOUCESTER PARK ROAD	10264406	921	1048	127	4.0	958	1005	47	1.5
21	Manukau Harbour_SB	SALEYARDS ROAD	10320263	541	244	-297	15.0	545	272	-273	13.5
21	Manukau Harbour_SB	GREAT SOUTH ROAD	10319727	380	205	-175	10.2	422	193	-229	13.1
21	Manukau Harbour_SB	ATKINSON AVENUE	10319775	560	479	-81	3.6	607	533	-74	3.1
21	Manukau Harbour_SB	SOUTHERN MOTORWAY	10295733	4122	4094	-28	0.4	4248	4305	57	0.9
21	Manukau Harbour_SB	PAKURANGA HIGHWAY	10293878	1438	1592	154	4.0	1590	1528	-62	1.6
21	Manukau Harbour_SB	LAGOON DRIVE	10293870	782	373	-409	17.0	819	459	-360	14.2

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		Manukau Harbour_SB - - Total		11028	10365	-663	6.4	11495	10646	-849	8.1
22	Ti Rakau Dr_NB	TRUGOOD DRIVE	10299344	332	505	173	8.5	357	482	125	6.1
22	Ti Rakau Dr_NB	HARRIS ROAD	10300473	981	831	-150	5.0	1092	797	-295	9.6
22	Ti Rakau Dr_NB	GREENMOUNT DRIVE	10300632	191	127	-64	5.1	224	155	-69	5.0
22	Ti Rakau Dr_NB	HUNTINGTON DRIVE	10300192	64	131	67	6.8	63	119	56	5.9
22	Ti Rakau Dr_NB	TE KOHA ROAD	10300295	191	219	28	2.0	272	220	-52	3.3
22	Ti Rakau Dr_NB	TE KOHA ROAD	10300297	63	95	32	3.6	77	66	-11	1.3
22	Ti Rakau Dr_NB	TE IRIRANGI DRIVE	10300014	164	39	-125	12.4	163	41	-122	12.1
22	Ti Rakau Dr_NB	TE IRIRANGI DRIVE	10300016	646	877	231	8.4	816	871	55	1.9
22	Ti Rakau Dr_NB	CHAPEL ROAD	10298408	219	230	11	0.7	229	200	-29	2.0
22	Ti Rakau Dr_NB	CHAPEL ROAD	10298406	421	490	69	3.2	447	472	25	1.2
22	Ti Rakau Dr_NB	KILKENNY DRIVE	12047577	164	155	-9	0.7	162	128	-34	2.8
22	Ti Rakau Dr_NB	POINT VIEW DRIVE	10300109	30	17	-13	2.7	29	10	-19	4.3
		Ti Rakau Dr_NB - - Total		3466	3716	250	4.2	3931	3561	-370	6.0
22	Ti Rakau Dr_SB	TRUGOOD DRIVE	10299337	365	185	-180	10.9	442	144	-298	**17.4**
22	Ti Rakau Dr_SB	HARRIS ROAD	10300470	899	1034	135	4.3	1092	996	-96	3.0
22	Ti Rakau Dr_SB	GREENMOUNT DRIVE	10300629	170	130	-40	3.3	195	117	-78	6.2
22	Ti Rakau Dr_SB	HUNTINGTON DRIVE	10300188	57	150	93	9.1	61	142	81	8.0
22	Ti Rakau Dr_SB	TE KOHA ROAD	10300306	274	141	-133	9.2	366	162	-204	**12.6**
22	Ti Rakau Dr_SB	TE IRIRANGI DRIVE	10300008	1074	1423	349	9.9	1085	1494	409	11.4
22	Ti Rakau Dr_SB	CHAPEL ROAD	10298387	532	559	27	1.2	573	475	-98	4.3
22	Ti Rakau Dr_SB	KILKENNY DRIVE	12047565	167	14	-153	**16.1**	141	10	-131	**15.1**
22	Ti Rakau Dr_SB	POINT VIEW DRIVE	10298103	36	8	-28	6.0	37	21	-16	3.0
		Ti Rakau Dr_SB - - Total		3574	3644	70	1.2	3992	3561	-431	7.0
23	East Tamaki_In	EAST TAMAKI ROAD	10302595	991	1257	266	7.9	1061	1295	234	6.8
23	East Tamaki_In	HIGHBROOK DRIVE	10301445	1410	1220	-190	5.2	1474	1420	-54	1.4
		East Tamaki_In - - Total		2401	2477	76	1.5	2535	2715	180	3.5
23	East Tamaki_Out	EAST TAMAKI ROAD	10304313	1000	1464	464	**13.2**	1076	1420	344	9.7
23	East Tamaki_Out	HIGHBROOK DRIVE	10301436	1372	1057	-315	9.0	1374	1050	-324	9.3
		East Tamaki_Out - - Total		2372	2521	149	3.0	2450	2470	20	0.4
24	Airport_In	SOUTH-WESTERN MOTORWAY	10316944	1289	1368	79	2.2	1277	1396	119	3.3
24	Airport_In	IDLEWILD AVENUE	10316961	163	112	-51	4.3	189	141	-48	3.7
24	Airport_In	KIRKBRIDE ROAD	10316977	288	208	-80	5.1	322	202	-120	7.4
24	Airport_In	GREENWOOD ROAD	10317353	94	164	70	6.2	104	166	62	5.3
24	Airport_In	PUHINUI ROAD	10322951	783	739	-44	1.6	857	839	-18	0.6
24	Airport_In	KIRKBRIDE ROAD	10317910	422	354	-68	3.5	353	442	89	4.5
24	Airport_In	SOUTH-WESTERN MOTORWAY	10317080	254	202	-52	3.4	238	161	-77	5.5
		Airport_In - - Total		3293	3147	-146	2.6	3340	3347	7	0.1

SL	Location	Road Section	Section ID	11:00 AM - 12:00 PM Obs	Mod	Diff	GEH	12:00 PM - 01:00 PM Obs	Mod	Diff	GEH
24	Airport_Out	BADER DRIVE OFF RAMP	10317044	74	188	114	10.0	90	172	82	7.2
24	Airport_Out	SOUTH-WESTERN MOTORWAY	10316782	997	1104	107	3.3	1168	1130	-38	1.1
24	Airport_Out	IDLEWILD AVENUE	10316963	153	89	-64	5.8	150	92	-58	5.3
24	Airport_Out	KIRKBRIDE ROAD	10316980	310	281	-29	1.7	326	336	10	0.5
24	Airport_Out	GREENWOOD ROAD	10317348	65	183	118	10.6	76	195	119	10.2
24	Airport_Out	PUHINUI ROAD	12198331	673	758	85	3.2	830	695	-135	4.9
24	Airport_Out	KIRKBRIDE ROAD	10317908	457	491	34	1.6	469	501	32	1.5
		Airport_Out - - Total		2729	3094	365	6.8	3109	3121	12	0.2
26	Manukau Sth_NB	SOUTHERN MOTORWAY	10333505	4121	3642	-479	7.7	4050	3681	-369	5.9
26	Manukau Sth_NB	ORAMS ROAD	10333461	243	243	0	0.0	254	277	23	1.4
26	Manukau Sth_NB	REDOUBT ROAD	10306506	331	474	143	7.1	305	498	193	9.6
26	Manukau Sth_NB	ROSCOMMON ROAD	12198358	875	869	-6	0.2	983	921	-62	2.0
26	Manukau Sth_NB	DALGETY DRIVE	10332646	423	423	0	0.0	413	437	24	1.2
26	Manukau Sth_NB	GREAT SOUTH ROAD	12198364	674	631	-43	1.7	742	642	-100	3.8
		Manukau Sth_NB - - Total		6667	6282	-385	4.8	6747	6456	-291	3.6
26	Manukau Sth_SB	SOUTHERN MOTORWAY	10333509	3916	3540	-376	6.2	4141	3595	-546	8.8
26	Manukau Sth_SB	EUGENIA RISE	12251269	229	320	91	5.5	232	336	104	6.2
26	Manukau Sth_SB	REDOUBT ROAD	10306507	244	362	118	6.8	258	419	161	8.8
26	Manukau Sth_SB	ROSCOMMON ROAD	10321462	778	1005	227	7.6	904	957	53	1.7
26	Manukau Sth_SB	DALGETY DRIVE	10313555	390	436	46	2.3	452	417	-35	1.7
26	Manukau Sth_SB	GREAT SOUTH ROAD	10332713	739	544	-195	7.7	809	443	-366	**14.6**
		Manukau Sth_SB - - Total		6296	6207	-89	1.1	6796	6167	-629	7.8
27	Southern E/W_EB	IAN MCKINNON DRIVE	10251941	445	607	162	7.1	469	610	141	6.1
27	Southern E/W_EB	UPPER QUEEN STREET	10256997	172	40	-132	**12.8**	172	44	-128	12.3
27	Southern E/W_EB	ST BENEDICTS STREET	10255798	64	60	-4	0.5	84	73	-11	1.2
27	Southern E/W_EB	SYMONDS STREET	10258401	589	255	-334	**16.3**	603	289	-314	**14.9**
27	Southern E/W_EB	GRAFTON ROAD	10258959	389	518	129	6.1	429	489	60	2.8
27	Southern E/W_EB	KHYBER PASS ROAD	10289511	784	844	60	2.1	898	802	-96	3.3
27	Southern E/W_EB	BOSTON ROAD	10254415	402	493	91	4.3	367	487	120	5.8
27	Southern E/W_EB	MOUNTAIN ROAD	10257852	240	373	133	7.6	280	500	220	11.1
27	Southern E/W_EB	ALMORAH ROAD	10260103	12	22	10	2.4	13	13	0	0.0
27	Southern E/W_EB	GILLIES AVENUE	10290158	1278	1373	95	2.6	1314	1270	-44	1.2
27	Southern E/W_EB	BROADWAY	10290336	652	414	-238	10.3	685	376	-309	**13.4**
27	Southern E/W_EB	ST MARKS ROAD	12198244	532	410	-122	5.6	591	399	-192	8.6
27	Southern E/W_EB	MAURANUI AVENUE	10290621	110	180	70	5.8	100	196	96	7.9
27	Southern E/W_EB	MARKET ROAD	10290928	239	311	72	4.3	275	266	-9	0.5
27	Southern E/W_EB	OMAHU ROAD	10255827	159	254	95	6.6	177	300	123	8.0
27	Southern E/W_EB	GREEN LANE EAST	10254674	1697	1389	-308	7.8	1791	1468	-323	8.0
27	Southern E/W_EB		12262428	65	11	-54	8.8	75	25	-50	7.1
27	Southern E/W_EB	WALPOLE STREET	12262438	107	35	-72	8.5	147	17	-130	**14.4**
27	Southern E/W_EB	MAIN HIGHWAY	10261321	387	434	47	2.3	468	448	-20	0.9

SL	Location	Road Section	Section ID	11:00 AM - 12:00 PM				12:00 PM - 01:00 PM			
				Obs	Mod	Diff	GEH	Obs	Mod	Diff	GEH
27	Southern E/W_EB	ELLERSLIE-PANMURE HIGHWAY	10264918	822	878	56	1.9	825	1026	201	6.6
27	Southern E/W_EB	PENROSE ROAD	12198283	664	393	-271	11.8	716	334	-382	16.7
27	Southern E/W_EB	SOUTH-EASTERN HWY ON RAMP	10294863	131	49	-82	8.6	161	75	-86	7.9
27	Southern E/W_EB	SOUTH-EASTERN HWY ON RAMP	10294865	198	196	-2	0.1	217	175	-42	3.0
27	Southern E/W_EB	SOUTH-EASTERN HIGHWAY	10294860	600	746	146	5.6	663	705	42	1.6
27	Southern E/W_EB	MOUNT WELLINGTON HWY ON RAMP	10295059	438	478	40	1.9	435	493	58	2.7
27	Southern E/W_EB	MOUNT WELLINGTON HIGHWAY	10295056	1028	663	-365	12.6	1161	726	-435	14.2
27	Southern E/W_EB	CLEMOW DRIVE	10318331	351	566	215	10.0	400	486	86	4.1
27	Southern E/W_EB	PANAMA ROAD	10320164	262	230	-32	2.0	311	237	-74	4.5
27	Southern E/W_EB	EAST TAMAKI ROAD	10314455	913	1174	261	8.1	972	1315	343	10.1
27	Southern E/W_EB	TRENWITH STREET	10321374	111	190	79	6.4	144	202	58	4.4
27	Southern E/W_EB	PRINCES STREET	10295946	584	537	-47	2.0	628	558	-70	2.9
27	Southern E/W_EB	BAIRDS ROAD	10303216	650	793	143	5.3	660	767	107	4.0
27	Southern E/W_EB	REAGAN ROAD	10313223	590	739	149	5.8	600	724	124	4.8
27	Southern E/W_EB	TE IRIRANGI DRIVE	10313164	1163	950	-213	6.6	1337	933	-404	12.0
27	Southern E/W_EB	REDOUBT ROAD ON RAMP	10312777	467	552	85	3.8	486	571	85	3.7
27	Southern E/W_EB	REDOUBT ROAD	10312732	1014	807	-207	6.9	1128	816	-312	10.0
27	Southern E/W_EB	SOUTH-WESTERN MOTORWAY	10312950	617	365	-252	11.4	635	361	-274	12.3
27	Southern E/W_EB	SOUTH-WESTERN MOTORWAY	10356049	1067	1125	58	1.8	1215	1078	-137	4.0
27	Southern E/W_EB	ORAMS ROAD	12251266	243	243	0	0.0	254	277	23	1.4
27	Southern E/W_EB	GRANDE VUE ROAD	10338641	144	155	11	0.9	140	157	17	1.4
27	Southern E/W_EB	HILL ROAD	10338152	360	442	82	4.1	382	515	133	6.3
27	Southern E/W_EB	ALFRISTON ROAD	10332762	326	275	-51	2.9	375	300	-75	4.1
		Southern E/W_EB - - Total		21066	20569	-497	3.4	22783	20903	-1880	12.7
27	Southern E/W_WB	IAN MCKINNON DRIVE	10259505	316	331	15	0.8	354	410	56	2.9
27	Southern E/W_WB	UPPER QUEEN STREET	10253558	177	64	-113	10.3	188	60	-128	11.5
27	Southern E/W_WB	ST BENEDICTS STREET	10255792	88	116	28	2.8	104	129	25	2.3
27	Southern E/W_WB	SYMONDS STREET	10256210	509	512	3	0.1	560	464	-96	4.2
27	Southern E/W_WB	GRAFTON ROAD	10257148	531	565	34	1.5	548	532	-16	0.7
27	Southern E/W_WB	KHYBER PASS ROAD	10253420	1081	714	-367	12.3	1088	636	-452	15.4
27	Southern E/W_WB	BOSTON ROAD	10266721	162	220	58	4.2	156	213	57	4.2
27	Southern E/W_WB	MOUNTAIN ROAD	10289456	285	265	-20	1.2	356	268	-88	5.0
27	Southern E/W_WB	MAUNGAWHAU ROAD	10296650	14	28	14	3.1	14	35	21	4.2
27	Southern E/W_WB	GILLIES AVENUE	10290136	903	1122	219	6.9	1015	1082	67	2.1
27	Southern E/W_WB	BROADWAY	10290116	688	319	-369	16.4	707	386	-321	13.7
27	Southern E/W_WB	ST MARKS ROAD	10290617	383	276	-107	5.9	401	326	-75	3.9
27	Southern E/W_WB	MAURANUI AVENUE	10259356	35	23	-12	2.2	34	22	-12	2.3
27	Southern E/W_WB	MARKET ROAD	10290862	762	651	-111	4.2	753	650	-103	3.9
27	Southern E/W_WB	OMAHU ROAD	10290896	156	310	154	10.1	169	306	137	8.9
27	Southern E/W_WB	GREEN LANE EAST	10254443	1417	1376	-41	1.1	1491	1410	-81	2.1
27	Southern E/W_WB		12198265	100	22	-78	10.0	103	12	-91	12.0
27	Southern E/W_WB	MITCHELSON STREET	12198259	125	16	-109	13.0	128	12	-116	13.9
27	Southern E/W_WB	MAIN HIGHWAY	12198271	443	650	207	8.9	497	731	234	9.4

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27	Southern E/W_WB	ELLERSLIE-PANMURE HIGHWAY	12198277	1162	1114	-48	1.4	1188	1045	-143	4.3
27	Southern E/W_WB	PENROSE ROAD	12198286	626	540	-86	3.6	690	529	-161	6.5
27	Southern E/W_WB	SOUTH-EASTERN HIGHWAY	10296707	1089	1094	5	0.2	1074	1021	-53	1.6
27	Southern E/W_WB	MOUNT WELLINGTON HIGHWAY	10295067	1333	1356	23	0.6	1428	1302	-126	3.4
27	Southern E/W_WB	CLEMOW DRIVE	10295710	354	548	194	9.1	396	578	182	8.2
27	Southern E/W_WB	PANAMA ROAD	10295864	308	149	-159	10.5	345	175	-170	10.5
27	Southern E/W_WB	PRINCES STREET	10319933	793	865	72	2.5	745	861	116	4.1
27	Southern E/W_WB	TRENWITH STREET	10295991	108	152	44	3.9	120	180	60	4.9
27	Southern E/W_WB	BAIRDS ROAD	10303220	631	686	55	2.1	665	687	22	0.8
27	Southern E/W_WB	EAST TAMAKI ROAD	10314463	949	1243	294	8.9	1011	1159	148	4.5
27	Southern E/W_WB	REAGAN ROAD	12198340	555	694	139	5.6	542	645	103	4.2
27	Southern E/W_WB	TE IRIRANGI DRIVE	12198346	1261	831	-430	**13.3**	1286	925	-361	10.9
27	Southern E/W_WB	REDOUBT ROAD	12198352	781	622	-159	6.0	807	624	-183	6.8
27	Southern E/W_WB	AIRPORT OFF RAMP	10312901	1173	1107	-66	2.0	1228	1257	29	0.8
27	Southern E/W_WB	SOUTH-WESTERN MOTORWAY	10312924	893	733	-160	5.6	979	803	-176	5.9
27	Southern E/W_WB	GREAT SOUTH ROAD OFF RAMP	12198355	638	388	-250	11.0	629	382	-247	11.0
27	Southern E/W_WB	EUGENIA RISE	10306639	229	319	90	5.4	232	337	105	6.2
27	Southern E/W_WB	GRANDE VUE ROAD	10338198	98	113	15	1.5	106	124	18	1.7
27	Southern E/W_WB	HILL ROAD	10338155	396	429	33	1.6	370	447	77	3.8
27	Southern E/W_WB	ALFRISTON ROAD	10332770	426	429	3	0.1	411	422	11	0.5
		Southern E/W_WB - - Total		21978	20992	-986	6.7	22918	21187	-1731	11.7
28	Takanini_South_NB	GREAT SOUTH ROAD	10337904	951	834	-117	3.9	974	869	-105	3.5
28	Takanini_South_NB	MANUREWA-TAKANINI ON RAMP	10337855	924	540	-384	**14.2**	903	469	-434	**16.6**
28	Takanini_South_NB	SOUTHERN MOTORWAY	10337827	2331	1948	-383	8.3	2319	2031	-288	6.2
28	Takanini_South_NB	PORCHESTER ROAD	10336541	306	311	5	0.3	320	357	37	2.0
28	Takanini_South_NB	MILL ROAD	10336191	312	909	597	**24.2**	286	849	563	**23.6**
		Takanini_South_NB - - Total		4824	4542	-282	4.1	4802	4575	-227	3.3
28	Takanini_South_SB	SOUTHERN MOTORWAY	10337923	3136	2427	-709	**13.4**	3194	2542	-652	12.2
28	Takanini_South_SB	MILL ROAD	10336193	281	697	416	**18.8**	285	717	432	**19.3**
28	Takanini_South_SB	GREAT SOUTH ROAD	12198373	939	822	-117	3.9	995	850	-145	4.8
28	Takanini_South_SB	PORCHESTER ROAD	12198379	245	211	-34	2.3	269	224	-45	2.9
		Takanini_South_SB - - Total		4601	4157	-444	6.7	4743	4333	-410	6.1
29	Rural SE_EB	WHITFORD ROAD	10298114	282	424	142	7.6	311	407	96	5.1
29	Rural SE_EB	SANDSTONE ROAD	10334490	232	197	-35	2.4	223	245	22	1.4
29	Rural SE_EB	ALFRISTON ROAD	10333809	111	259	148	10.9	112	257	145	10.7
29	Rural SE_EB	CLEVEDON-TAKANINI ROAD	10333728	82	125	43	4.2	77	100	23	2.4
29	Rural SE_EB	PAPAKURA-CLEVEDON ROAD	25786	118	114	-4	0.4	124	108	-16	1.5
		Rural SE_EB - - Total		825	1119	294	9.4	847	1117	270	8.6
29	Rural SE_WB	WHITFORD ROAD	12198328	299	439	140	7.3	285	410	125	6.7
29	Rural SE_WB	SANDSTONE ROAD	10334491	221	251	30	2.0	219	288	69	4.3

SL	Location	Road Section	Section ID	11:00 AM - 12:00 PM Obs	Mod	Diff	GEH	12:00 PM - 01:00 PM Obs	Mod	Diff	GEH
29	Rural SE_WB	BROOKBY ROAD	10333516	107	222	115	9.0	104	200	96	7.8
29	Rural SE_WB	CLEVEDON-TAKANINI ROAD	10333742	86	121	35	3.4	84	115	31	3.1
29	Rural SE_WB	PAPAKURA-CLEVEDON ROAD	25785	136	154	18	1.5	116	138	22	2.0
		Rural SE_WB - - Total		849	1187	338	10.6	808	1151	343	11.0
30	Takanini/Papakura/Drury_In	HUNUA ROAD	10328376	95	96	1	0.1	90	82	-8	0.9
30	Takanini/Papakura/Drury_In	COAL MINE ROAD	10328528	43	22	-21	3.7	37	36	-1	0.2
30	Takanini/Papakura/Drury_In	WAIHOEHOE ROAD	10328739	122	107	-15	1.4	130	114	-16	1.4
		Takanini/Papakura/Drury_In - - Total		260	225	-35	2.2	257	232	-25	1.6
30	Takanini/Papakura/Drury_Out	HUNUA ROAD	10328372	102	117	15	1.4	104	81	-23	2.4
30	Takanini/Papakura/Drury_Out	PONGA ROAD	10328534	33	40	7	1.2	49	26	-23	3.8
30	Takanini/Papakura/Drury_Out	WAIHOEHOE ROAD	10328760	105	104	-1	0.1	129	117	-12	1.1
		Takanini/Papakura/Drury_Out - - Total		240	261	21	1.3	282	224	-58	3.6
31	Rural South_NB/EB	LINWOOD ROAD	10342125	266	560	294	14.5	241	509	268	13.8
31	Rural South_NB/EB	SOUTHERN MOTORWAY	10328282	1980	1695	-285	6.6	1938	1734	-204	4.8
31	Rural South_NB/EB	GREAT SOUTH ROAD	10328690	343	238	-105	6.2	366	288	-78	4.3
		Rural South_NB/EB - - Total		2589	2493	-96	1.9	2545	2531	-14	0.3
31	Rural South_SB/WB	HINGAIA ROAD	12047811	185	273	88	5.8	221	312	91	5.6
31	Rural South_SB/WB	SOUTHERN MOTORWAY	10328316	1931	1733	-198	4.6	1892	1731	-161	3.8
31	Rural South_SB/WB	GREAT SOUTH ROAD	10328688	324	224	-100	6.0	315	251	-64	3.8
		Rural South_SB/WB - - Total		2440	2230	-210	4.3	2428	2294	-134	2.8
32	Pukekohe_In	OSTRICH ROAD	10342706	38	67	29	4.0	41	61	20	2.8
32	Pukekohe_In	PAERATA ROAD	12047823	404	295	-109	5.8	497	273	-224	11.4
32	Pukekohe_In	CAPE HILL ROAD	10342532	52	110	58	6.4	55	128	73	7.6
32	Pukekohe_In	GOLDING ROAD	10345474	33	92	59	7.5	39	98	59	7.1
32	Pukekohe_In	BUCKLAND ROAD	10345361	255	232	-23	1.5	236	200	-36	2.4
32	Pukekohe_In	PUKEKOHE EAST ROAD	21446342	480	379	-101	4.9	473	372	-101	4.9
		Pukekohe_In - - Total		1262	1175	-87	2.5	1341	1132	-209	5.9
32	Pukekohe_Out	OSTRICH ROAD	10344422	38	98	60	7.3	34	104	70	8.4
32	Pukekohe_Out	PAERATA ROAD	10342394	421	300	-121	6.4	444	300	-144	7.5
32	Pukekohe_Out	CAPE HILL ROAD	10342533	47	110	63	7.1	51	117	66	7.2
32	Pukekohe_Out	GOLDING ROAD	10345371	32	69	37	5.2	34	82	48	6.3
32	Pukekohe_Out	BUCKLAND ROAD	10345133	258	215	-43	2.8	262	247	-15	0.9
32	Pukekohe_Out	PUKEKOHE EAST ROAD	21446345	434	417	-17	0.8	457	407	-50	2.4
		Pukekohe_Out - - Total		1230	1209	-21	0.6	1282	1257	-25	0.7
33	Waitakeres_EB	BETHELLS ROAD	10215759	71	87	16	1.8	70	80	10	1.2
33	Waitakeres_EB	SCENIC DRIVE NORTH	10243439	100	72	-28	3.0	99	88	-11	1.1
33	Waitakeres_EB	HENDERSON VALLEY ROAD	10239591	67	94	27	3.0	70	116	46	4.8

SL	Location	Road Section	Section ID	11:00 AM - 12:00 PM				12:00 PM - 01:00 PM			
				Obs	Mod	Diff	GEH	Obs	Mod	Diff	GEH
33	Waitakeres_EB	FOREST HILL ROAD	10238929	77	38	-39	5.1	84	55	-29	3.5
33	Waitakeres_EB	WEST COAST ROAD	10238720	207	186	-21	1.5	206	183	-23	1.6
33	Waitakeres_EB	HOLDENS ROAD	21619209	13	0	-13	5.1	11	0	-11	4.7
33	Waitakeres_EB	SCENIC DRIVE	10239511	35	51	16	2.4	37	67	30	4.2
33	Waitakeres_EB	WOODLANDS PARK ROAD	10233435	69	131	62	6.2	79	122	43	4.3
33	Waitakeres_EB	HUIA ROAD	10242783	194	148	-46	3.5	181	120	-61	5.0
33	Waitakeres_EB	SOUTH TITIRANGI ROAD	10232927	80	82	2	0.2	80	60	-20	2.4
		Waitakeres_EB - - Total		913	889	-24	0.8	917	891	-26	0.9
33	Waitakeres_WB	BETHELLS ROAD	10215423	53	74	21	2.6	79	60	-19	2.3
33	Waitakeres_WB	SCENIC DRIVE NORTH	10243757	81	79	-2	0.2	116	85	-31	3.1
33	Waitakeres_WB	HENDERSON VALLEY ROAD	10238116	64	93	29	3.3	70	121	51	5.2
33	Waitakeres_WB	FOREST HILL ROAD	10617942	75	112	37	3.8	88	81	-7	0.8
33	Waitakeres_WB	WEST COAST ROAD	10238725	192	152	-40	3.0	225	164	-61	4.4
33	Waitakeres_WB	HOLDENS ROAD	21619210	15	0	-15	5.5	20	0	-20	6.3
33	Waitakeres_WB	SCENIC DRIVE	10236428	30	58	28	4.2	35	62	27	3.9
33	Waitakeres_WB	WOODLANDS PARK ROAD	10233439	60	125	65	6.8	74	140	66	6.4
33	Waitakeres_WB	HUIA ROAD	10235086	190	150	-40	3.1	218	131	-87	6.6
33	Waitakeres_WB	SOUTH TITIRANGI ROAD	10617738	77	57	-20	2.4	90	93	3	0.3
		Waitakeres_WB - - Total		837	900	63	2.1	1015	937	-78	2.5

PM

SL	Location	Road Section	Section ID	04:00 PM - 05:00 PM				05:00 PM - 06:00 PM			
				Obs	Mod	Diff	GEH	Obs	Mod	Diff	GEH
1	Rural North_NB	NORTHERN GATEWAY TOLL ROAD	3227581	824	704	-120	4.3	804	711	-93	3.4
1	Rural North_NB	HIBISCUS COAST HIGHWAY	3256864	254	179	-75	5.1	263	187	-76	5.1
1	Rural North_NB	KAIPARA COAST HIGHWAY	3233089	275	396	121	6.6	338	439	101	5.1
		Rural North_NB - - Total		1353	1279	-74	2.0	1405	1337	-68	1.8
1	Rural North_SB	NORTHERN GATEWAY TOLL ROAD	3231486	557	489	-68	3.0	566	589	23	1.0
1	Rural North_SB	HIBISCUS COAST HIGHWAY	3256867	203	110	-93	7.4	198	109	-89	7.2
1	Rural North_SB	KAIPARA COAST HIGHWAY	3233094	146	265	119	8.3	142	234	92	6.7
		Rural North_SB - - Total		906	864	-42	1.4	906	932	26	0.9
2	North Shore North_NB	DAIRY FLAT HIGHWAY	3222335	477	624	147	6.3	527	589	62	2.6
2	North Shore North_NB	POSTMAN ROAD	3217257	62	19	-43	6.8	68	16	-52	8.0
2	North Shore North_NB	NORTHERN MOTORWAY	3220624	2788	2435	-353	6.9	2581	2302	-279	5.6
2	North Shore North_NB	OTEHA VALLEY ROAD ON RAMP	3221042	720	409	-311	13.1	658	319	-339	15.3
2	North Shore North_NB	EAST COAST ROAD	3255497	522	740	218	8.7	562	689	127	5.1
		North Shore North_NB - - Total		4569	4227	-342	5.2	4396	3915	-481	7.5
2	North Shore North_SB	DAIRY FLAT HIGHWAY	3222437	238	283	45	2.8	211	243	32	2.1
2	North Shore North_SB	POSTMAN ROAD	3217251	46	37	-9	1.4	61	33	-28	4.1
2	North Shore North_SB	NORTHERN MOTORWAY	3229963	887	634	-253	9.2	837	628	-209	7.7
2	North Shore North_SB	SILVERDALE ON RAMP	3234539	915	666	-249	8.9	850	689	-161	5.8
2	North Shore North_SB	EAST COAST ROAD	3260165	329	675	346	15.4	333	621	288	13.2
		North Shore North_SB - - Total		2415	2295	-120	2.5	2292	2214	-78	1.6
3	Whangaparaoa_EB	WHANGAPARAOA ROAD	3254798	1686	2040	354	8.2	1699	1892	193	4.6
3	Whangaparaoa_EB	RED BEACH ROAD	3253562	971	889	-82	2.7	1237	1005	-232	6.9
		Whangaparaoa_EB - - Total		2657	2929	272	5.1	2936	2897	-39	0.7
3	Whangaparaoa_WB	WHANGAPARAOA ROAD	3252511	862	904	42	1.4	715	949	234	8.1
3	Whangaparaoa_WB	RED BEACH ROAD	3254015	480	435	-45	2.1	460	449	-11	0.5
		Whangaparaoa_WB - - Total		1342	1339	-3	0.1	1175	1398	223	6.2
4	Rural West_EB	OLD NORTH ROAD	10212500	138	219	81	6.1	127	225	98	7.4
4	Rural West_EB	SH 16	10222230	495	455	-40	1.8	485	441	-44	2.0
4	Rural West_EB	KAHIKATEA FLAT ROAD	3239532	150	245	95	6.8	140	168	28	2.3
		Rural West_EB - - Total		783	919	136	4.7	752	834	82	2.9
4	Rural West_WB	OLD NORTH ROAD	10210127	328	369	41	2.2	357	431	74	3.7
4	Rural West_WB	SH 16	10222317	792	858	66	2.3	878	921	43	1.4
4	Rural West_WB	KAHIKATEA FLAT ROAD	3241427	388	435	47	2.3	434	451	17	0.8
		Rural West_WB - - Total		1508	1662	154	3.9	1669	1803	134	3.2

SL	Location	Road Section	Section ID	04:00 PM - 05:00 PM Obs	Mod	Diff	GEH	05:00 PM - 06:00 PM Obs	Mod	Diff	GEH
7	Upper_Harbour_N/S_NB	ALBANY HIGHWAY	3213039	1701	1756	55	1.3	1780	1787	7	0.2
7	Upper_Harbour_N/S_NB	CARIBBEAN DRIVE	21172402	556	438	-118	5.3	557	618	61	2.5
7	Upper_Harbour_N/S_NB	MEADOWOOD DRIVE	21172411	162	135	-27	2.2	196	189	-7	0.5
7	Upper_Harbour_N/S_NB	NORTHERN MOTORWAY	10355027	5079	4870	-209	3.0	4967	4698	-269	3.9
7	Upper_Harbour_N/S_NB	PARKWAY DRIVE	5811768	440	687	247	10.4	387	666	279	12.2
7	Upper_Harbour_N/S_NB	PARKWAY DRIVE	21172430	140	206	66	5.0	144	112	-32	2.8
7	Upper_Harbour_N/S_NB	EAST COAST ROAD	21172436	1284	1256	-28	0.8	1248	1320	72	2.0
7	Upper_Harbour_N/S_NB	MATIPO ROAD	3253471	163	175	12	0.9	201	351	150	9.0
7	Upper_Harbour_N/S_NB	BEACH ROAD	21172442	697	1117	420	13.9	788	981	193	6.5
		Upper_Harbour_N/S_NB - - Total		10222	10640	418	4.1	10268	10722	454	4.4
7	Upper_Harbour_N/S_SB	ALBANY HIGHWAY	5812239	1314	1204	-110	3.1	1277	1207	-70	2.0
7	Upper_Harbour_N/S_SB	CARIBBEAN DRIVE	21172405	369	282	-87	4.8	446	248	-198	10.6
7	Upper_Harbour_N/S_SB	MEADOWOOD DRIVE	21172414	170	184	14	1.1	209	118	-91	7.1
7	Upper_Harbour_N/S_SB	NORTHERN MOTORWAY	10355030	3704	4005	301	4.8	3586	3943	357	5.8
7	Upper_Harbour_N/S_SB	PARKWAY DRIVE	5811771	290	299	9	0.5	356	230	-126	7.4
7	Upper_Harbour_N/S_SB	PARKWAY DRIVE	21172433	278	437	159	8.4	283	411	128	6.9
7	Upper_Harbour_N/S_SB	EAST COAST ROAD	21172439	1406	1350	-56	1.5	1396	1242	-154	4.2
7	Upper_Harbour_N/S_SB	MATIPO ROAD	3253477	80	57	-23	2.8	90	37	-53	6.7
7	Upper_Harbour_N/S_SB	BEACH ROAD	21172445	341	351	10	0.5	333	369	36	1.9
		Upper_Harbour_N/S_SB - - Total		7952	8169	217	2.4	7976	7805	-171	1.9
9	Takapuna_In	FRED THOMAS DRIVE	5806508	358	167	-191	11.8	427	236	-191	10.5
9	Takapuna_In	ESMONDE ROAD	5806510	1670	1810	140	3.4	1674	1769	95	2.3
9	Takapuna_In	TAHAROTO ROAD	5805380	973	960	-13	0.4	1111	933	-178	5.6
9	Takapuna_In	KITCHENER ROAD	5810962	462	515	53	2.4	479	548	69	3.0
		Takapuna_In - - Total		3463	3452	-11	0.2	3691	3486	-205	3.4
9	Takapuna_Out	ESMONDE ROAD	5806490	2048	1856	-192	4.3	1878	1601	-277	6.6
9	Takapuna_Out	TAHAROTO ROAD	5805377	1304	1577	273	7.2	1450	1309	-141	3.8
9	Takapuna_Out	KITCHENER ROAD	5810965	955	1134	179	5.5	1087	1127	40	1.2
		Takapuna_Out - - Total		4307	4567	260	3.9	4415	4037	-378	5.8
10	Northern E/W_EB	LONELY TRACK ROAD	3220283	84	135	51	4.9	103	117	14	1.3
10	Northern E/W_EB	OTEHA VALLEY ROAD	3217048	1595	1455	-140	3.6	1478	1228	-250	6.8
10	Northern E/W_EB	MCCLYMONTS ROAD	3233107	908	954	46	1.5	1058	811	-247	8.1
10	Northern E/W_EB	ALBANY EXPRESSWAY	3216368	1161	1183	22	0.6	1039	1109	70	2.1
10	Northern E/W_EB	ALBANY EXPRESSWAY	3212322	361	77	-284	19.2	385	83	-302	19.7
10	Northern E/W_EB	UPPER HARBOUR HIGHWAY	5811468	876	899	23	0.8	829	816	-13	0.5
10	Northern E/W_EB	UPPER HARBOUR HIGHWAY	5811435	1196	1151	-45	1.3	1152	1046	-106	3.2
10	Northern E/W_EB	ROSEDALE ROAD	3240410	931	751	-180	6.2	848	776	-72	2.5
10	Northern E/W_EB	SUNSET ROAD	5812500	645	1016	371	12.9	642	868	226	8.2
10	Northern E/W_EB	SUNNYNOOK ROAD	5812528	853	964	111	3.7	913	983	70	2.3

SL	Location	Road Section	Section ID	04:00 PM - 05:00 PM				05:00 PM - 06:00 PM			
				Obs	Mod	Diff	GEH	Obs	Mod	Diff	GEH
10	Northern E/W_EB	TRISTRAM AVENUE ON RAMP	5814040	419	395	-24	1.2	394	276	-118	6.4
10	Northern E/W_EB	TRISTRAM AVENUE	5814038	740	801	61	2.2	710	593	-117	4.6
10	Northern E/W_EB	WAIRAU ROAD	12198193	834	1033	199	6.5	826	1062	236	7.7
10	Northern E/W_EB	NORTHCOTE ROAD	5817782	939	674	-265	9.3	903	649	-254	9.1
10	Northern E/W_EB	AKORANGA DRIVE	5806715	590	628	38	1.5	556	557	1	0.0
10	Northern E/W_EB	EXMOUTH ROAD	10618859	457	296	-161	8.3	601	339	-262	12.1
10	Northern E/W_EB	ONEWA ROAD	5819870	41	36	-5	0.8	62	21	-41	6.4
10	Northern E/W_EB	ONEWA ROAD	5819872	1191	1548	357	9.6	1250	1735	485	**12.6**
		Northern E/W_EB - - Total		13821	13996	175	1.5	13749	13069	-680	5.9
10	Northern E/W_WB	LONELY TRACK ROAD	3220279	113	239	126	9.5	160	209	49	3.6
10	Northern E/W_WB	OTEHA VALLEY ROAD	12198187	887	639	-248	9.0	911	683	-228	8.1
10	Northern E/W_WB	MCCLYMONTS ROAD	12198175	494	679	185	7.6	435	685	250	10.6
10	Northern E/W_WB	ALBANY EXPRESSWAY	12198172	1246	1009	-237	7.1	1173	1078	-95	2.8
10	Northern E/W_WB	UPPER HARBOUR HIGHWAY	5812153	2108	2160	52	1.1	1978	1936	-42	0.9
10	Northern E/W_WB	ROSEDALE ROAD	3211527	635	872	237	8.6	665	762	97	3.6
10	Northern E/W_WB	SUNSET ROAD	5811898	800	1197	397	**12.6**	924	1063	139	4.4
10	Northern E/W_WB	SUNNYNOOK ROAD	10617570	507	560	53	2.3	547	718	171	6.8
10	Northern E/W_WB	CROFTFIELD LANE	12198199	543	719	176	7.0	531	708	177	7.1
10	Northern E/W_WB	TRISTRAM AVENUE	5814078	1306	1366	60	1.6	1275	1373	98	2.7
10	Northern E/W_WB	NORTHCOTE ROAD	5816713	1357	1633	276	7.1	1497	1661	164	4.1
10	Northern E/W_WB	WAIRAU ROAD	12198196	1236	1113	-123	3.6	1184	1074	-110	3.3
10	Northern E/W_WB	AKORANGA DRIVE	5806721	34	176	142	**13.9**	19	181	162	**16.2**
10	Northern E/W_WB	AKORANGA DRIVE	5806723	1181	701	-480	**15.6**	1190	794	-396	**12.6**
10	Northern E/W_WB	EXMOUTH ROAD	5819919	355	113	-242	**15.8**	416	269	-147	7.9
10	Northern E/W_WB	ONEWA ROAD OFF RAMP	5807162	247	281	34	2.1	202	185	-17	1.2
10	Northern E/W_WB	ONEWA ROAD OFF RAMP	5820901	1202	1628	426	11.3	1376	1344	-32	0.9
10	Northern E/W_WB	STAFFORD ROAD OFF RAMP	5821190	341	480	139	6.9	446	564	118	5.3
		Northern E/W_WB - - Total		14592	15565	973	7.9	14929	15287	358	2.9
11	Harbour_EB/NB	NORTHERN MOTORWAY	10274869	7281	8193	912	10.4	7631	8575	944	10.5
11	Harbour_EB/NB	CURRAN STREET ON RAMP	10274850	811	660	-151	5.6	821	557	-264	10.1
11	Harbour_EB/NB	UPPER HARBOUR MOTORWAY	10217229	1825	1348	-477	12.0	1786	1236	-550	**14.1**
11	Harbour_EB/NB		21172396	284	335	51	2.9	323	510	187	9.2
		Harbour_EB/NB - - Total		10201	10536	335	3.3	10561	10878	317	3.1
11	Harbour_WB/SB	NORTHERN MOTORWAY	10274859	4467	4543	76	1.1	4283	4615	332	5.0
11	Harbour_WB/SB	SHELLY BEACH ROAD OFF RAMP	10274855	627	711	84	3.2	755	743	-12	0.4
11	Harbour_WB/SB	UPPER HARBOUR MOTORWAY	3237819	3203	2668	-535	9.9	3427	2606	-821	**14.9**
11	Harbour_WB/SB	COATESVILLE-RIVERHEAD HIGHWAY	3232882	382	652	270	11.9	385	679	294	**12.7**
		Harbour_WB/SB - - Total		8679	8574	-105	1.1	8850	8643	-207	2.2
12	Waitakere West_EB	SWANSON ROAD	12198220	775	691	-84	3.1	793	708	-85	3.1
12	Waitakere West_EB	BORDER ROAD	10232628	451	470	19	0.9	481	407	-74	3.5

SL	Location	Road Section	Section ID	04:00 PM - 05:00 PM Obs	Mod	Diff	GEH	05:00 PM - 06:00 PM Obs	Mod	Diff	GEH
12	Waitakere West_EB	HENDERSON VALLEY ROAD	12047859	253	484	231	12.0	270	422	152	8.2
12	Waitakere West_EB	UNIVERSAL DRIVE	12198208	614	920	306	11.0	662	898	236	8.5
12	Waitakere West_EB	LARNOCH ROAD	12198217	226	206	-20	1.4	248	166	-82	5.7
12	Waitakere West_EB	RATHGAR ROAD	10211897	295	317	22	1.3	287	322	35	2.0
12	Waitakere West_EB	TRIANGLE ROAD	10219227	366	351	-15	0.8	383	276	-107	5.9
12	Waitakere West_EB	LINCOLN ROAD OFF RAMP	10209598	1268	1241	-27	0.8	1278	1357	79	2.2
12	Waitakere West_EB	NORTH-WESTERN MOTORWAY	10209946	1930	2246	316	6.9	2195	2176	-19	0.4
12	Waitakere West_EB	TRIANGLE ROAD	12198202	366	354	-12	0.6	383	275	-108	6.0
		Waitakere West_EB - - Total		6544	7280	736	8.9	6980	7007	27	0.3
12	Waitakere West_WB	SWANSON ROAD	10232716	1243	1435	192	5.2	1362	1343	-19	0.5
12	Waitakere West_WB	BORDER ROAD	10233566	715	551	-164	6.5	775	521	-254	10.0
12	Waitakere West_WB	HENDERSON VALLEY ROAD	12047847	460	350	-110	5.5	485	348	-137	6.7
12	Waitakere West_WB	UNIVERSAL DRIVE	10212048	989	916	-73	2.4	891	866	-25	0.8
12	Waitakere West_WB	LARNOCH ROAD	10217669	318	259	-59	3.5	327	234	-93	5.6
12	Waitakere West_WB	RATHGAR ROAD	10211200	353	223	-130	7.7	339	241	-98	5.8
12	Waitakere West_WB	TRIANGLE ROAD	12198205	654	420	-234	10.1	683	389	-294	**12.7**
12	Waitakere West_WB	NORTH-WESTERN MOTORWAY	10225485	2418	2851	433	8.4	2409	2942	533	10.3
12	Waitakere West_WB	LINCOLN ROAD ON RAMP	10213816	1259	1244	-15	0.4	1237	1176	-61	1.8
12	Waitakere West_WB	TRIANGLE ROAD	10208035	654	423	-231	10.0	683	390	-293	**12.6**
		Waitakere West_WB - - Total		9063	8672	-391	4.2	9191	8450	-741	7.9
14	Central Waitakere E/W_EB	NORTH-WESTERN MOTORWAY	81102839	2861	3071	210	3.9	2994	2920	-74	1.4
14	Central Waitakere E/W_EB	TE ATATU ROAD ON RAMP	10208608	334	375	41	2.2	311	316	5	0.3
14	Central Waitakere E/W_EB	BUTTERWORTH DRIVE	10234034	156	96	-60	5.3	152	65	-87	8.4
14	Central Waitakere E/W_EB	GREAT NORTH ROAD	10233852	1638	1841	203	4.9	1685	1911	226	5.3
14	Central Waitakere E/W_EB	WEST COAST ROAD	10239481	889	1069	180	5.8	946	757	-189	6.5
14	Central Waitakere E/W_EB	OATES ROAD	10239843	344	142	-202	**13.0**	370	212	-158	9.3
14	Central Waitakere E/W_EB	KAURILANDS ROAD	10235685	410	264	-146	8.0	439	351	-88	4.4
		Central Waitakere E/W_EB - - Total		6632	6858	226	2.8	6897	6532	-365	4.5
14	Central Waitakere E/W_WB	NORTH-WESTERN MOTORWAY	10210303	3188	2992	-196	3.5	2975	2961	-14	0.3
14	Central Waitakere E/W_WB	TE ATATU ROAD OFF RAMP	10208443	1713	1808	95	2.3	1693	1955	262	6.1
14	Central Waitakere E/W_WB	BUTTERWORTH DRIVE	10234039	376	212	-164	9.6	418	212	-206	11.6
14	Central Waitakere E/W_WB	GREAT NORTH ROAD	10233038	1719	1804	85	2.0	1724	1820	96	2.3
14	Central Waitakere E/W_WB	WEST COAST ROAD	10238752	1165	1427	262	7.3	1185	1367	182	5.1
14	Central Waitakere E/W_WB	OATES ROAD	10239847	520	522	2	0.1	587	592	5	0.2
14	Central Waitakere E/W_WB	KAURILANDS ROAD	10235680	409	409	0	0.0	459	429	-30	1.4
		Central Waitakere E/W_WB - - Total		9090	9174	84	0.9	9041	9336	295	3.1
15	Central Waitakere E/W 2_EB	ASH STREET	10250856	1000	1064	64	2.0	993	1095	102	3.2
15	Central Waitakere E/W 2_EB	GREAT NORTH ROAD	10262678	789	644	-145	5.4	781	562	-219	8.5
15	Central Waitakere E/W 2_EB	NORTH-WESTERN MOTORWAY	10209937	3195	3433	238	4.1	3305	3245	-60	1.0
15	Central Waitakere E/W 2_EB	WOLVERTON STREET	12251257	1168	1070	-98	2.9	1228	1012	-216	6.5

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				Obs	Mod	Diff	GEH	Obs	Mod	Diff	GEH
15	Central Waitakere E/W 2_EB	BOLTON STREET	10238601	294	311	17	1.0	254	323	69	4.1
15	Central Waitakere E/W 2_EB	KINROSS STREET	10235459	407	686	279	11.9	431	667	236	10.1
15	Central Waitakere E/W 2_EB	CONNAUGHT STREET	10617780	78	88	10	1.1	85	110	25	2.5
		Central Waitakere E/W 2_EB - - Total		6931	7296	365	4.3	7077	7014	-63	0.8
15	Central Waitakere E/W 2_WB	ASH STREET	12198241	1309	1311	2	0.1	1010	1152	142	4.3
15	Central Waitakere E/W 2_WB	GREAT NORTH ROAD	10251825	1137	1007	-130	4.0	1197	961	-236	7.2
15	Central Waitakere E/W 2_WB	CLARK STREET	10233603	1802	1649	-153	3.7	1850	1705	-145	3.4
15	Central Waitakere E/W 2_WB	NORTH-WESTERN MOTORWAY	10210105	4901	4803	-98	1.4	4668	4918	250	3.6
15	Central Waitakere E/W 2_WB	BOLTON STREET	10236510	660	882	222	8.0	638	886	248	9.0
15	Central Waitakere E/W 2_WB	KINROSS STREET	10233123	992	1414	422	12.2	1072	1383	311	8.9
15	Central Waitakere E/W 2_WB	CONNAUGHT STREET	10233892	96	113	17	1.7	108	109	1	0.1
		Central Waitakere E/W 2_WB - - Total		10897	11179	282	2.7	10543	11114	571	5.5
17	CBD_In	FANSHAWE STREET OFF RAMP	10275087	683	484	-199	8.2	727	484	-243	9.9
17	CBD_In	COLLEGE HILL	10279313	544	587	43	1.8	562	569	7	0.3
17	CBD_In	FRANKLIN ROAD	10279045	690	708	18	0.7	680	683	3	0.1
17	CBD_In	COOK STREET OFF RAMP	10278930	542	502	-40	1.8	556	545	-11	0.5
17	CBD_In	WELLINGTON STREET	10278007	369	467	98	4.8	399	373	-26	1.3
17	CBD_In	NELSON STREET OFF RAMP	10277538	301	229	-72	4.4	380	240	-140	8.0
17	CBD_In	NELSON STREET OFF RAMP	10277536	400	463	63	3.0	520	415	-105	4.9
17	CBD_In	NELSON STREET OFF RAMP	10277511	500	903	403	**15.2**	535	783	248	9.7
17	CBD_In	HOPETOUN STREET	10276833	402	522	120	5.6	480	438	-42	2.0
17	CBD_In	KARANGAHAPE ROAD	10276583	541	369	-172	8.1	581	351	-230	10.7
17	CBD_In	UPPER QUEEN STREET	10276516	791	753	-38	1.4	765	715	-50	1.8
17	CBD_In	SYMONDS STREET	10258696	838	673	-165	6.0	958	651	-307	10.8
17	CBD_In	GRAFTON BRIDGE	10275209	102	171	69	5.9	126	196	70	5.5
17	CBD_In	WELLESLEY STREET EAST	10273821	625	1065	440	**15.1**	771	1226	455	**14.4**
17	CBD_In	GRAFTON ROAD	10275248	285	223	-62	3.9	329	161	-168	10.7
17	CBD_In	ALTEN ROAD	10277694	327	498	171	8.4	374	453	79	3.9
17	CBD_In	BEACH ROAD	10274031	642	688	46	1.8	696	682	-14	0.5
17	CBD_In	QUAY STREET	10273873	786	714	-72	2.6	746	630	-116	4.4
		CBD_In - - Total		9368	10019	651	6.6	10185	9595	-590	5.9
17	CBD_Out	FANSHAWE STREET ON RAMP	10281312	2596	2426	-170	3.4	2872	2632	-240	4.6
17	CBD_Out	COLLEGE HILL	10279309	654	657	3	0.1	819	786	-33	1.2
17	CBD_Out	FRANKLIN ROAD	10279056	709	516	-193	7.8	898	736	-162	5.7
17	CBD_Out	WELLINGTON STREET	10277993	700	707	7	0.3	770	720	-50	1.8
17	CBD_Out		10277073	931	1696	765	**21.1**	994	1440	446	**12.8**
17	CBD_Out	HOBSON STREET ON RAMP	10277067	1494	1401	-93	2.4	1409	1089	-320	9.1
17	CBD_Out	HOPETOUN STREET	10277258	387	381	-6	0.3	559	507	-52	2.3
17	CBD_Out	KARANGAHAPE ROAD	10276594	667	342	-325	**14.5**	786	255	-531	**23.3**
17	CBD_Out	UPPER QUEEN STREET	10251439	694	491	-203	8.3	858	719	-139	5.0
17	CBD_Out	SYMONDS STREET	10283030	752	632	-120	4.6	818	635	-183	6.8

SL	Location	Road Section	Section ID	04:00 PM - 05:00 PM				05:00 PM - 06:00 PM			
				Obs	Mod	Diff	GEH	Obs	Mod	Diff	GEH
17	CBD_Out	SYMONDS STREET ON RAMP	10276178	513	426	-87	4.0	504	400	-104	4.9
17	CBD_Out	GRAFTON BRIDGE	10275204	108	72	-36	3.8	127	72	-55	5.5
17	CBD_Out	WELLESLEY STREET EAST	10273819	360	508	148	7.1	372	711	339	**14.6**
17	CBD_Out	GRAFTON ROAD	10275244	356	238	-118	6.8	351	423	72	3.7
17	CBD_Out	ALTEN ROAD	10277690	664	810	146	5.4	636	774	138	5.2
17	CBD_Out	BEACH ROAD	10274044	690	590	-100	4.0	784	681	-103	3.8
17	CBD_Out	QUAY STREET	10273882	1203	1756	553	**14.4**	1640	2112	472	10.9
		CBD_Out - - Total		13478	13649	171	1.5	15197	14692	-505	4.1
19	Isthmus_In	MEOLA ROAD	10263753	452	360	-92	4.6	422	375	-47	2.4
19	Isthmus_In	GREAT NORTH ROAD	10254351	771	500	-271	10.8	752	488	-264	10.6
19	Isthmus_In	NORTH-WESTERN MOTORWAY	10261992	2971	3548	577	10.1	3136	3551	415	7.2
19	Isthmus_In	ST LUKES ROAD	10254131	1378	1379	1	0.0	1310	1162	-148	4.2
19	Isthmus_In	NEW NORTH ROAD	10262429	427	618	191	8.4	566	641	75	3.1
19	Isthmus_In	NEW NORTH ROAD	10257494	427	620	193	8.4	566	638	72	2.9
19	Isthmus_In	SAINSBURY ROAD	10253683	157	403	246	**14.7**	138	381	243	**15.1**
19	Isthmus_In	MORNINGSIDE DRIVE	10262255	327	368	41	2.2	345	305	-40	2.2
19	Isthmus_In	SANDRINGHAM ROAD	10251750	768	571	-197	7.6	786	563	-223	8.6
19	Isthmus_In	GORING ROAD	10261627	29	108	79	9.5	34	88	54	6.9
19	Isthmus_In	ELDON ROAD	10250883	48	134	86	9.0	54	119	65	7.0
19	Isthmus_In	DOMINION ROAD	10264465	838	1034	196	6.4	852	991	139	4.6
19	Isthmus_In	HENLEY ROAD	10258458	105	127	22	2.0	146	96	-50	4.5
19	Isthmus_In	MOUNT EDEN ROAD	10264426	695	619	-76	3.0	711	704	-7	0.3
19	Isthmus_In	ST ANDREWS ROAD	10261775	344	379	35	1.8	334	457	123	6.2
19	Isthmus_In	THE DRIVE	10257543	416	207	-209	11.8	364	212	-152	9.0
19	Isthmus_In	MANUKAU ROAD	10258651	989	1021	32	1.0	974	884	-90	3.0
19	Isthmus_In	GREEN LANE EAST ON RAMP	10355822	972	1180	208	6.3	916	1183	267	8.2
19	Isthmus_In	SOUTHERN MOTORWAY	10291652	4205	4612	407	6.1	3872	4682	810	12.4
19	Isthmus_In	WHETURANGI ROAD	10251227	193	35	-158	**14.8**	223	56	-167	**14.1**
19	Isthmus_In	PURIRI DRIVE	10251181	193	24	-169	**16.2**	223	62	-161	**13.5**
19	Isthmus_In	GREAT SOUTH ROAD	10266128	713	797	84	3.1	711	806	95	3.4
19	Isthmus_In	ASCOT AVENUE	10291420	302	336	34	1.9	341	420	79	4.0
19	Isthmus_In	REMUERA ROAD	10291456	720	495	-225	9.1	775	562	-213	8.2
19	Isthmus_In	ORAKEI ROAD	10288937	748	1217	469	**15.0**	799	1120	321	10.4
19	Isthmus_In	TAMAKI DRIVE	10285023	1123	983	-140	4.3	955	941	-14	0.5
19	Isthmus_In	UPLAND ROAD	10290963	224	444	220	12.0	230	465	235	**12.6**
19	Isthmus_In	LUCERNE ROAD	10290985	235	175	-60	4.2	235	154	-81	5.8
		Isthmus_In - - Total		20770	22294	1524	10.4	20770	22106	1336	9.1
19	Isthmus_Out	MEOLA ROAD	10263582	829	481	-348	**13.6**	1124	638	-486	**16.4**
19	Isthmus_Out	GREAT NORTH ROAD	10259241	993	565	-428	**15.3**	997	672	-325	11.3
19	Isthmus_Out	NORTH-WESTERN MOTORWAY	10255413	4871	4960	89	1.3	4434	4415	-19	0.3
19	Isthmus_Out	NEW NORTH ROAD	10262643	725	616	-109	4.2	597	599	2	0.1
19	Isthmus_Out	ST LUKES ROAD	10254129	1030	1650	620	**16.9**	1297	1741	444	11.4

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				Obs	Mod	Diff	GEH	Obs	Mod	Diff	GEH
19	Isthmus_Out	NEW NORTH ROAD	10257498	725	615	-110	4.2	597	599	2	0.1
19	Isthmus_Out	SAINSBURY ROAD	10265925	246	213	-33	2.2	250	283	33	2.0
19	Isthmus_Out	MORNINGSIDE DRIVE	10259357	607	511	-96	4.1	751	479	-272	11.0
19	Isthmus_Out	SANDRINGHAM ROAD	10254260	871	641	-230	8.4	865	670	-195	7.0
19	Isthmus_Out	GORING ROAD	10265208	49	81	32	4.0	66	75	9	1.1
19	Isthmus_Out	ELDON ROAD	10250875	122	117	-5	0.5	156	94	-62	5.5
19	Isthmus_Out	DOMINION ROAD	10261349	851	1208	357	11.1	889	1286	397	12.0
19	Isthmus_Out	HENLEY ROAD	10256312	295	180	-115	7.5	431	161	-270	**15.7**
19	Isthmus_Out	MOUNT EDEN ROAD	10252818	911	1050	139	4.4	877	1051	174	5.6
19	Isthmus_Out	ST ANDREWS ROAD	10261770	485	488	3	0.1	555	508	-47	2.0
19	Isthmus_Out	THE DRIVE	10252287	673	651	-22	0.9	693	689	-4	0.2
19	Isthmus_Out		10257382	1163	1063	-100	3.0	1213	1123	-90	2.6
19	Isthmus_Out	SOUTHERN MOTORWAY	10291690	5220	4758	-462	6.5	5076	5390	314	4.3
19	Isthmus_Out	GREEN LANE EAST OFF RAMP	10291632	930	1359	429	**12.7**	1151	1184	33	1.0
19	Isthmus_Out	WHETURANGI ROAD	10254317	222	153	-69	5.0	259	265	6	0.4
19	Isthmus_Out	PURIRI DRIVE	10251192	194	81	-113	9.6	219	32	-187	**16.7**
19	Isthmus_Out	GREAT SOUTH ROAD	10261861	963	976	13	0.4	963	653	-310	10.9
19	Isthmus_Out	CLONBERN ROAD	10291641	66	100	34	3.7	58	163	105	10.0
19	Isthmus_Out	ASCOT AVENUE	10291413	369	632	263	11.8	365	507	142	6.8
19	Isthmus_Out	REMUERA ROAD	10291460	887	547	-340	**12.7**	905	509	-396	**14.9**
19	Isthmus_Out	ORAKEI ROAD	10288938	967	1067	100	3.1	1042	1041	-1	0.0
19	Isthmus_Out	TAMAKI DRIVE	10285025	1666	2243	577	**13.1**	2203	2591	388	7.9
19	Isthmus_Out	LUCERNE ROAD	10290984	337	451	114	5.7	341	443	102	5.2
19	Isthmus_Out	UPLAND ROAD	10290958	268	315	47	2.8	276	286	10	0.6
		Isthmus_Out - - Total		27535	27772	237	1.4	28650	28147	-503	3.0
21	Manukau Harbour_NB	SOUTH-WESTERN MOTORWAY	10316384	4937	5089	152	2.1	4768	4989	221	3.2
21	Manukau Harbour_NB	RIMU ROAD ON RAMP	10318193	954	827	-127	4.3	1144	512	-632	**22.0**
21	Manukau Harbour_NB	SALEYARDS ROAD	12198298	894	722	-172	6.1	852	726	-126	4.5
21	Manukau Harbour_NB	GREAT SOUTH ROAD	12198304	403	138	-265	**16.1**	384	196	-188	11.0
21	Manukau Harbour_NB	ATKINSON AVENUE	10319731	875	550	-325	12.2	790	623	-167	6.3
21	Manukau Harbour_NB	SOUTHERN MOTORWAY	10295690	3395	4448	1053	**16.8**	3142	4093	951	**15.8**
21	Manukau Harbour_NB	PAKURANGA HIGHWAY	10293877	1625	1440	-185	4.7	1592	1444	-148	3.8
21	Manukau Harbour_NB	LAGOON DRIVE	10293857	1207	522	-685	**23.3**	1105	607	-498	**17.0**
		Manukau Harbour_NB - - Total		14290	13736	-554	4.7	13777	13190	-587	5.1
21	Manukau Harbour_SB	SOUTH-WESTERN MOTORWAY	10262955	3606	3550	-56	0.9	3410	3798	388	6.5
21	Manukau Harbour_SB	GLOUCESTER PARK ROAD	10264406	1482	1483	1	0.0	1495	1308	-187	5.0
21	Manukau Harbour_SB	SALEYARDS ROAD	10320263	663	566	-97	3.9	680	521	-159	6.5
21	Manukau Harbour_SB	GREAT SOUTH ROAD	10319727	766	602	-164	6.3	780	458	-322	**12.9**
21	Manukau Harbour_SB	ATKINSON AVENUE	10319775	1114	844	-270	8.6	1106	866	-240	7.6
21	Manukau Harbour_SB	SOUTHERN MOTORWAY	10295733	5051	5740	689	9.4	4840	5163	323	4.6
21	Manukau Harbour_SB	PAKURANGA HIGHWAY	10293878	3368	2601	-767	**14.0**	3368	2681	-687	12.5
21	Manukau Harbour_SB	LAGOON DRIVE	10293870	2071	2451	380	8.0	2250	2392	142	2.9

SL	Location	Road Section	Section ID	04:00 PM - 05:00 PM Obs	Mod	Diff	GEH	05:00 PM - 06:00 PM Obs	Mod	Diff	GEH
		Manukau Harbour_SB - - Total		18121	17837	-284	2.1	17929	17187	-742	5.6
22	Ti Rakau Dr_NB	TRUGOOD DRIVE	10299344	322	739	417	**18.1**	240	846	606	**26.0**
22	Ti Rakau Dr_NB	HARRIS ROAD	10300473	1352	1325	-27	0.7	1056	1148	92	2.8
22	Ti Rakau Dr_NB	GREENMOUNT DRIVE	10300632	474	238	-236	**12.5**	490	304	-186	9.3
22	Ti Rakau Dr_NB	HUNTINGTON DRIVE	10300192	73	77	4	0.5	94	95	1	0.1
22	Ti Rakau Dr_NB	TE KOHA ROAD	10300295	192	122	-70	5.6	179	165	-14	1.1
22	Ti Rakau Dr_NB	TE KOHA ROAD	10300297	94	42	-52	6.3	105	70	-35	3.7
22	Ti Rakau Dr_NB	TE IRIRANGI DRIVE	10300014	91	38	-53	6.6	52	42	-10	1.5
22	Ti Rakau Dr_NB	TE IRIRANGI DRIVE	10300016	1148	1224	76	2.2	1008	1180	172	5.2
22	Ti Rakau Dr_NB	CHAPEL ROAD	10298408	358	335	-23	1.2	443	277	-166	8.7
22	Ti Rakau Dr_NB	CHAPEL ROAD	10298406	856	936	80	2.7	1008	927	-81	2.6
22	Ti Rakau Dr_NB	KILKENNY DRIVE	12047577	343	420	77	3.9	490	342	-148	7.3
22	Ti Rakau Dr_NB	POINT VIEW DRIVE	10300109	142	102	-40	3.6	257	80	-177	**13.6**
		Ti Rakau Dr_NB - - Total		5445	5598	153	2.1	5422	5476	54	0.7
22	Ti Rakau Dr_SB	TRUGOOD DRIVE	10299337	894	161	-733	**31.9**	743	133	-610	**29.1**
22	Ti Rakau Dr_SB	HARRIS ROAD	10300470	950	1051	101	3.2	833	1159	326	10.3
22	Ti Rakau Dr_SB	GREENMOUNT DRIVE	10300629	125	83	-42	4.1	65	110	45	4.8
22	Ti Rakau Dr_SB	HUNTINGTON DRIVE	10300188	107	225	118	9.2	127	182	55	4.4
22	Ti Rakau Dr_SB	TE KOHA ROAD	10300306	300	120	-180	12.4	272	49	-223	**17.6**
22	Ti Rakau Dr_SB	TE IRIRANGI DRIVE	10300008	1130	1817	687	**17.9**	1065	1745	680	**18.1**
22	Ti Rakau Dr_SB	CHAPEL ROAD	10298387	692	739	47	1.8	707	734	27	1.0
22	Ti Rakau Dr_SB	KILKENNY DRIVE	12047565	273	99	-174	**12.8**	296	50	-246	**18.7**
22	Ti Rakau Dr_SB	POINT VIEW DRIVE	10298103	53	36	-17	2.5	49	24	-25	4.1
		Ti Rakau Dr_SB - - Total		4524	4331	-193	2.9	4157	4186	29	0.4
23	East Tamaki_In	EAST TAMAKI ROAD	10302595	1528	1614	86	2.2	1476	1588	112	2.9
23	East Tamaki_In	HIGHBROOK DRIVE	10301445	1624	1806	182	4.4	1722	1899	177	4.2
		East Tamaki_In - - Total		3152	3420	268	4.7	3198	3487	289	5.0
23	East Tamaki_Out	EAST TAMAKI ROAD	10304313	1447	1331	-116	3.1	1413	1342	-71	1.9
23	East Tamaki_Out	HIGHBROOK DRIVE	10301436	1963	2180	217	4.8	1620	1520	-100	2.5
		East Tamaki_Out - - Total		3410	3511	101	1.7	3033	2862	-171	3.1
24	Airport_In	SOUTH-WESTERN MOTORWAY	10316944	1375	1373	-2	0.1	1039	1249	210	6.2
24	Airport_In	IDLEWILD AVENUE	10316961	270	215	-55	3.5	300	148	-152	10.2
24	Airport_In	KIRKBRIDE ROAD	10316977	320	303	-17	1.0	278	211	-67	4.3
24	Airport_In	GREENWOOD ROAD	10317353	117	275	158	11.3	83	199	116	9.8
24	Airport_In	PUHINUI ROAD	10322951	679	817	138	5.0	655	736	81	3.1
24	Airport_In	KIRKBRIDE ROAD	10317910	443	456	13	0.6	418	384	-34	1.7
24	Airport_In	SOUTH-WESTERN MOTORWAY	10317080	168	102	-66	5.7	118	71	-47	4.8
		Airport_In - - Total		3372	3541	169	2.9	2891	2998	107	2.0

SL	Location	Road Section	Section ID	04:00 PM - 05:00 PM Obs	Mod	Diff	GEH	05:00 PM - 06:00 PM Obs	Mod	Diff	GEH
24	Airport_Out	BADER DRIVE OFF RAMP	10317044	98	299	201	**14.3**	102	228	126	9.8
24	Airport_Out	SOUTH-WESTERN MOTORWAY	10316782	1819	2112	293	6.6	1751	2179	428	9.7
24	Airport_Out	IDLEWILD AVENUE	10316963	230	310	80	4.9	289	186	-103	6.7
24	Airport_Out	KIRKBRIDE ROAD	10316980	641	422	-219	9.5	711	290	-421	**18.8**
24	Airport_Out	GREENWOOD ROAD	10317348	247	487	240	**12.5**	290	226	-64	4.0
24	Airport_Out	PUHINUI ROAD	12198331	1264	1208	-56	1.6	1273	1378	105	2.9
24	Airport_Out	KIRKBRIDE ROAD	10317908	1047	1577	530	**14.6**	1097	1208	111	3.3
		Airport_Out - - Total		5346	6415	1069	**13.9**	5513	5695	182	2.4
26	Manukau Sth_NB	SOUTHERN MOTORWAY	10333505	3633	3751	118	1.9	3497	3578	81	1.4
26	Manukau Sth_NB	ORAMS ROAD	10333461	515	519	4	0.2	637	476	-161	6.8
26	Manukau Sth_NB	REDOUBT ROAD	10306506	489	465	-24	1.1	524	530	6	0.3
26	Manukau Sth_NB	ROSCOMMON ROAD	12198358	949	971	22	0.7	862	917	55	1.8
26	Manukau Sth_NB	DALGETY DRIVE	10332646	450	179	-271	**15.3**	369	187	-182	10.9
26	Manukau Sth_NB	GREAT SOUTH ROAD	12198364	554	544	-10	0.4	549	516	-33	1.4
		Manukau Sth_NB - - Total		6590	6429	-161	2.0	6438	6204	-234	2.9
26	Manukau Sth_SB	SOUTHERN MOTORWAY	10333509	4787	4653	-134	2.0	4306	4263	-43	0.7
26	Manukau Sth_SB	EUGENIA RISE	12251269	540	610	70	2.9	587	877	290	10.7
26	Manukau Sth_SB	REDOUBT ROAD	10306507	1190	1106	-84	2.5	1251	1233	-18	0.5
26	Manukau Sth_SB	ROSCOMMON ROAD	10321462	2365	2414	49	1.0	2344	2508	164	3.3
26	Manukau Sth_SB	DALGETY DRIVE	10313555	894	1082	188	6.0	737	1230	493	**15.7**
26	Manukau Sth_SB	GREAT SOUTH ROAD	10332713	1579	1851	272	6.6	1570	2006	436	10.3
		Manukau Sth_SB - - Total		11355	11716	361	3.4	10795	12117	1322	12.4
27	Southern E/W_EB	IAN MCKINNON DRIVE	10251941	559	674	115	4.6	554	684	130	5.2
27	Southern E/W_EB	UPPER QUEEN STREET	10256997	173	230	57	4.0	185	277	92	6.1
27	Southern E/W_EB	ST BENEDICTS STREET	10255798	60	169	109	10.2	84	126	42	4.1
27	Southern E/W_EB	SYMONDS STREET	10258401	672	531	-141	5.7	743	484	-259	10.5
27	Southern E/W_EB	GRAFTON ROAD	10258959	442	441	-1	0.0	405	379	-26	1.3
27	Southern E/W_EB	KHYBER PASS ROAD	10289511	1271	1076	-195	5.7	1295	1043	-252	7.4
27	Southern E/W_EB	BOSTON ROAD	10254415	297	253	-44	2.7	260	235	-25	1.6
27	Southern E/W_EB	MOUNTAIN ROAD	10257852	384	340	-44	2.3	391	455	64	3.1
27	Southern E/W_EB	ALMORAH ROAD	10260103	8	38	30	6.3	9	28	19	4.4
27	Southern E/W_EB	GILLIES AVENUE	10290158	1221	1389	168	4.7	1196	1356	160	4.5
27	Southern E/W_EB	BROADWAY	10290336	748	437	-311	**12.8**	596	344	-252	11.6
27	Southern E/W_EB	ST MARKS ROAD	12198244	619	424	-195	8.5	604	415	-189	8.4
27	Southern E/W_EB	MAURANUI AVENUE	10290621	175	296	121	7.9	144	289	145	9.9
27	Southern E/W_EB	MARKET ROAD	10290928	533	569	36	1.5	564	472	-92	4.0
27	Southern E/W_EB	OMAHU ROAD	10255827	351	508	157	7.6	313	701	388	**17.2**
27	Southern E/W_EB	GREEN LANE EAST	10254674	1469	1553	84	2.2	1493	1356	-137	3.6
27	Southern E/W_EB		12262428	176	32	-144	**14.1**	210	50	-160	**14.0**
27	Southern E/W_EB	WALPOLE STREET	12262438	368	136	-232	**14.6**	492	131	-361	**20.5**
27	Southern E/W_EB	MAIN HIGHWAY	10261321	861	1298	437	**13.3**	764	1188	424	**13.6**

SL	Location	Road Section	Section ID	04:00 PM - 05:00 PM				05:00 PM - 06:00 PM			
				Obs	Mod	Diff	GEH	Obs	Mod	Diff	GEH
27	Southern E/W_EB	ELLERSLIE-PANMURE HIGHWAY	10264918	529	1246	717	**24.1**	486	1039	553	**20.0**
27	Southern E/W_EB	PENROSE ROAD	12198283	1336	1114	-222	6.3	1486	1122	-364	10.1
27	Southern E/W_EB	SOUTH-EASTERN HWY ON RAMP	10294863	114	61	-53	5.7	74	72	-2	0.2
27	Southern E/W_EB	SOUTH-EASTERN HWY ON RAMP	10294865	236	415	179	9.9	198	340	142	8.7
27	Southern E/W_EB	SOUTH-EASTERN HIGHWAY	10294860	1213	894	-319	9.8	1309	885	-424	**12.8**
27	Southern E/W_EB	MOUNT WELLINGTON HWY ON RAMP	10295059	503	570	67	2.9	449	590	141	6.2
27	Southern E/W_EB	MOUNT WELLINGTON HIGHWAY	10295056	1459	1214	-245	6.7	1375	950	-425	12.5
27	Southern E/W_EB	CLEMOW DRIVE	10318331	543	615	72	3.0	465	478	13	0.6
27	Southern E/W_EB	PANAMA ROAD	10320164	380	297	-83	4.5	426	272	-154	8.2
27	Southern E/W_EB	EAST TAMAKI ROAD	10314455	1332	1511	179	4.7	1337	1362	25	0.7
27	Southern E/W_EB	TRENWITH STREET	10321374	416	165	-251	**14.7**	431	216	-215	12.0
27	Southern E/W_EB	PRINCES STREET	10295946	306	967	661	**26.2**	300	640	340	**15.7**
27	Southern E/W_EB	BAIRDS ROAD	10303216	879	1266	387	11.8	894	1116	222	7.0
27	Southern E/W_EB	REAGAN ROAD	10313223	1171	1329	158	4.5	1256	1561	305	8.1
27	Southern E/W_EB	TE IRIRANGI DRIVE	10313164	2049	1966	-83	1.9	2230	1901	-329	7.2
27	Southern E/W_EB	REDOUBT ROAD ON RAMP	10312777	378	474	96	4.7	276	404	128	6.9
27	Southern E/W_EB	REDOUBT ROAD	10312732	1326	1575	249	6.5	1011	1166	155	4.7
27	Southern E/W_EB	SOUTH-WESTERN MOTORWAY	10312950	826	865	39	1.3	862	865	3	0.1
27	Southern E/W_EB	SOUTH-WESTERN MOTORWAY	10356049	878	900	22	0.7	876	810	-66	2.3
27	Southern E/W_EB	ORAMS ROAD	12251266	515	522	7	0.3	637	473	-164	7.0
27	Southern E/W_EB	GRANDE VUE ROAD	10338641	318	592	274	**12.8**	303	633	330	**15.3**
27	Southern E/W_EB	HILL ROAD	10338152	478	754	276	11.1	483	658	175	7.3
27	Southern E/W_EB	ALFRISTON ROAD	10332762	895	883	-12	0.4	981	1140	159	4.9
		Southern E/W_EB - - Total		28467	30589	2122	12.3	28447	28706	259	1.5
27	Southern E/W_WB	IAN MCKINNON DRIVE	10259505	572	659	87	3.5	717	875	158	5.6
27	Southern E/W_WB	UPPER QUEEN STREET	10253558	247	108	-139	10.4	279	125	-154	10.8
27	Southern E/W_WB	ST BENEDICTS STREET	10255792	64	89	25	2.9	60	61	1	0.1
27	Southern E/W_WB	SYMONDS STREET	10256210	761	635	-126	4.8	822	626	-196	7.3
27	Southern E/W_WB	GRAFTON ROAD	10257148	865	871	6	0.2	679	882	203	7.3
27	Southern E/W_WB	KHYBER PASS ROAD	10253420	1111	868	-243	7.7	933	700	-233	8.2
27	Southern E/W_WB	BOSTON ROAD	10266721	168	235	67	4.7	224	221	-3	0.2
27	Southern E/W_WB	MOUNTAIN ROAD	10289456	649	540	-109	4.5	827	509	-318	12.3
27	Southern E/W_WB	MAUNGAWHAU ROAD	10296650	23	24	1	0.2	25	31	6	1.1
27	Southern E/W_WB	GILLIES AVENUE	10290136	956	1279	323	9.7	1066	1173	107	3.2
27	Southern E/W_WB	BROADWAY	10290116	938	771	-167	5.7	951	877	-74	2.4
27	Southern E/W_WB	ST MARKS ROAD	10290617	529	384	-145	6.8	595	293	-302	**14.3**
27	Southern E/W_WB	MAURANUI AVENUE	10259356	75	131	56	5.5	72	61	-11	1.3
27	Southern E/W_WB	MARKET ROAD	10290862	653	540	-113	4.6	601	706	105	4.1
27	Southern E/W_WB	OMAHU ROAD	10290896	232	317	85	5.1	268	285	17	1.0
27	Southern E/W_WB	GREEN LANE EAST	10254443	1321	2031	710	**17.3**	1513	1809	296	7.3
27	Southern E/W_WB		12198265	297	85	-212	**15.3**	377	100	-277	**17.9**
27	Southern E/W_WB	MITCHELSON STREET	12198259	139	15	-124	**14.1**	110	8	-102	**13.3**
27	Southern E/W_WB	MAIN HIGHWAY	12198271	539	592	53	2.2	478	568	90	3.9

SL	Location	Road Section	Section ID	04:00 PM - 05:00 PM Obs	Mod	Diff	GEH	05:00 PM - 06:00 PM Obs	Mod	Diff	GEH
27	Southern E/W_WB	ELLERSLIE-PANMURE HIGHWAY	12198277	875	958	83	2.7	848	1175	327	10.3
27	Southern E/W_WB	PENROSE ROAD	12198286	776	888	112	3.9	696	918	222	7.8
27	Southern E/W_WB	SOUTH-EASTERN HIGHWAY	10296707	1132	1276	144	4.2	1011	1254	243	7.2
27	Southern E/W_WB	MOUNT WELLINGTON HIGHWAY	10295067	1063	959	-104	3.3	1069	824	-245	8.0
27	Southern E/W_WB	CLEMOW DRIVE	10295710	389	699	310	**13.3**	299	554	255	12.3
27	Southern E/W_WB	PANAMA ROAD	10295864	634	381	-253	11.2	586	378	-208	9.5
27	Southern E/W_WB	PRINCES STREET	10319933	990	884	-106	3.5	951	835	-116	3.9
27	Southern E/W_WB	TRENWITH STREET	10295991	142	94	-48	4.4	151	37	-114	11.8
27	Southern E/W_WB	BAIRDS ROAD	10303220	995	1085	90	2.8	960	1010	50	1.6
27	Southern E/W_WB	EAST TAMAKI ROAD	10314463	1514	1529	15	0.4	1521	1572	51	1.3
27	Southern E/W_WB	REAGAN ROAD	12198340	859	750	-109	3.8	867	796	-71	2.5
27	Southern E/W_WB	TE IRIRANGI DRIVE	12198346	1226	952	-274	8.3	1119	976	-143	4.4
27	Southern E/W_WB	REDOUBT ROAD	12198352	638	675	37	1.4	696	787	91	3.3
27	Southern E/W_WB	AIRPORT OFF RAMP	10312901	1382	1294	-88	2.4	1259	1280	21	0.6
27	Southern E/W_WB	SOUTH-WESTERN MOTORWAY	10312924	803	954	151	5.1	619	709	90	3.5
27	Southern E/W_WB	GREAT SOUTH ROAD OFF RAMP	12198355	426	367	-59	3.0	434	325	-109	5.6
27	Southern E/W_WB	EUGENIA RISE	10306639	540	610	70	2.9	587	880	293	10.8
27	Southern E/W_WB	GRANDE VUE ROAD	10338198	137	208	71	5.4	167	103	-64	5.5
27	Southern E/W_WB	HILL ROAD	10338155	337	482	145	7.2	327	384	57	3.0
27	Southern E/W_WB	ALFRISTON ROAD	10332770	581	996	415	**14.8**	648	852	204	7.4
		Southern E/W_WB - - Total		25578	26215	637	4.0	25412	25559	147	0.9
28	Takanini_South_NB	GREAT SOUTH ROAD	10337904	1232	613	-619	**20.4**	1201	791	-410	**13.0**
28	Takanini_South_NB	MANUREWA-TAKANINI ON RAMP	10337855	688	503	-185	7.6	678	413	-265	11.3
28	Takanini_South_NB	SOUTHERN MOTORWAY	10337827	2186	2115	-71	1.5	2069	2198	129	2.8
28	Takanini_South_NB	PORCHESTER ROAD	10336541	534	1012	478	**17.2**	601	908	307	11.2
28	Takanini_South_NB	MILL ROAD	10336191	528	804	276	10.7	566	786	220	8.5
		Takanini_South_NB - - Total		5168	5047	-121	1.7	5115	5096	-19	0.3
28	Takanini_South_SB	SOUTHERN MOTORWAY	10337923	3933	3392	-541	8.9	3626	3460	-166	2.8
28	Takanini_South_SB	MILL ROAD	10336193	989	905	-84	2.7	1039	727	-312	10.5
28	Takanini_South_SB	GREAT SOUTH ROAD	12198373	1080	1528	448	12.4	1129	1332	203	5.8
28	Takanini_South_SB	PORCHESTER ROAD	12198379	769	519	-250	9.9	769	1007	238	8.0
		Takanini_South_SB - - Total		6771	6344	-427	5.3	6563	6526	-37	0.5
29	Rural SE_EB	WHITFORD ROAD	10298114	614	786	172	6.5	638	888	250	9.1
29	Rural SE_EB	SANDSTONE ROAD	10334490	613	762	149	5.7	762	714	-48	1.8
29	Rural SE_EB	ALFRISTON ROAD	10333809	219	434	215	11.9	232	450	218	11.8
29	Rural SE_EB	CLEVEDON-TAKANINI ROAD	10333728	157	227	70	5.1	164	219	55	4.0
29	Rural SE_EB	PAPAKURA-CLEVEDON ROAD	25786	175	191	16	1.2	198	169	-29	2.1
		Rural SE_EB - - Total		1778	2400	622	**13.6**	1994	2440	446	9.5
29	Rural SE_WB	WHITFORD ROAD	12198328	372	678	306	**13.4**	413	654	241	10.4
29	Rural SE_WB	SANDSTONE ROAD	10334491	191	313	122	7.7	182	323	141	8.9

SL	Location	Road Section	Section ID	04:00 PM - 05:00 PM Obs	Mod	Diff	GEH	05:00 PM - 06:00 PM Obs	Mod	Diff	GEH
29	Rural SE_WB	BROOKBY ROAD	10333516	216	280	64	4.1	301	347	46	2.6
29	Rural SE_WB	CLEVEDON-TAKANINI ROAD	10333742	85	183	98	8.5	76	149	73	6.9
29	Rural SE_WB	PAPAKURA-CLEVEDON ROAD	25785	177	301	124	8.0	179	212	33	2.4
		Rural SE_WB - - Total		1041	1755	714	**19.1**	1151	1685	534	**14.2**
30	Takanini/Papakura/Drury_In	HUNUA ROAD	10328376	105	113	8	0.8	64	114	50	5.3
30	Takanini/Papakura/Drury_In	COAL MINE ROAD	10328528	43	22	-21	3.7	53	30	-23	3.6
30	Takanini/Papakura/Drury_In	WAIHOEHOE ROAD	10328739	152	174	22	1.7	143	136	-7	0.6
		Takanini/Papakura/Drury_In - - Total		300	309	9	0.5	260	280	20	1.2
30	Takanini/Papakura/Drury_Out	HUNUA ROAD	10328372	148	180	32	2.5	149	191	42	3.2
30	Takanini/Papakura/Drury_Out	PONGA ROAD	10328534	116	76	-40	4.1	129	81	-48	4.7
30	Takanini/Papakura/Drury_Out	WAIHOEHOE ROAD	10328760	214	230	16	1.1	231	217	-14	0.9
		Takanini/Papakura/Drury_Out - - Total		478	486	8	0.4	509	489	-20	0.9
31	Rural South_NB/EB	LINWOOD ROAD	10342125	268	502	234	11.9	249	568	319	**15.8**
31	Rural South_NB/EB	SOUTHERN MOTORWAY	10328282	2079	2096	17	0.4	2076	2212	136	2.9
31	Rural South_NB/EB	GREAT SOUTH ROAD	10328690	738	400	-338	**14.2**	765	333	-432	**18.4**
		Rural South_NB/EB - - Total		3085	2998	-87	1.6	3090	3113	23	0.4
31	Rural South_SB/WB	HINGAIA ROAD	12047811	642	801	159	5.9	732	709	-23	0.9
31	Rural South_SB/WB	SOUTHERN MOTORWAY	10328316	2911	2413	-498	9.7	2836	2971	135	2.5
31	Rural South_SB/WB	GREAT SOUTH ROAD	10328688	466	519	53	2.4	452	416	-36	1.7
		Rural South_SB/WB - - Total		4019	3733	-286	4.6	4020	4096	76	1.2
32	Pukekohe_In	OSTRICH ROAD	10342706	97	162	65	5.7	134	199	65	5.0
32	Pukekohe_In	PAERATA ROAD	12047823	799	542	-257	9.9	917	471	-446	**16.9**
32	Pukekohe_In	CAPE HILL ROAD	10342532	68	307	239	**17.5**	92	335	243	**16.6**
32	Pukekohe_In	GOLDING ROAD	10345474	65	134	69	6.9	63	156	93	8.9
32	Pukekohe_In	BUCKLAND ROAD	10345361	313	326	13	0.7	229	302	73	4.5
32	Pukekohe_In	PUKEKOHE EAST ROAD	21446342	657	402	-255	11.1	638	424	-214	9.3
		Pukekohe_In - - Total		1999	1873	-126	2.9	2073	1887	-186	4.2
32	Pukekohe_Out	OSTRICH ROAD	10344422	35	94	59	7.3	41	103	62	7.3
32	Pukekohe_Out	PAERATA ROAD	10342394	474	545	71	3.1	566	434	-132	5.9
32	Pukekohe_Out	CAPE HILL ROAD	10342533	156	106	-50	4.4	175	123	-52	4.3
32	Pukekohe_Out	GOLDING ROAD	10345371	48	127	79	8.4	66	108	42	4.5
32	Pukekohe_Out	BUCKLAND ROAD	10345133	409	375	-34	1.7	446	383	-63	3.1
32	Pukekohe_Out	PUKEKOHE EAST ROAD	21446345	642	545	-97	4.0	681	541	-140	5.7
		Pukekohe_Out - - Total		1764	1792	28	0.7	1975	1692	-283	6.6
33	Waitakeres_EB	BETHELLS ROAD	10215759	69	56	-13	1.6	74	56	-18	2.2
33	Waitakeres_EB	SCENIC DRIVE NORTH	10243439	102	120	18	1.7	117	127	10	0.9
33	Waitakeres_EB	HENDERSON VALLEY ROAD	10239591	115	148	33	2.9	101	137	36	3.3

SL	Location	Road Section	Section ID	04:00 PM - 05:00 PM				05:00 PM - 06:00 PM			
				Obs	Mod	Diff	GEH	Obs	Mod	Diff	GEH
33	Waitakeres_EB	FOREST HILL ROAD	10238929	90	56	-34	4.0	78	67	-11	1.3
33	Waitakeres_EB	WEST COAST ROAD	10238720	285	253	-32	2.0	232	249	17	1.1
33	Waitakeres_EB	HOLDENS ROAD	21619209	14	0	-14	5.3	12	0	-12	4.9
33	Waitakeres_EB	SCENIC DRIVE	10239511	37	49	12	1.8	42	37	-5	0.8
33	Waitakeres_EB	WOODLANDS PARK ROAD	10233435	103	179	76	6.4	87	171	84	7.4
33	Waitakeres_EB	HUIA ROAD	10242783	219	166	-53	3.8	185	141	-44	3.4
33	Waitakeres_EB	SOUTH TITIRANGI ROAD	10232927	89	86	-3	0.3	97	93	-4	0.4
		Waitakeres_EB - - Total		1123	1113	-10	0.3	1025	1078	53	1.6
33	Waitakeres_WB	BETHELLS ROAD	10215423	168	165	-3	0.2	184	187	3	0.2
33	Waitakeres_WB	SCENIC DRIVE NORTH	10243757	224	146	-78	5.7	265	157	-108	7.4
33	Waitakeres_WB	HENDERSON VALLEY ROAD	10238116	161	196	35	2.6	182	169	-13	1.0
33	Waitakeres_WB	FOREST HILL ROAD	10617942	143	194	51	3.9	177	170	-7	0.5
33	Waitakeres_WB	WEST COAST ROAD	10238725	407	448	41	2.0	438	472	34	1.6
33	Waitakeres_WB	HOLDENS ROAD	21619210	28	0	-28	7.5	33	0	-33	8.1
33	Waitakeres_WB	SCENIC DRIVE	10236428	59	127	68	7.1	73	152	79	7.4
33	Waitakeres_WB	WOODLANDS PARK ROAD	10233439	163	251	88	6.1	163	261	98	6.7
33	Waitakeres_WB	HUIA ROAD	10235086	405	357	-48	2.5	488	339	-149	7.3
33	Waitakeres_WB	SOUTH TITIRANGI ROAD	10617738	168	194	26	1.9	204	172	-32	2.3
		Waitakeres_WB - - Total		1926	2078	152	3.4	2207	2079	-128	2.8

Appendix I

Travel Time Route Validation Results

AM 7am – 8am

Route ID	Route Name	direction	Length	AM-Obs 15th Percentile	AM-Obs Observed Mean	AM-Obs 85th Percentile	AM-modelled	% Diff	Abs Diff	Within 15% or 1 min	Within 15th/85th	+ Abs Diff
12	Albany Hwy	NORTHBOUND	11.13	15.8	23.2	33.5	19.8	-0.1	-3.4	Pass	Pass	3.82
12	Albany Hwy	SOUTHBOUND	11.13	19.1	28.9	44.0	25.5	-0.1	-3.3	Pass	Pass	16.84
17	Freight - Neilson	EASTBOUND	5.45	10.3	15.4	21.2	12.4	-0.2	-3.0	Low	Pass	5.25
17	Freight - Neilson	WESTBOUND	5.45	7.5	11.9	16.8	8.5	-0.3	-3.4	Low	Pass	3.39
18	Freight - Highbrook	EASTBOUND	6.12	6.3	9.7	14.3	10.2	0.0	0.5	Pass	Pass	2.06
18	Freight - Highbrook	WESTBOUND	6.12	6.2	8.5	11.5	20.0	1.4	11.5	High	High	12.58
23	Balmoral Road	WESTBOUND	13.52	21.1	34.5	63.8	27.2	-0.2	-7.2	Low	Pass	9.10
23	Balmoral Road	EASTBOUND	13.52	19.2	29.6	53.5	27.9	-0.1	-1.7	Pass	Pass	4.50
32	Freight - SEART	WESTBOUND	6.30	9.5	17.9	26.2	23.7	0.3	5.8	High	Pass	9.89
32	Freight - SEART	EASTBOUND	6.30	6.6	10.4	15.2	12.5	0.2	2.1	High	Pass	4.26
33	Mt Wellington Highway / Great South	NORTHBOUND	24.95	38.4	58.5	90.4	46.8	-0.2	-11.7	Low	Pass	12.46
33	Mt Wellington Highway / Great South	SOUTHBOUND	24.95	33.9	42.0	50.6	39.6	-0.1	-2.4	Pass	Pass	5.42
34	Inner Eastern	NORTHBOUND	18.59	27.8	44.8	64.3	34.5	-0.2	-10.3	Low	Pass	11.07
34	Inner Eastern	SOUTHBOUND	18.59	26.0	35.7	47.0	34.6	0.0	-1.1	Pass	Pass	5.36
35	Lincoln Road	NORTHBOUND	3.05	6.7	13.5	20.2	10.9	-0.2	-2.6	Low	Pass	3.43
35	Lincoln Road	SOUTHBOUND	3.05	3.8	6.3	9.5	5.7	-0.1	-0.6	Pass	Pass	1.17
36	Onewa Road	WESTBOUND	2.24	2.9	3.9	5.2	4.0	0.0	0.2	Pass	Pass	0.33
36	Onewa Road	EASTBOUND	2.24	4.3	9.0	14.2	13.4	0.5	4.4	High	Pass	4.41
37	Mangere / Massey	EASTBOUND	6.44	10.6	14.2	18.5	10.9	-0.2	-3.2	Low	Pass	3.25
37	Mangere / Massey	WESTBOUND	6.44	8.7	13.2	20.5	11.0	-0.2	-2.2	Low	Pass	2.69
39	Constellation Drive	EASTBOUND	1.37	2.1	3.4	5.8	3.1	-0.1	-0.3	Pass	Pass	0.33
39	Constellation Drive	WESTBOUND	1.37	2.8	3.9	5.4	2.9	-0.2	-0.9	Pass	Pass	0.94
40	East Coast / Forrest Hill	NORTHBOUND	10.79	13.6	16.3	26.0	16.0	0.0	-0.3	Pass	Pass	2.26
40	East Coast / Forrest Hill	SOUTHBOUND	10.79	16.8	25.8	41.7	17.4	-0.3	-8.5	Low	Pass	8.50
42	Esmonde Road / Lake Road	NORTHBOUND	5.69	8.9	23.6	34.4	14.2	-0.4	-9.3	Low	Pass	9.30
42	Esmonde Road / Lake Road	SOUTHBOUND	5.69	9.2	14.8	19.5	9.1	-0.4	-5.7	Low	Low	6.02
46	Great South Road	NORTHBOUND	9.74	18.6	31.5	48.4	19.1	-0.4	-12.4	Low	Pass	12.45
46	Great South Road	SOUTHBOUND	9.74	13.5	19.1	24.8	17.9	-0.1	-1.2	Pass	Pass	3.61
47	Te Atatu / Edmonton Roads	NORTHBOUND	6.49	11.5	23.0	38.5	19.2	-0.2	-3.8	Low	Pass	15.89
47	Te Atatu / Edmonton Roads	SOUTHBOUND	6.49	8.8	11.9	15.5	11.9	0.0	0.0	Pass	Pass	3.74
48	Oteha Valley Road	EASTBOUND	3.41	4.2	5.0	5.8	5.0	0.0	0.0	Pass	Pass	0.05
48	Oteha Valley Road	WESTBOUND	3.41	4.1	5.0	6.7	5.2	0.1	0.3	Pass	Pass	0.25
49	Te Irirangi Road	NORTHBOUND	10.50	11.0	16.0	25.0	16.0	0.0	0.0	Pass	Pass	3.80
49	Te Irirangi Road	SOUTHBOUND	10.50	13.2	20.8	32.8	17.8	-0.1	-3.0	Pass	Pass	5.23
51	Great North Road	EASTBOUND	15.69	27.6	40.3	55.1	32.3	-0.2	-8.0	Low	Pass	11.90
51	Great North Road	WESTBOUND	15.69	21.7	26.9	39.4	30.3	0.1	3.4	Pass	Pass	5.29
54	Dominion Road	NORTHBOUND	6.08	8.3	14.8	40.7	13.0	-0.1	-1.8	Pass	Pass	3.80
54	Dominion Road	SOUTHBOUND	6.08	8.4	13.5	22.4	10.1	-0.3	-3.4	Low	Pass	3.54
55	Ellerslie Panmure / Ti Raukau Drive	WESTBOUND	14.02	24.3	42.5	66.4	41.8	0.0	-0.6	Pass	Pass	17.14
55	Ellerslie Panmure / Ti Raukau Drive	EASTBOUND	14.02	18.2	27.2	48.6	23.3	-0.1	-3.9	Pass	Pass	4.10
56	Tamaki Drive	EASTBOUND	5.85	7.0	8.3	9.7	7.0	-0.2	-1.3	Low	Pass	1.28
56	Tamaki Drive	WESTBOUND	5.85	7.7	11.8	17.0	7.6	-0.4	-4.3	Low	Low	4.26
58	East Tamaki / Springs Roads	NORTHBOUND	4.82	8.1	10.3	13.0	8.7	-0.2	-1.6	Low	Pass	1.65
58	East Tamaki / Springs Roads	SOUTHBOUND	4.82	7.7	8.8	10.0	15.5	0.8	6.6	High	High	6.63

Route ID	Route Name	direction	Length	AM-Obs 15th Percentile	AM-Obs Observed Mean	AM-Obs 85th Percentile	AM-modelled	% Diff	Abs Diff	Within 15% or 1 min	Within 15th/85th	+ Abs Diff
59	Blockhouse Bay Road	NORTHBOUND	4.11	9.2	15.0	19.6	9.1	-0.4	-5.9	Low	Low	6.61
59	Blockhouse Bay Road	SOUTHBOUND	4.11	9.0	11.9	14.8	7.1	-0.4	-4.8	Low	Low	4.78
60	Hillsborough / Godley Roads	EASTBOUND	11.45	17.7	25.7	34.9	21.1	-0.2	-4.5	Low	Pass	8.45
60	Hillsborough / Godley Roads	WESTBOUND	11.45	13.8	16.4	31.8	15.4	-0.1	-1.0	Pass	Pass	1.37
61	Roscommon / Weymouth Roads	NORTHBOUND	7.13	9.4	12.9	16.6	11.0	-0.1	-1.8	Pass	Pass	2.14
61	Roscommon / Weymouth Roads	SOUTHBOUND	7.13	8.2	10.2	12.3	9.6	-0.1	-0.6	Pass	Pass	0.60
62	Whangaparaoa Road	EASTBOUND	16.22	17.5	21.0	25.8	20.0	0.0	-0.9	Pass	Pass	1.49
62	Whangaparaoa Road	WESTBOUND	16.22	19.0	24.0	30.1	24.9	0.0	0.9	Pass	Pass	6.48
66	Greville Road	EASTBOUND	1.12	1.5	2.6	3.5	1.7	-0.3	-0.9	Pass	Pass	0.90
66	Greville Road	WESTBOUND	1.12	1.3	2.3	6.9	1.6	-0.3	-0.6	Pass	Pass	0.94
68	Mt Albert / Mt Smart / Mays	WESTBOUND	10.97	18.4	27.0	40.4	21.4	-0.2	-5.6	Low	Pass	5.95
68	Mt Albert / Mt Smart / Mays	EASTBOUND	10.97	17.2	25.4	36.5	20.6	-0.2	-4.7	Low	Pass	5.73
67	Wiri Station / Mill Roads	WESTBOUND	14.50	26.3	33.6	42.3	28.3	-0.2	-5.3	Low	Pass	6.04
67	Wiri Station / Mill Roads	EASTBOUND	14.50	14.7	19.8	27.5	15.4	-0.2	-4.4	Low	Pass	4.41
83	Hibiscus Coast Highway	NORTHBOUND	6.48	7.6	9.7	12.4	0.0					
83	Hibiscus Coast Highway	SOUTHBOUND	6.48	7.4	9.5	12.0	9.0	-0.1	-0.5	Pass	Pass	0.89
85	Kitchener / Hurstmere	NORTHBOUND	5.46	7.7	9.5	12.4	7.7	-0.2	-1.8	Low	Pass	1.78
85	Kitchener / Hurstmere	SOUTHBOUND	5.46	7.7	11.1	14.8	9.7	-0.1	-1.4	Pass	Pass	1.74
86	Kaipatiki / Birkdale / Mokoia	NORTHBOUND	5.60	7.3	8.4	9.7	7.5	-0.1	-0.9	Pass	Pass	0.86
86	Kaipatiki / Birkdale / Mokoia	SOUTHBOUND	5.60	7.2	9.2	10.9	12.6	0.4	3.5	High	High	6.10
95	Newton / Kyber Pass	WESTBOUND	2.54	4.9	9.7	17.0	6.3	-0.4	-3.4	Low	Pass	3.41
95	Newton / Kyber Pass	EASTBOUND	2.54	4.4	8.5	15.4	6.9	-0.2	-1.6	Low	Pass	1.63
108	Puhinui Rd	EASTBOUND	11.45	14.0	17.9	22.8	18.7	0.0	0.9	Pass	Pass	3.64
108	Puhinui Rd	WESTBOUND	11.45	16.7	20.6	26.3	16.9	-0.2	-3.7	Low	Pass	5.69
116	Northcote / Ocean View / Pupuke	EASTBOUND	3.51	4.9	18.4	48.3	8.3	-0.5	-10.0	Low	Pass	10.02
116	Northcote / Ocean View / Pupuke	WESTBOUND	3.51	5.4	9.7	15.1	12.3	0.3	2.6	High	Pass	7.00
120	Parnell / Broadway	NORTHBOUND	3.15	6.4	9.6	20.4	8.1	-0.2	-1.5	Low	Pass	1.77
120	Parnell / Broadway	SOUTHBOUND	3.15	5.0	9.0	12.6	8.3	-0.1	-0.6	Pass	Pass	1.91
126	Northern Motorway Northbound	NORTHBOUND	28.11	17.6	19.5	21.6	20.7	0.1	1.2	Pass	Pass	2.57
127	Upper Harbour Motorway Westbound	WESTBOUND	13.20	8.4	10.6	13.1	10.4	0.0	-0.3	Pass	Pass	2.36
128	Upper Harbour Motorway Eastbound	EASTBOUND	13.25	9.4	17.1	31.0	11.4	-0.3	-5.6	Low	Pass	7.07
129	Southern Motorway Southbound	SOUTHBOUND	35.42	22.5	25.9	29.9	30.5	0.2	4.6	High	High	6.76
130	Southern Motorway Northbound	NORTHBOUND	35.24	52.9	81.7	112.3	43.6	-0.5	-38.1	Low	Low	54.62
131	Northern Motorway Southbound	SOUTHBOUND	28.65	42.6	54.4	71.3	43.8	-0.2	-10.6	Low	Pass	32.97
52	Manukau Road	NORTHBOUND	9.21	13.7	27.0	43.0	23.0	-0.1	-4.0	Pass	Pass	14.21
92	New North Rd	EASTBOUND	7.05	12.3	24.7	38.0	17.9	-0.3	-6.8	Low	Pass	8.68
92	New North Rd	WESTBOUND	7.05	9.0	14.4	22.0	12.0	-0.2	-2.4	Low	Pass	2.73
142	SH20A Southbound	SOUTHBOUND	5.41	5.3	7.0	8.8	6.7	0.0	-0.3	Pass	Pass	0.59
143	SH20A Northbound	NORTHBOUND	5.43	5.1	6.8	8.5	6.2	-0.1	-0.6	Pass	Pass	0.64
144	Albany Expressway	WESTBOUND	1.95	1.9	3.3	5.5	3.3	0.0	-0.1	Pass	Pass	1.49
144	Albany Expressway	EASTBOUND	1.95	1.9	3.5	5.5	2.9	-0.2	-0.6	Pass	Pass	0.66
153	Te Atatu Rd South	NORTHBOUND	2.44	2.8	4.3	7.4	5.6	0.3	1.3	High	Pass	1.56
153	Te Atatu Rd South	SOUTHBOUND	2.44	3.1	3.9	5.0	3.5	-0.1	-0.4	Pass	Pass	0.43
171	Northwestern Motorway Westbound	WESTBOUND	23.83	17.4	21.7	28.5	21.1	0.0	-0.6	Pass	Pass	4.08
172	Northwestern Motorway Eastbound	EASTBOUND	23.83	33.3	56.4	84.3	36.3	-0.4	-20.1	Low	Pass	27.13
138	SH20 Southbound	SOUTHBOUND	20.34	12.8	14.6	16.4	16.5	0.1	1.9	Pass	High	3.35
139	SH20 Northbound	NORTHBOUND	20.24	14.5	20.4	29.0	17.2	-0.2	-3.2	Low	Pass	6.18
184	New North Rd/Symonds St	WESTBOUND	0.77	1.1	2.2	3.0	1.6	-0.3	-0.6	Pass	Pass	0.56
184	New North Rd/Symonds St	EASTBOUND	0.77	1.2	1.9	3.1	3.3	0.7	1.4	High	High	1.35
53	Manukau Road	SOUTHBOUND	9.22	13.3	29.0	58.0	17.7	-0.4	-11.3	Low	Pass	17.33

AM 8am – 9am

Route ID	Route Name	direction	Length	AM-Obs 15th Percentile	AM-Obs Observed Mean	AM-Obs 85th Percentile	AM-modelled	% Diff	Abs Diff	Within 15% or 1 min	Within 15th/85th	+ Abs Diff
12	Albany Hwy	NORTHBOUND	11.13	17.8	32.9	53.6	19.3	-0.4	-13.6	Low	Pass	13.70
12	Albany Hwy	SOUTHBOUND	11.13	25.0	37.3	57.5	25.1	-0.3	-12.1	Low	Pass	20.97
17	Freight - Neilson	EASTBOUND	5.45	9.7	15.8	22.6	11.7	-0.3	-4.1	Low	Pass	4.16
17	Freight - Neilson	WESTBOUND	5.45	7.2	11.8	16.9	8.7	-0.3	-3.1	Low	Pass	3.07
18	Freight - Highbrook	EASTBOUND	6.12	6.8	10.1	14.1	10.5	0.0	0.4	Pass	Pass	1.66
18	Freight - Highbrook	WESTBOUND	6.12	6.2	8.6	12.1	22.7	1.6	14.1	High	High	15.24
23	Balmoral Road	WESTBOUND	13.52	23.2	48.7	80.9	27.8	-0.4	-20.9	Low	Pass	21.15
23	Balmoral Road	EASTBOUND	13.52	24.4	40.9	59.2	29.8	-0.3	-11.2	Low	Pass	14.67
32	Freight - SEART	WESTBOUND	6.30	12.1	17.3	24.0	23.0	0.3	5.7	High	Pass	9.50
32	Freight - SEART	EASTBOUND	6.30	6.6	10.8	16.4	9.3	-0.1	-1.5	Pass	Pass	1.47
33	Mt Wellington Highway / Great South	NORTHBOUND	24.95	41.3	71.4	127.3	50.9	-0.3	-20.4	Low	Pass	28.10
33	Mt Wellington Highway / Great South	SOUTHBOUND	24.95	35.8	47.4	68.2	40.2	-0.2	-7.2	Low	Pass	7.93
34	Inner Eastern	NORTHBOUND	18.59	33.1	50.5	78.3	35.1	-0.3	-15.4	Low	Pass	16.94
34	Inner Eastern	SOUTHBOUND	18.59	29.1	40.7	55.2	35.9	-0.1	-4.8	Pass	Pass	6.21
35	Lincoln Road	NORTHBOUND	3.05	5.1	12.0	20.5	10.3	-0.1	-1.6	Pass	Pass	2.92
35	Lincoln Road	SOUTHBOUND	3.05	4.4	8.0	12.1	5.9	-0.3	-2.1	Low	Pass	2.24
36	Onewa Road	WESTBOUND	2.24	3.5	4.8	6.7	5.0	0.0	0.1	Pass	Pass	0.16
36	Onewa Road	EASTBOUND	2.24	4.1	8.6	12.5	18.6	1.2	10.1	High	High	11.32
37	Mangere / Massey	EASTBOUND	6.44	11.2	15.7	22.9	11.1	-0.3	-4.6	Low	Low	4.65
37	Mangere / Massey	WESTBOUND	6.44	10.8	18.2	27.7	11.1	-0.4	-7.1	Low	Pass	7.12
39	Constellation Drive	EASTBOUND	1.37	2.5	4.9	6.8	3.9	-0.2	-0.9	Pass	Pass	0.94
39	Constellation Drive	WESTBOUND	1.37	2.7	4.9	8.0	2.6	-0.5	-2.3	Low	Low	2.33
40	East Coast / Forrest Hill	NORTHBOUND	10.79	16.1	21.2	37.0	16.1	-0.2	-5.2	Low	Low	5.41
40	East Coast / Forrest Hill	SOUTHBOUND	10.79	15.9	29.9	51.9	18.0	-0.4	-12.0	Low	Pass	12.02
42	Esmonde Road / Lake Road	NORTHBOUND	5.69	9.5	26.9	45.4	20.4	-0.2	-6.5	Low	Pass	13.30
42	Esmonde Road / Lake Road	SOUTHBOUND	5.69	7.6	10.2	13.1	9.7	-0.1	-0.5	Pass	Pass	0.98
46	Great South Road	NORTHBOUND	9.74	20.4	38.2	60.5	19.8	-0.5	-18.4	Low	Low	18.41
46	Great South Road	SOUTHBOUND	9.74	14.1	21.1	29.6	18.1	-0.1	-3.0	Pass	Pass	3.99
47	Te Atatu / Edmonton Roads	NORTHBOUND	6.49	9.5	15.6	24.2	16.2	0.0	0.5	Pass	Pass	7.54
47	Te Atatu / Edmonton Roads	SOUTHBOUND	6.49	11.1	16.2	23.7	11.2	-0.3	-5.0	Low	Pass	6.10
48	Oteha Valley Road	EASTBOUND	3.41	4.1	4.7	5.9	4.8	0.0	0.1	Pass	Pass	0.29
48	Oteha Valley Road	WESTBOUND	3.41	4.1	5.2	11.0	5.1	0.0	-0.1	Pass	Pass	0.15
49	Te Irirangi Road	NORTHBOUND	10.50	12.7	22.1	35.0	17.1	-0.2	-5.0	Low	Pass	5.92
49	Te Irirangi Road	SOUTHBOUND	10.50	11.9	23.2	38.8	21.1	-0.1	-2.1	Pass	Pass	9.81
51	Great North Road	EASTBOUND	15.69	26.4	44.2	64.8	32.6	-0.3	-11.5	Low	Pass	11.54
51	Great North Road	WESTBOUND	15.69	23.1	37.2	60.8	31.3	-0.2	-5.9	Low	Pass	10.79
54	Dominion Road	NORTHBOUND	6.08	12.8	22.9	44.6	14.5	-0.4	-8.4	Low	Pass	8.37
54	Dominion Road	SOUTHBOUND	6.08	8.9	14.5	22.5	10.2	-0.3	-4.3	Low	Pass	4.26
55	Ellerslie Panmure / Ti Raukau Drive	WESTBOUND	14.02	28.6	49.0	78.3	42.1	-0.1	-6.9	Pass	Pass	18.14
55	Ellerslie Panmure / Ti Raukau Drive	EASTBOUND	14.02	18.4	32.2	46.5	26.0	-0.2	-6.2	Low	Pass	6.16
56	Tamaki Drive	EASTBOUND	5.85	6.9	8.6	10.2	7.1	-0.2	-1.4	Low	Pass	1.44
56	Tamaki Drive	WESTBOUND	5.85	8.0	14.0	21.6	7.5	-0.5	-6.6	Low	Low	6.57
58	East Tamaki / Springs Roads	NORTHBOUND	4.82	8.9	11.3	13.8	9.0	-0.2	-2.3	Low	Pass	2.32
58	East Tamaki / Springs Roads	SOUTHBOUND	4.82	8.5	13.0	20.2	15.3	0.2	2.3	High	Pass	2.33
59	Blockhouse Bay Road	NORTHBOUND	4.11	8.5	11.7	33.1	8.3	-0.3	-3.3	Low	Low	3.69
59	Blockhouse Bay Road	SOUTHBOUND	4.11	7.2	8.8	10.9	7.3	-0.2	-1.5	Low	Pass	1.50
60	Hillsborough / Godley Roads	EASTBOUND	11.45	19.5	31.8	45.4	21.5	-0.3	-10.3	Low	Pass	10.68
60	Hillsborough / Godley Roads	WESTBOUND	11.45	14.5	18.6	27.2	15.9	-0.1	-2.7	Pass	Pass	2.72
61	Roscommon / Weymouth Roads	NORTHBOUND	7.13	9.6	12.8	17.0	10.8	-0.2	-2.0	Low	Pass	2.22

Route ID	Route Name	direction	Length	AM-Obs 15th Percentile	AM-Obs Observed Mean	AM-Obs 85th Percentile	AM-modelled	% Diff	Abs Diff	Within 15% or 1 min	Within 15th/85th	+ Abs Diff
61	Roscommon / Weymouth Roads	SOUTHBOUND	7.13	9.4	12.8	15.8	9.5	-0.3	-3.3	Low	Pass	3.38
62	Whangaparaoa Road	EASTBOUND	16.22	17.6	21.4	25.4	20.3	0.0	-1.0	Pass	Pass	1.88
62	Whangaparaoa Road	WESTBOUND	16.22	18.4	22.3	26.7	23.6	0.1	1.4	Pass	Pass	2.26
66	Greville Road	EASTBOUND	1.12	1.3	3.6	6.0	2.0	-0.4	-1.6	Low	Pass	1.62
66	Greville Road	WESTBOUND	1.12	1.5	3.3	7.3	1.6	-0.5	-1.7	Low	Pass	1.78
68	Mt Albert / Mt Smart / Mays	WESTBOUND	10.97	18.5	34.3	49.8	22.4	-0.3	-11.9	Low	Pass	11.92
68	Mt Albert / Mt Smart / Mays	EASTBOUND	10.97	17.6	31.6	48.0	21.5	-0.3	-10.1	Low	Pass	10.42
67	Wiri Station / Mill Roads	WESTBOUND	14.50	16.7	28.0	41.4	33.6	0.2	5.6	High	Pass	12.29
67	Wiri Station / Mill Roads	EASTBOUND	14.50	16.2	20.2	24.6	16.0	-0.2	-4.2	Low	Low	4.60
83	Hibiscus Coast Highway	NORTHBOUND	6.48	7.7	9.1	16.9	0.0					
83	Hibiscus Coast Highway	SOUTHBOUND	6.48	7.5	9.9	12.4	9.1	-0.1	-0.8	Pass	Pass	0.79
85	Kitchener / Hurstmere	NORTHBOUND	5.46	7.8	10.3	12.8	8.9	-0.1	-1.4	Pass	Pass	3.07
85	Kitchener / Hurstmere	SOUTHBOUND	5.46	8.5	14.7	28.5	8.8	-0.4	-5.9	Low	Pass	5.92
86	Kaipatiki / Birkdale / Mokoia	NORTHBOUND	5.60	7.9	12.0	20.2	7.6	-0.4	-4.4	Low	Low	4.39
86	Kaipatiki / Birkdale / Mokoia	SOUTHBOUND	5.60	8.8	13.4	23.1	11.4	-0.1	-1.9	Pass	Pass	3.80
95	Newton / Kyber Pass	WESTBOUND	2.54	4.4	10.6	18.4	7.0	-0.3	-3.6	Low	Pass	3.57
95	Newton / Kyber Pass	EASTBOUND	2.54	5.7	10.3	17.6	7.3	-0.3	-3.0	Low	Pass	3.24
108	Puhinui Rd	EASTBOUND	11.45	14.7	19.4	23.7	19.0	0.0	-0.4	Pass	Pass	3.70
108	Puhinui Rd	WESTBOUND	11.45	15.5	23.8	31.9	21.9	-0.1	-1.9	Pass	Pass	8.37
116	Northcote / Ocean View / Pupuke	EASTBOUND	3.51	15.5	21.4	32.5	8.4	-0.6	-12.9	Low	Low	14.53
116	Northcote / Ocean View / Pupuke	WESTBOUND	3.51	5.2	9.6	14.8	14.1	0.5	4.5	High	Pass	7.05
120	Parnell / Broadway	NORTHBOUND	3.15	7.4	15.2	30.3	8.3	-0.5	-7.0	Low	Pass	6.96
120	Parnell / Broadway	SOUTHBOUND	3.15	6.5	12.3	21.4	8.7	-0.3	-3.5	Low	Pass	4.54
126	Northern Motorway Northbound	NORTHBOUND	28.11	17.8	20.2	23.0	20.8	0.0	0.5	Pass	Pass	3.10
127	Upper Harbour Motorway Westbound	WESTBOUND	13.20	8.7	11.2	13.8	10.3	-0.1	-0.8	Pass	Pass	2.41
128	Upper Harbour Motorway Eastbound	EASTBOUND	13.25	10.6	22.6	36.8	11.3	-0.5	-11.3	Low	Pass	12.77
129	Southern Motorway Southbound	SOUTHBOUND	35.42	22.7	26.9	31.8	31.2	0.2	4.2	High	Pass	8.10
130	Southern Motorway Northbound	NORTHBOUND	35.24	42.7	73.0	106.2	49.9	-0.3	-23.0	Low	Pass	57.82
131	Northern Motorway Southbound	SOUTHBOUND	28.65	32.3	47.8	66.2	49.0	0.0	1.3	Pass	Pass	32.70
52	Manukau Road	NORTHBOUND	9.21	16.8	42.2	67.6	25.1	-0.4	-17.1	Low	Pass	26.29
92	New North Rd	EASTBOUND	7.05	13.5	27.3	44.6	18.4	-0.3	-8.9	Low	Pass	8.86
92	New North Rd	WESTBOUND	7.05	9.5	16.3	27.0	12.8	-0.2	-3.6	Low	Pass	4.31
142	SH20A Southbound	SOUTHBOUND	5.41	5.1	7.4	10.1	6.7	-0.1	-0.7	Pass	Pass	0.94
143	SH20A Northbound	NORTHBOUND	5.43	5.2	6.8	8.7	6.2	-0.1	-0.6	Pass	Pass	0.66
144	Albany Expressway	WESTBOUND	1.95	2.2	3.8	5.8	3.1	-0.2	-0.7	Pass	Pass	0.77
144	Albany Expressway	EASTBOUND	1.95	2.1	5.1	9.2	3.6	-0.3	-1.5	Low	Pass	1.49
153	Te Atatu Rd South	NORTHBOUND	2.44	3.8	6.1	8.6	5.1	-0.2	-0.9	Pass	Pass	1.29
153	Te Atatu Rd South	SOUTHBOUND	2.44	3.2	4.4	6.8	3.5	-0.2	-0.9	Pass	Pass	0.92
171	Northwestern Motorway Westbound	WESTBOUND	23.83	18.7	24.2	28.9	21.0	-0.1	-3.1	Pass	Pass	7.04
172	Northwestern Motorway Eastbound	EASTBOUND	23.83	25.3	53.6	87.1	43.2	-0.2	-10.4	Low	Pass	34.01
138	SH20 Southbound	SOUTHBOUND	20.34	12.9	15.6	18.6	17.0	0.1	1.4	Pass	Pass	3.25
139	SH20 Northbound	NORTHBOUND	20.24	13.5	19.5	28.7	18.3	-0.1	-1.3	Pass	Pass	5.73
184	New North Rd/Symonds St	WESTBOUND	0.77	1.1	3.1	4.9	2.8	-0.1	-0.3	Pass	Pass	0.29
184	New North Rd/Symonds St	EASTBOUND	0.77	1.0	1.6	2.7	2.9	0.9	1.4	High	High	1.36
53	Manukau Road	SOUTHBOUND	9.22	24.5	32.3	41.8	20.0	-0.4	-12.3	Low	Low	18.08

IP 11am – 12pm

Route ID	Route Name	direction	Length	IP-Obs 15th Percentile	IP-Obs Observed Mean	IP-Obs 85th Percentile	IP-modelled	% Diff	Abs Diff	Within 15% or 1 min	Within 15th/85th	+ Abs Diff
12	Albany Hwy	NORTHBOUND	11.13	15.6	19.8	25.4	17.1	-0.1	-2.7	Pass	Pass	4.15
12	Albany Hwy	SOUTHBOUND	11.13	15.5	19.7	24.8	17.3	-0.1	-2.5	Pass	Pass	4.32
17	Freight - Neilson	EASTBOUND	5.45	8.1	13.7	19.6	9.6	-0.3	-4.1	Low	Pass	4.25
17	Freight - Neilson	WESTBOUND	5.45	6.9	11.3	16.8	8.4	-0.3	-2.9	Low	Pass	2.95
18	Freight - Highbrook	EASTBOUND	6.12	6.6	9.0	11.7	8.2	-0.1	-0.8	Pass	Pass	1.41
18	Freight - Highbrook	WESTBOUND	6.12	6.0	8.0	10.2	7.8	0.0	-0.2	Pass	Pass	0.78
23	Balmoral Road	WESTBOUND	13.52	18.9	28.3	41.0	25.1	-0.1	-3.1	Pass	Pass	5.41
23	Balmoral Road	EASTBOUND	13.52	20.0	27.1	34.8	24.1	-0.1	-2.9	Pass	Pass	4.06
32	Freight - SEART	WESTBOUND	6.30	6.2	8.1	9.8	7.3	-0.1	-0.8	Pass	Pass	1.06
32	Freight - SEART	EASTBOUND	6.30	6.2	8.8	11.7	8.6	0.0	-0.3	Pass	Pass	0.65
33	Mt Wellington Highway / Great South	NORTHBOUND	24.95	35.9	49.0	109.4	39.5	-0.2	-9.5	Low	Pass	9.45
33	Mt Wellington Highway / Great South	SOUTHBOUND	24.95	35.2	47.1	79.1	38.3	-0.2	-8.8	Low	Pass	9.84
34	Inner Eastern	NORTHBOUND	18.59	25.6	36.3	49.6	30.2	-0.2	-6.2	Low	Pass	6.89
34	Inner Eastern	SOUTHBOUND	18.59	25.7	34.5	44.9	31.0	-0.1	-3.5	Pass	Pass	4.69
35	Lincoln Road	NORTHBOUND	3.05	4.9	7.8	13.2	5.7	-0.3	-2.1	Low	Pass	2.07
35	Lincoln Road	SOUTHBOUND	3.05	4.4	7.2	10.9	5.4	-0.2	-1.8	Low	Pass	1.79
36	Onewa Road	WESTBOUND	2.24	2.8	4.0	6.2	4.0	0.0	0.0	Pass	Pass	0.30
36	Onewa Road	EASTBOUND	2.24	2.7	3.5	4.5	3.5	0.0	0.1	Pass	Pass	0.14
37	Mangere / Massey	EASTBOUND	6.44	9.0	12.0	14.8	9.5	-0.2	-2.5	Low	Pass	2.52
37	Mangere / Massey	WESTBOUND	6.44	8.1	11.2	15.6	9.3	-0.2	-1.9	Low	Pass	1.92
39	Constellation Drive	EASTBOUND	1.37	1.8	2.5	3.3	2.7	0.1	0.2	Pass	Pass	0.17
39	Constellation Drive	WESTBOUND	1.37	3.3	4.2	5.8	2.6	-0.4	-1.6	Low	Low	1.56
40	East Coast / Forrest Hill	NORTHBOUND	10.79	13.6	17.1	30.2	15.4	-0.1	-1.7	Pass	Pass	1.87
40	East Coast / Forrest Hill	SOUTHBOUND	10.79	12.7	17.6	46.1	15.5	-0.1	-2.1	Pass	Pass	2.36
42	Esmonde Road / Lake Road	NORTHBOUND	5.69	7.5	10.0	15.4	8.6	-0.1	-1.4	Pass	Pass	1.36
42	Esmonde Road / Lake Road	SOUTHBOUND	5.69	7.5	10.2	12.9	8.8	-0.1	-1.3	Pass	Pass	1.42
46	Great South Road	NORTHBOUND	9.74	14.2	21.3	28.7	17.1	-0.2	-4.2	Low	Pass	4.23
46	Great South Road	SOUTHBOUND	9.74	13.9	19.9	27.5	16.5	-0.2	-3.5	Low	Pass	3.48
47	Te Atatu / Edmonton Roads	NORTHBOUND	6.49	9.3	14.5	22.8	10.2	-0.3	-4.3	Low	Pass	4.60
47	Te Atatu / Edmonton Roads	SOUTHBOUND	6.49	8.7	11.4	15.8	10.2	-0.1	-1.1	Pass	Pass	2.28
48	Oteha Valley Road	EASTBOUND	3.41	4.0	5.0	6.8	4.6	-0.1	-0.4	Pass	Pass	0.44
48	Oteha Valley Road	WESTBOUND	3.41	3.9	4.9	6.3	5.0	0.0	0.1	Pass	Pass	0.27
49	Te Irirangi Road	NORTHBOUND	10.50	12.2	17.8	26.8	15.0	-0.2	-2.8	Low	Pass	3.10
49	Te Irirangi Road	SOUTHBOUND	10.50	11.7	16.9	24.3	15.4	-0.1	-1.6	Pass	Pass	2.99
51	Great North Road	EASTBOUND	15.69	21.6	29.1	51.2	0.0					
51	Great North Road	WESTBOUND	15.69	22.5	27.6	40.0	28.2	0.0	0.6	Pass	Pass	3.14
54	Dominion Road	NORTHBOUND	6.08	9.0	12.5	23.5	10.1	-0.2	-2.4	Low	Pass	2.41
54	Dominion Road	SOUTHBOUND	6.08	8.8	12.7	19.9	10.3	-0.2	-2.3	Low	Pass	2.30
55	Ellerslie Panmure / Ti Raukau Drive	WESTBOUND	14.02	16.1	21.7	29.3	20.4	-0.1	-1.2	Pass	Pass	2.24
55	Ellerslie Panmure / Ti Raukau Drive	EASTBOUND	14.02	17.4	22.3	28.7	20.6	-0.1	-1.7	Pass	Pass	2.32
56	Tamaki Drive	EASTBOUND	5.85	7.6	8.5	9.8	7.2	-0.2	-1.3	Low	Low	1.32
56	Tamaki Drive	WESTBOUND	5.85	7.7	9.2	24.0	7.2	-0.2	-2.0	Low	Low	2.04
58	East Tamaki / Springs Roads	NORTHBOUND	4.82	7.0	8.8	11.6	7.9	-0.1	-0.8	Pass	Pass	0.84
58	East Tamaki / Springs Roads	SOUTHBOUND	4.82	6.5	8.5	12.2	8.2	0.0	-0.3	Pass	Pass	0.28
59	Blockhouse Bay Road	NORTHBOUND	4.11	7.8	9.3	27.6	6.9	-0.3	-2.4	Low	Low	2.36
59	Blockhouse Bay Road	SOUTHBOUND	4.11	5.9	7.3	17.4	6.8	-0.1	-0.5	Pass	Pass	0.50
60	Hillsborough / Godley Roads	EASTBOUND	11.45	13.4	15.8	20.2	15.3	0.0	-0.5	Pass	Pass	1.62
60	Hillsborough / Godley Roads	WESTBOUND	11.45	13.6	16.5	22.5	15.1	-0.1	-1.4	Pass	Pass	1.69
61	Roscommon / Weymouth Roads	NORTHBOUND	7.13	8.8	10.5	12.5	9.8	-0.1	-0.7	Pass	Pass	0.85

Route ID	Route Name	direction	Length	IP-Obs 15th Percentile	IP-Obs Observed Mean	IP-Obs 85th Percentile	IP-modelled	% Diff	Abs Diff	Within 15% or 1 min	Within 15th/85th	+ Abs Diff
61	Roscommon / Weymouth Roads	SOUTHBOUND	7.13	8.8	10.2	22.6	9.5	-0.1	-0.7	Pass	Pass	1.44
62	Whangaparaoa Road	EASTBOUND	16.22	17.7	20.3	25.1	19.9	0.0	-0.4	Pass	Pass	1.61
62	Whangaparaoa Road	WESTBOUND	16.22	18.0	22.3	27.9	19.9	-0.1	-2.4	Pass	Pass	2.40
66	Greville Road	EASTBOUND	1.12	1.2	1.8	2.7	1.8	0.0	-0.1	Pass	Pass	0.14
66	Greville Road	WESTBOUND	1.12	1.1	1.5	2.2	1.4	0.0	-0.1	Pass	Pass	0.14
68	Mt Albert / Mt Smart / Mays	WESTBOUND	10.97	16.1	22.0	29.3	18.9	-0.1	-3.0	Pass	Pass	3.09
68	Mt Albert / Mt Smart / Mays	EASTBOUND	10.97	15.2	20.4	27.3	18.0	-0.1	-2.4	Pass	Pass	2.48
67	Wiri Station / Mill Roads	WESTBOUND	14.50	14.9	17.9	22.4	14.4	-0.2	-3.5	Low	Low	4.15
67	Wiri Station / Mill Roads	EASTBOUND	14.50	14.9	18.8	23.2	15.4	-0.2	-3.3	Low	Pass	3.33
83	Hibiscus Coast Highway	NORTHBOUND	6.48	7.6	9.3	13.3	8.7	-0.1	-0.6	Pass	Pass	2.00
83	Hibiscus Coast Highway	SOUTHBOUND	6.48	8.1	9.8	11.9	9.0	-0.1	-0.8	Pass	Pass	0.83
85	Kitchener / Hurstmere	NORTHBOUND	5.46	7.3	9.6	13.3	7.7	-0.2	-1.8	Low	Pass	1.84
85	Kitchener / Hurstmere	SOUTHBOUND	5.46	8.4	9.4	18.2	7.9	-0.2	-1.5	Low	Low	1.64
86	Kaipatiki / Birkdale / Mokoia	NORTHBOUND	5.60	7.2	8.6	13.2	7.3	-0.2	-1.3	Low	Pass	1.33
86	Kaipatiki / Birkdale / Mokoia	SOUTHBOUND	5.60	6.8	8.3	14.7	8.1	0.0	-0.2	Pass	Pass	1.65
95	Newton / Kyber Pass	WESTBOUND	2.54	4.0	8.0	13.3	6.0	-0.3	-2.0	Low	Pass	2.36
95	Newton / Kyber Pass	EASTBOUND	2.54	4.7	8.0	11.6	5.6	-0.3	-2.3	Low	Pass	2.53
108	Puhinui Rd	EASTBOUND	11.45	13.5	16.0	19.4	15.6	0.0	-0.4	Pass	Pass	2.00
108	Puhinui Rd	WESTBOUND	11.45	13.1	16.4	20.6	14.6	-0.1	-1.7	Pass	Pass	2.15
116	Northcote / Ocean View / Pupuke	EASTBOUND	3.51	4.4	6.7	9.8	4.8	-0.3	-1.9	Low	Pass	2.08
116	Northcote / Ocean View / Pupuke	WESTBOUND	3.51	4.5	8.1	12.8	5.6	-0.3	-2.5	Low	Pass	2.67
120	Parnell / Broadway	NORTHBOUND	3.15	6.4	10.0	14.7	7.3	-0.3	-2.6	Low	Pass	2.65
120	Parnell / Broadway	SOUTHBOUND	3.15	6.1	10.8	17.0	7.7	-0.3	-3.1	Low	Pass	3.17
126	Northern Motorway Northbound	NORTHBOUND	28.11	17.3	19.0	20.9	21.0	0.1	2.0	Pass	High	2.68
127	Upper Harbour Motorway Westbound	WESTBOUND	13.20	8.4	9.8	11.6	10.2	0.0	0.3	Pass	Pass	1.50
128	Upper Harbour Motorway Eastbound	EASTBOUND	13.25	8.6	10.4	12.6	10.6	0.0	0.2	Pass	Pass	1.86
129	Southern Motorway Southbound	SOUTHBOUND	35.42	22.2	25.1	27.9	29.9	0.2	4.8	High	High	5.56
130	Southern Motorway Northbound	NORTHBOUND	35.24	23.2	28.4	34.9	30.6	0.1	2.2	Pass	Pass	7.73
131	Northern Motorway Southbound	SOUTHBOUND	28.65	18.4	21.2	24.3	21.8	0.0	0.6	Pass	Pass	2.92
52	Manukau Road	NORTHBOUND	9.21	13.5	20.4	33.4	17.1	-0.2	-3.2	Low	Pass	5.25
92	New North Rd	EASTBOUND	7.05	10.1	15.1	25.1	13.4	-0.1	-1.7	Pass	Pass	2.69
92	New North Rd	WESTBOUND	7.05	9.8	14.1	23.7	12.0	-0.1	-2.1	Pass	Pass	2.11
142	SH20A Southbound	SOUTHBOUND	5.41	4.7	6.0	7.3	5.9	0.0	-0.1	Pass	Pass	0.56
143	SH20A Northbound	NORTHBOUND	5.43	5.0	6.3	7.8	6.1	0.0	-0.2	Pass	Pass	0.72
144	Albany Expressway	WESTBOUND	1.95	2.2	3.5	4.8	2.9	-0.2	-0.6	Pass	Pass	0.60
144	Albany Expressway	EASTBOUND	1.95	1.9	3.2	4.7	3.9	0.2	0.7	Pass	Pass	1.89
153	Te Atatu Rd South	NORTHBOUND	2.44	3.4	5.5	8.2	3.3	-0.4	-2.2	Low	Low	2.21
153	Te Atatu Rd South	SOUTHBOUND	2.44	3.1	3.6	4.4	3.4	-0.1	-0.3	Pass	Pass	0.38
171	Northwestern Motorway Westbound	WESTBOUND	23.83	17.4	19.6	22.4	20.2	0.0	0.6	Pass	Pass	3.47
172	Northwestern Motorway Eastbound	EASTBOUND	23.83	17.4	20.3	23.5	20.9	0.0	0.6	Pass	Pass	2.73
138	SH20 Southbound	SOUTHBOUND	20.34	12.4	13.7	15.2	15.2	0.1	1.5	Pass	Pass	2.31
139	SH20 Northbound	NORTHBOUND	20.24	12.3	13.6	15.3	15.3	0.1	1.8	Pass	High	2.07
184	New North Rd/Symonds St	WESTBOUND	0.77	1.1	1.8	2.5	1.9	0.1	0.2	Pass	Pass	0.17
184	New North Rd/Symonds St	EASTBOUND	0.77	1.3	1.8	2.4	2.2	0.2	0.3	Pass	Pass	0.34
53	Manukau Road	SOUTHBOUND	9.22	12.2	16.3	21.7	15.5	0.0	-0.7	Pass	Pass	3.94

IP 12pm – 1pm

Route ID	Route Name	direction	Length	IP-Obs 15th Percentile	IP-Obs Observed Mean	IP-Obs 85th Percentile	IP-modelled	% Diff	Abs Diff	Within 15% or 1 min	Within 15th/85th	+ Abs Diff
12	Albany Hwy	NORTHBOUND	11.13	15.5	19.4	24.7	17.2	-0.1	-2.2	Pass	Pass	3.25
12	Albany Hwy	SOUTHBOUND	11.13	15.4	20.0	27.8	17.3	-0.1	-2.7	Pass	Pass	4.35
17	Freight - Neilson	EASTBOUND	5.45	10.0	15.7	23.8	9.3	-0.4	-6.4	Low	Low	6.38
17	Freight - Neilson	WESTBOUND	5.45	7.7	11.3	15.3	8.4	-0.3	-2.9	Low	Pass	2.94
18	Freight - Highbrook	EASTBOUND	6.12	6.6	9.3	12.9	8.5	-0.1	-0.9	Pass	Pass	1.59
18	Freight - Highbrook	WESTBOUND	6.12	6.3	8.6	12.1	8.0	-0.1	-0.7	Pass	Pass	0.91
23	Balmoral Road	WESTBOUND	13.52	19.8	29.4	42.9	24.8	-0.2	-4.6	Low	Pass	5.13
23	Balmoral Road	EASTBOUND	13.52	21.8	29.1	36.9	25.3	-0.1	-3.8	Pass	Pass	4.85
32	Freight - SEART	WESTBOUND	6.30	6.2	8.0	9.8	7.2	-0.1	-0.7	Pass	Pass	0.92
32	Freight - SEART	EASTBOUND	6.30	6.5	9.3	12.0	9.0	0.0	-0.3	Pass	Pass	0.75
33	Mt Wellington Highway / Great South	NORTHBOUND	24.95	35.9	51.3	95.0	40.6	-0.2	-10.7	Low	Pass	10.87
33	Mt Wellington Highway / Great South	SOUTHBOUND	24.95	36.8	47.0	73.0	39.6	-0.2	-7.4	Low	Pass	8.03
34	Inner Eastern	NORTHBOUND	18.59	27.6	38.5	61.0	30.7	-0.2	-7.8	Low	Pass	8.00
34	Inner Eastern	SOUTHBOUND	18.59	28.2	38.6	53.5	31.4	-0.2	-7.2	Low	Pass	7.53
35	Lincoln Road	NORTHBOUND	3.05	4.7	7.7	10.5	5.5	-0.3	-2.2	Low	Pass	2.18
35	Lincoln Road	SOUTHBOUND	3.05	4.5	7.7	11.0	5.4	-0.3	-2.4	Low	Pass	2.37
36	Onewa Road	WESTBOUND	2.24	2.7	3.5	4.6	4.0	0.2	0.5	Pass	Pass	0.53
36	Onewa Road	EASTBOUND	2.24	2.8	3.7	4.4	3.5	0.0	-0.1	Pass	Pass	0.20
37	Mangere / Massey	EASTBOUND	6.44	8.8	11.8	14.7	9.4	-0.2	-2.4	Low	Pass	2.48
37	Mangere / Massey	WESTBOUND	6.44	8.7	11.2	15.9	9.3	-0.2	-1.9	Low	Pass	1.93
39	Constellation Drive	EASTBOUND	1.37	2.4	3.1	3.9	2.9	-0.1	-0.2	Pass	Pass	0.19
39	Constellation Drive	WESTBOUND	1.37	3.5	4.9	7.2	3.1	-0.4	-1.8	Low	Low	1.80
40	East Coast / Forrest Hill	NORTHBOUND	10.79	13.1	16.0	19.4	15.7	0.0	-0.3	Pass	Pass	1.44
40	East Coast / Forrest Hill	SOUTHBOUND	10.79	12.5	15.0	32.8	15.5	0.0	0.4	Pass	Pass	1.13
42	Esmonde Road / Lake Road	NORTHBOUND	5.69	7.6	10.2	14.5	8.5	-0.2	-1.6	Low	Pass	1.60
42	Esmonde Road / Lake Road	SOUTHBOUND	5.69	7.5	9.9	13.4	9.0	-0.1	-0.9	Pass	Pass	1.26
46	Great South Road	NORTHBOUND	9.74	15.6	24.5	35.5	17.7	-0.3	-6.9	Low	Pass	6.88
46	Great South Road	SOUTHBOUND	9.74	14.9	20.4	32.0	16.4	-0.2	-4.0	Low	Pass	3.97
47	Te Atatu / Edmonton Roads	NORTHBOUND	6.49	8.9	13.1	21.8	10.6	-0.2	-2.4	Low	Pass	2.44
47	Te Atatu / Edmonton Roads	SOUTHBOUND	6.49	8.9	12.3	19.4	10.4	-0.2	-1.9	Low	Pass	3.04
48	Oteha Valley Road	EASTBOUND	3.41	3.8	4.8	6.2	4.7	0.0	-0.1	Pass	Pass	0.42
48	Oteha Valley Road	WESTBOUND	3.41	3.9	4.6	5.4	5.1	0.1	0.5	Pass	Pass	0.50
49	Te Irirangi Road	NORTHBOUND	10.50	12.9	19.5	28.8	15.4	-0.2	-4.2	Low	Pass	4.66
49	Te Irirangi Road	SOUTHBOUND	10.50	13.0	18.6	25.2	15.1	-0.2	-3.5	Low	Pass	3.71
51	Great North Road	EASTBOUND	15.69	20.6	26.6	33.3	26.5	0.0	-0.1	Pass	Pass	4.83
51	Great North Road	WESTBOUND	15.69	21.4	27.9	35.3	30.8	0.1	2.9	Pass	Pass	6.33
54	Dominion Road	NORTHBOUND	6.08	9.7	13.7	19.6	10.3	-0.2	-3.4	Low	Pass	3.38
54	Dominion Road	SOUTHBOUND	6.08	8.6	11.9	16.1	10.6	-0.1	-1.2	Pass	Pass	1.24
55	Ellerslie Panmure / Ti Raukau Drive	WESTBOUND	14.02	17.7	22.8	28.9	20.8	-0.1	-2.0	Pass	Pass	3.11
55	Ellerslie Panmure / Ti Raukau Drive	EASTBOUND	14.02	17.6	23.3	31.4	20.9	-0.1	-2.4	Pass	Pass	2.86
56	Tamaki Drive	EASTBOUND	5.85	7.9	9.4	11.4	7.3	-0.2	-2.1	Low	Low	2.10
56	Tamaki Drive	WESTBOUND	5.85	7.6	8.9	10.4	7.4	-0.2	-1.6	Low	Low	1.55
58	East Tamaki / Springs Roads	NORTHBOUND	4.82	7.1	9.1	11.9	8.1	-0.1	-1.0	Pass	Pass	0.97
58	East Tamaki / Springs Roads	SOUTHBOUND	4.82	6.9	9.6	13.0	8.6	-0.1	-1.0	Pass	Pass	0.96
59	Blockhouse Bay Road	NORTHBOUND	4.11	7.9	8.8	11.0	6.9	-0.2	-1.9	Low	Low	1.93
59	Blockhouse Bay Road	SOUTHBOUND	4.11	6.3	7.2	8.2	7.1	0.0	-0.1	Pass	Pass	0.38
60	Hillsborough / Godley Roads	EASTBOUND	11.45	14.7	16.8	20.3	15.5	-0.1	-1.3	Pass	Pass	1.75
60	Hillsborough / Godley Roads	WESTBOUND	11.45	13.5	16.8	23.8	15.4	-0.1	-1.4	Pass	Pass	1.69
61	Roscommon / Weymouth Roads	NORTHBOUND	7.13	8.0	10.5	13.2	9.8	-0.1	-0.6	Pass	Pass	0.85

Route ID	Route Name	direction	Length	IP-Obs 15th Percentile	IP-Obs Observed Mean	IP-Obs 85th Percentile	IP-modelled	% Diff	Abs Diff	Within 15% or 1 min	Within 15th/85th	+ Abs Diff
61	Roscommon / Weymouth Roads	SOUTHBOUND	7.13	8.5	11.9	16.0	9.5	-0.2	-2.4	Low	Pass	2.72
62	Whangaparaoa Road	EASTBOUND	16.22	17.8	21.4	27.2	20.0	-0.1	-1.4	Pass	Pass	2.18
62	Whangaparaoa Road	WESTBOUND	16.22	17.4	19.7	22.4	20.0	0.0	0.3	Pass	Pass	0.72
66	Greville Road	EASTBOUND	1.12	1.1	1.8	2.6	1.8	0.0	0.1	Pass	Pass	0.19
66	Greville Road	WESTBOUND	1.12	1.2	2.0	3.0	1.5	-0.3	-0.5	Pass	Pass	0.56
68	Mt Albert / Mt Smart / Mays	WESTBOUND	10.97	16.5	23.4	30.7	19.6	-0.2	-3.8	Low	Pass	3.79
68	Mt Albert / Mt Smart / Mays	EASTBOUND	10.97	15.5	21.1	27.7	19.0	-0.1	-2.1	Pass	Pass	3.42
67	Wiri Station / Mill Roads	WESTBOUND	14.50	16.7	19.5	27.7	14.7	-0.2	-4.8	Low	Low	4.77
67	Wiri Station / Mill Roads	EASTBOUND	14.50	16.9	18.8	24.8	15.5	-0.2	-3.3	Low	Low	4.49
83	Hibiscus Coast Highway	NORTHBOUND	6.48	8.2	9.9	13.2	8.5	-0.1	-1.4	Pass	Pass	2.63
83	Hibiscus Coast Highway	SOUTHBOUND	6.48	7.7	10.1	13.2	8.7	-0.1	-1.4	Pass	Pass	1.44
85	Kitchener / Hurstmere	NORTHBOUND	5.46	8.1	11.4	18.7	7.8	-0.3	-3.6	Low	Low	3.59
85	Kitchener / Hurstmere	SOUTHBOUND	5.46	7.4	12.8	24.9	8.1	-0.4	-4.7	Low	Pass	4.93
86	Kaipatiki / Birkdale / Mokoia	NORTHBOUND	5.60	7.3	8.6	9.9	7.3	-0.2	-1.3	Low	Pass	1.30
86	Kaipatiki / Birkdale / Mokoia	SOUTHBOUND	5.60	7.3	9.1	12.1	8.0	-0.1	-1.0	Pass	Pass	2.03
95	Newton / Kyber Pass	WESTBOUND	2.54	4.6	9.4	15.3	6.1	-0.4	-3.3	Low	Pass	3.28
95	Newton / Kyber Pass	EASTBOUND	2.54	4.5	8.5	13.1	6.1	-0.3	-2.3	Low	Pass	2.52
108	Puhinui Rd	EASTBOUND	11.45	13.5	16.9	22.9	15.5	-0.1	-1.4	Pass	Pass	2.72
108	Puhinui Rd	WESTBOUND	11.45	14.4	17.9	22.4	14.6	-0.2	-3.2	Low	Pass	3.47
116	Northcote / Ocean View / Pupuke	EASTBOUND	3.51	4.5	7.0	9.7	4.9	-0.3	-2.1	Low	Pass	2.18
116	Northcote / Ocean View / Pupuke	WESTBOUND	3.51	4.9	6.7	9.7	5.7	-0.2	-1.1	Low	Pass	1.23
120	Parnell / Broadway	NORTHBOUND	3.15	7.1	13.1	35.3	7.9	-0.4	-5.2	Low	Pass	5.20
120	Parnell / Broadway	SOUTHBOUND	3.15	6.7	12.0	21.5	7.6	-0.4	-4.5	Low	Pass	4.46
126	Northern Motorway Northbound	NORTHBOUND	28.11	17.1	18.7	20.5	21.0	0.1	2.3	Pass	High	3.05
127	Upper Harbour Motorway Westbound	WESTBOUND	13.20	8.4	9.8	11.8	10.2	0.0	0.4	Pass	Pass	1.47
128	Upper Harbour Motorway Eastbound	EASTBOUND	13.25	8.6	10.6	12.8	10.6	0.0	0.1	Pass	Pass	1.83
129	Southern Motorway Southbound	SOUTHBOUND	35.42	22.2	25.7	29.3	30.9	0.2	5.2	High	High	6.10
130	Southern Motorway Northbound	NORTHBOUND	35.24	23.0	28.1	34.3	30.1	0.1	2.0	Pass	Pass	7.18
131	Northern Motorway Southbound	SOUTHBOUND	28.65	18.3	20.9	23.1	22.0	0.1	1.1	Pass	Pass	3.12
52	Manukau Road	NORTHBOUND	9.21	14.5	21.6	30.6	16.2	-0.3	-5.4	Low	Pass	7.24
92	New North Rd	EASTBOUND	7.05	11.0	17.7	28.3	13.2	-0.3	-4.5	Low	Pass	4.53
92	New North Rd	WESTBOUND	7.05	9.8	14.7	21.3	12.1	-0.2	-2.6	Low	Pass	2.61
142	SH20A Southbound	SOUTHBOUND	5.41	4.9	6.5	8.1	6.3	0.0	-0.2	Pass	Pass	0.53
143	SH20A Northbound	NORTHBOUND	5.43	5.1	6.4	7.9	6.1	-0.1	-0.3	Pass	Pass	0.91
144	Albany Expressway	WESTBOUND	1.95	2.2	3.6	5.4	2.8	-0.2	-0.7	Pass	Pass	0.77
144	Albany Expressway	EASTBOUND	1.95	2.7	3.8	5.4	3.6	0.0	-0.2	Pass	Pass	1.24
153	Te Atatu Rd South	NORTHBOUND	2.44	3.1	6.1	11.8	3.4	-0.4	-2.7	Low	Pass	2.69
153	Te Atatu Rd South	SOUTHBOUND	2.44	2.9	3.6	4.5	3.4	-0.1	-0.2	Pass	Pass	0.40
171	Northwestern Motorway Westbound	WESTBOUND	23.83	17.2	20.0	22.7	20.1	0.0	0.1	Pass	Pass	3.38
172	Northwestern Motorway Eastbound	EASTBOUND	23.83	17.4	20.4	23.5	21.0	0.0	0.6	Pass	Pass	3.18
138	SH20 Southbound	SOUTHBOUND	20.34	12.4	13.6	15.0	15.2	0.1	1.6	Pass	High	2.35
139	SH20 Northbound	NORTHBOUND	20.24	12.3	13.6	15.2	15.5	0.1	1.9	Pass	High	2.15
184	New North Rd/Symonds St	WESTBOUND	0.77	1.4	3.6	6.6	1.9	-0.5	-1.7	Low	Pass	1.66
184	New North Rd/Symonds St	EASTBOUND	0.77	1.3	2.0	2.5	2.4	0.2	0.5	Pass	Pass	0.47
53	Manukau Road	SOUTHBOUND	9.22	12.7	19.3	27.8	16.2	-0.2	-3.0	Low	Pass	6.83

PM 4pm – 5pm

Route ID	Route Name	direction	Length	PM-Obs 15th Percentile	PM-Obs Observed Mean	PM-Obs 85th Percentile	PM-modelled	% Diff	Abs Diff	Within 15% or 1 min	Within 15th/85th	+ Abs Diff
12	Albany Hwy	NORTHBOUND	11.13	18.3	25.5	36.2	20.1	-0.2	-5.3	Low	Pass	6.25
12	Albany Hwy	SOUTHBOUND	11.13	17.2	22.5	30.6	20.0	-0.1	-2.5	Pass	Pass	5.61
17	Freight - Neilson	EASTBOUND	5.45	8.8	17.6	29.2	11.4	-0.4	-6.2	Low	Pass	7.01
17	Freight - Neilson	WESTBOUND	5.45	11.0	19.4	29.1	9.5	-0.5	-9.9	Low	Low	9.93
18	Freight - Highbrook	EASTBOUND	6.12	7.8	11.2	16.3	9.5	-0.2	-1.7	Low	Pass	2.66
18	Freight - Highbrook	WESTBOUND	6.12	8.2	13.7	20.2	8.6	-0.4	-5.1	Low	Pass	5.17
23	Balmoral Road	WESTBOUND	13.52	24.3	37.9	66.3	29.5	-0.2	-8.4	Low	Pass	11.84
23	Balmoral Road	EASTBOUND	13.52	22.1	39.9	72.8	32.6	-0.2	-7.3	Low	Pass	9.29
32	Freight - SEART	WESTBOUND	6.30	6.4	9.7	12.6	8.5	-0.1	-1.1	Pass	Pass	1.54
32	Freight - SEART	EASTBOUND	6.30	7.8	12.8	18.5	12.9	0.0	0.2	Pass	Pass	6.17
33	Mt Wellington Highway / Great South	NORTHBOUND	24.95	36.1	52.7	73.9	51.1	0.0	-1.6	Pass	Pass	15.71
33	Mt Wellington Highway / Great South	SOUTHBOUND	24.95	40.6	67.1	110.2	47.8	-0.3	-19.3	Low	Pass	19.87
34	Inner Eastern	NORTHBOUND	18.59	28.9	42.7	63.2	35.6	-0.2	-7.1	Low	Pass	8.11
34	Inner Eastern	SOUTHBOUND	18.59	29.0	43.7	116.2	36.9	-0.2	-6.8	Low	Pass	9.40
35	Lincoln Road	NORTHBOUND	3.05	5.7	9.5	15.5	7.2	-0.2	-2.3	Low	Pass	2.61
35	Lincoln Road	SOUTHBOUND	3.05	4.7	8.5	12.4	6.7	-0.2	-1.8	Low	Pass	1.79
36	Onewa Road	WESTBOUND	2.24	3.2	5.2	7.0	6.5	0.3	1.4	High	Pass	1.37
36	Onewa Road	EASTBOUND	2.24	3.0	3.8	4.4	4.0	0.1	0.2	Pass	Pass	0.35
37	Mangere / Massey	EASTBOUND	6.44	9.5	14.1	19.7	10.7	-0.2	-3.4	Low	Pass	3.35
37	Mangere / Massey	WESTBOUND	6.44	11.4	17.6	36.2	12.1	-0.3	-5.5	Low	Pass	5.46
39	Constellation Drive	EASTBOUND	1.37	2.4	3.3	4.2	3.1	-0.1	-0.2	Pass	Pass	0.20
39	Constellation Drive	WESTBOUND	1.37	4.1	6.4	9.3	3.7	-0.4	-2.7	Low	Low	2.73
40	East Coast / Forrest Hill	NORTHBOUND	10.79	14.4	21.4	33.1	18.1	-0.2	-3.3	Low	Pass	3.53
40	East Coast / Forrest Hill	SOUTHBOUND	10.79	12.8	17.7	23.3	16.2	-0.1	-1.5	Pass	Pass	1.88
42	Esmonde Road / Lake Road	NORTHBOUND	5.69	9.6	17.3	24.8	10.1	-0.4	-7.2	Low	Pass	7.20
42	Esmonde Road / Lake Road	SOUTHBOUND	5.69	8.7	11.4	14.8	13.8	0.2	2.4	High	Pass	4.18
46	Great South Road	NORTHBOUND	9.74	17.5	31.8	50.0	26.3	-0.2	-5.5	Low	Pass	12.76
46	Great South Road	SOUTHBOUND	9.74	15.8	27.4	43.2	19.7	-0.3	-7.7	Low	Pass	8.04
47	Te Atatu / Edmonton Roads	NORTHBOUND	6.49	9.2	12.6	16.6	12.0	0.0	-0.6	Pass	Pass	3.33
47	Te Atatu / Edmonton Roads	SOUTHBOUND	6.49	11.2	15.7	25.3	15.5	0.0	-0.1	Pass	Pass	8.71
48	Oteha Valley Road	EASTBOUND	3.41	5.3	6.6	7.6	5.1	-0.2	-1.5	Low	Low	1.47
48	Oteha Valley Road	WESTBOUND	3.41	3.5	4.5	6.4	5.2	0.1	0.6	Pass	Pass	0.64
49	Te Irirangi Road	NORTHBOUND	10.50	13.2	25.3	37.4	18.1	-0.3	-7.2	Low	Pass	7.50
49	Te Irirangi Road	SOUTHBOUND	10.50	12.1	20.0	30.7	16.8	-0.2	-3.2	Low	Pass	3.57
51	Great North Road	EASTBOUND	15.69	22.4	29.6	40.7	29.6	0.0	0.0	Pass	Pass	5.05
51	Great North Road	WESTBOUND	15.69	25.4	42.1	60.8	33.3	-0.2	-8.7	Low	Pass	10.86
54	Dominion Road	NORTHBOUND	6.08	9.6	14.6	20.8	13.2	-0.1	-1.3	Pass	Pass	2.75
54	Dominion Road	SOUTHBOUND	6.08	12.6	18.2	29.1	13.8	-0.2	-4.5	Low	Pass	6.23
55	Ellerslie Panmure / Ti Raukau Drive	WESTBOUND	14.02	17.8	26.8	37.5	22.6	-0.2	-4.2	Low	Pass	5.51
55	Ellerslie Panmure / Ti Raukau Drive	EASTBOUND	14.02	20.6	29.2	40.6	26.2	-0.1	-3.0	Pass	Pass	5.31
56	Tamaki Drive	EASTBOUND	5.85	7.6	9.4	21.8	7.6	-0.2	-1.8	Low	Pass	1.86
56	Tamaki Drive	WESTBOUND	5.85	7.3	8.4	9.8	7.2	-0.1	-1.2	Pass	Low	1.15
58	East Tamaki / Springs Roads	NORTHBOUND	4.82	7.5	9.2	11.1	9.3	0.0	0.2	Pass	Pass	0.32
58	East Tamaki / Springs Roads	SOUTHBOUND	4.82	7.8	11.3	15.7	10.0	-0.1	-1.3	Pass	Pass	1.97
59	Blockhouse Bay Road	NORTHBOUND	4.11	8.2	10.6	14.9	7.6	-0.3	-3.0	Low	Low	3.00
59	Blockhouse Bay Road	SOUTHBOUND	4.11	6.5	10.9	15.5	8.1	-0.3	-2.8	Low	Pass	2.83
60	Hillsborough / Godley Roads	EASTBOUND	11.45	14.6	22.3	3741.8	16.8	-0.2	-5.5	Low	Pass	6.86
60	Hillsborough / Godley Roads	WESTBOUND	11.45	17.5	23.1	29.7	18.5	-0.2	-4.5	Low	Pass	5.50
61	Roscommon / Weymouth Roads	NORTHBOUND	7.13	8.9	11.8	15.2	10.8	-0.1	-1.0	Pass	Pass	1.10

Route ID	Route Name	direction	Length	PM-Obs 15th Percentile	PM-Obs Observed Mean	PM-Obs 85th Percentile	PM-modelled	% Diff	Abs Diff	Within 15% or 1 min	Within 15th/85th	+ Abs Diff
61	Roscommon / Weymouth Roads	SOUTHBOUND	7.13	9.6	13.7	27.6	12.4	-0.1	-1.3	Pass	Pass	2.16
62	Whangaparaoa Road	EASTBOUND	16.22	20.7	25.0	29.4	24.2	0.0	-0.8	Pass	Pass	4.70
62	Whangaparaoa Road	WESTBOUND	16.22	17.7	20.4	23.7	22.4	0.1	2.0	Pass	Pass	2.86
66	Greville Road	EASTBOUND	1.12	1.2	2.5	4.3	1.9	-0.2	-0.6	Pass	Pass	0.58
66	Greville Road	WESTBOUND	1.12	1.1	1.6	2.3	1.7	0.0	0.1	Pass	Pass	0.17
68	Mt Albert / Mt Smart / Mays	WESTBOUND	10.97	24.1	43.4	67.1	23.6	-0.5	-19.8	Low	Low	19.77
68	Mt Albert / Mt Smart / Mays	EASTBOUND	10.97	17.0	27.5	37.9	20.3	-0.3	-7.2	Low	Pass	8.03
67	Wiri Station / Mill Roads	WESTBOUND	14.50	15.3	18.2	22.3	16.3	-0.1	-1.8	Pass	Pass	5.57
67	Wiri Station / Mill Roads	EASTBOUND	14.50	19.7	26.9	39.3	23.7	-0.1	-3.2	Pass	Pass	6.66
83	Hibiscus Coast Highway	NORTHBOUND	6.48	9.2	12.0	14.9	11.3	-0.1	-0.6	Pass	Pass	1.65
83	Hibiscus Coast Highway	SOUTHBOUND	6.48	7.4	11.3	16.7	9.6	-0.2	-1.8	Low	Pass	2.07
85	Kitchener / Hurstmere	NORTHBOUND	5.46	7.9	10.1	13.5	8.9	-0.1	-1.2	Pass	Pass	1.59
85	Kitchener / Hurstmere	SOUTHBOUND	5.46	7.3	9.3	11.6	8.5	-0.1	-0.8	Pass	Pass	1.20
86	Kaipatiki / Birkdale / Mokoia	NORTHBOUND	5.60	6.7	8.2	9.8	7.6	-0.1	-0.6	Pass	Pass	0.72
86	Kaipatiki / Birkdale / Mokoia	SOUTHBOUND	5.60	6.9	8.6	11.9	8.4	0.0	-0.2	Pass	Pass	1.43
95	Newton / Kyber Pass	WESTBOUND	2.54	5.0	12.4	20.1	7.9	-0.4	-4.5	Low	Pass	4.49
95	Newton / Kyber Pass	EASTBOUND	2.54	5.8	12.8	20.8	10.5	-0.2	-2.3	Low	Pass	2.29
108	Puhinui Rd	EASTBOUND	11.45	16.8	22.8	29.6	25.3	0.1	2.5	Pass	Pass	11.42
108	Puhinui Rd	WESTBOUND	11.45	14.6	19.4	27.0	16.0	-0.2	-3.5	Low	Pass	3.97
116	Northcote / Ocean View / Pupuke	EASTBOUND	3.51	4.7	8.7	13.9	6.8	-0.2	-1.9	Low	Pass	4.31
116	Northcote / Ocean View / Pupuke	WESTBOUND	3.51	5.0	10.4	16.5	6.9	-0.3	-3.5	Low	Pass	4.01
120	Parnell / Broadway	NORTHBOUND	3.15	6.0	14.2	23.1	16.6	0.2	2.4	High	Pass	5.80
120	Parnell / Broadway	SOUTHBOUND	3.15	7.9	14.5	22.7	11.5	-0.2	-3.0	Low	Pass	5.87
126	Northern Motorway Northbound	NORTHBOUND	28.11	20.7	26.3	32.9	26.5	0.0	0.2	Pass	Pass	8.07
127	Upper Harbour Motorway Westbound	WESTBOUND	13.20	8.8	10.5	12.6	11.4	0.1	1.0	Pass	Pass	2.19
128	Upper Harbour Motorway Eastbound	EASTBOUND	13.25	8.6	11.6	15.7	12.7	0.1	1.1	Pass	Pass	2.88
129	Southern Motorway Southbound	SOUTHBOUND	35.42	30.5	49.0	71.0	38.4	-0.2	-10.6	Low	Pass	22.41
130	Southern Motorway Northbound	NORTHBOUND	35.24	28.2	40.2	58.6	32.3	-0.2	-7.9	Low	Pass	18.14
131	Northern Motorway Southbound	SOUTHBOUND	28.65	20.3	28.6	39.9	22.1	-0.2	-6.6	Low	Pass	10.39
52	Manukau Road	NORTHBOUND	9.21	13.2	24.9	39.0	28.3	0.1	3.4	Pass	Pass	9.26
92	New North Rd	EASTBOUND	7.05	9.3	15.1	22.6	14.3	0.0	-0.7	Pass	Pass	2.13
92	New North Rd	WESTBOUND	7.05	11.3	19.4	29.7	15.4	-0.2	-4.0	Low	Pass	4.91
142	SH20A Southbound	SOUTHBOUND	5.41	5.4	7.9	10.8	7.1	-0.1	-0.7	Pass	Pass	1.48
143	SH20A Northbound	NORTHBOUND	5.43	5.5	8.0	10.7	10.9	0.4	3.0	High	High	4.90
144	Albany Expressway	WESTBOUND	1.95	2.2	6.2	9.7	3.2	-0.5	-3.0	Low	Pass	2.98
144	Albany Expressway	EASTBOUND	1.95	2.1	3.5	6.3	3.9	0.1	0.4	Pass	Pass	0.86
153	Te Atatu Rd South	NORTHBOUND	2.44	3.3	6.5	10.4	3.4	-0.5	-3.1	Low	Pass	3.06
153	Te Atatu Rd South	SOUTHBOUND	2.44	3.0	4.0	5.2	4.2	0.0	0.2	Pass	Pass	0.35
171	Northwestern Motorway Westbound	WESTBOUND	23.83	22.6	36.5	51.6	25.4	-0.3	-11.0	Low	Pass	13.73
172	Northwestern Motorway Eastbound	EASTBOUND	23.83	17.5	20.7	23.7	23.1	0.1	2.4	Pass	Pass	4.12
138	SH20 Southbound	SOUTHBOUND	20.34	19.9	28.2	38.9	26.8	0.0	-1.4	Pass	Pass	5.94
139	SH20 Northbound	NORTHBOUND	20.24	16.2	21.4	28.7	18.5	-0.1	-2.9	Pass	Pass	5.12
184	New North Rd/Symonds St	WESTBOUND	0.77	1.5	2.8	4.9	2.1	-0.3	-0.7	Pass	Pass	0.74
184	New North Rd/Symonds St	EASTBOUND	0.77	1.1	2.1	2.9	2.7	0.3	0.7	Pass	Pass	0.68
53	Manukau Road	SOUTHBOUND	9.22	18.3	30.1	46.5	19.8	-0.3	-10.4	Low	Pass	10.36

PM 5pm – 6pm

Route ID	Route Name	direction	Length	PM-Obs 15th Percentile	PM-Obs Observed Mean	PM-Obs 85th Percentile	PM-modelled	% Diff	Abs Diff	Within 15% or 1 min	Within 15th/85th	+ Abs Diff
12	Albany Hwy	NORTHBOUND	11.13	18.7	28.4	41.1	21.2	-0.3	-7.2	Low	Pass	7.93
12	Albany Hwy	SOUTHBOUND	11.13	19.3	25.6	32.9	21.2	-0.2	-4.4	Low	Pass	8.46
17	Freight - Neilson	EASTBOUND	5.45	8.8	16.1	29.8	9.8	-0.4	-6.2	Low	Pass	6.23
17	Freight - Neilson	WESTBOUND	5.45	9.7	22.0	35.2	9.5	-0.6	-12.5	Low	Low	12.49
18	Freight - Highbrook	EASTBOUND	6.12	7.0	13.3	25.0	9.6	-0.3	-3.7	Low	Pass	4.98
18	Freight - Highbrook	WESTBOUND	6.12	6.3	10.8	17.4	8.3	-0.2	-2.4	Low	Pass	2.88
23	Balmoral Road	WESTBOUND	13.52	24.2	41.8	78.0	30.0	-0.3	-11.9	Low	Pass	12.05
23	Balmoral Road	EASTBOUND	13.52	20.7	35.8	54.8	32.0	-0.1	-3.8	Pass	Pass	6.95
32	Freight - SEART	WESTBOUND	6.30	7.7	13.6	18.8	7.2	-0.5	-6.3	Low	Low	6.32
32	Freight - SEART	EASTBOUND	6.30	10.4	17.7	25.4	12.1	-0.3	-5.6	Low	Pass	6.17
33	Mt Wellington Highway / Great South	NORTHBOUND	24.95	38.0	57.5	102.2	46.4	-0.2	-11.1	Low	Pass	17.19
33	Mt Wellington Highway / Great South	SOUTHBOUND	24.95	43.5	71.6	112.6	49.6	-0.3	-22.0	Low	Pass	23.99
34	Inner Eastern	NORTHBOUND	18.59	36.4	58.9	89.1	35.9	-0.4	-23.0	Low	Low	23.39
34	Inner Eastern	SOUTHBOUND	18.59	29.9	48.6	71.5	36.6	-0.2	-12.0	Low	Pass	12.64
35	Lincoln Road	NORTHBOUND	3.05	5.6	10.3	16.1	6.6	-0.4	-3.7	Low	Pass	4.12
35	Lincoln Road	SOUTHBOUND	3.05	4.3	8.1	11.7	6.5	-0.2	-1.6	Low	Pass	2.39
36	Onewa Road	WESTBOUND	2.24	3.7	6.1	8.5	5.0	-0.2	-1.1	Low	Pass	1.09
36	Onewa Road	EASTBOUND	2.24	2.9	4.3	6.6	4.8	0.1	0.5	Pass	Pass	0.51
37	Mangere / Massey	EASTBOUND	6.44	10.5	15.5	24.7	10.2	-0.3	-5.3	Low	Low	5.28
37	Mangere / Massey	WESTBOUND	6.44	10.7	17.7	28.7	11.6	-0.3	-6.1	Low	Pass	6.11
39	Constellation Drive	EASTBOUND	1.37	2.6	4.2	5.1	3.3	-0.2	-0.8	Pass	Pass	0.80
39	Constellation Drive	WESTBOUND	1.37	5.0	7.6	12.4	3.9	-0.5	-3.7	Low	Low	3.72
40	East Coast / Forrest Hill	NORTHBOUND	10.79	17.1	25.1	34.7	18.7	-0.3	-6.4	Low	Pass	6.57
40	East Coast / Forrest Hill	SOUTHBOUND	10.79	14.4	18.8	27.0	16.6	-0.1	-2.2	Pass	Pass	2.48
42	Esmonde Road / Lake Road	NORTHBOUND	5.69	7.9	11.1	14.0	9.3	-0.2	-1.8	Low	Pass	2.10
42	Esmonde Road / Lake Road	SOUTHBOUND	5.69	14.3	19.0	23.5	15.5	-0.2	-3.5	Low	Pass	5.40
46	Great South Road	NORTHBOUND	9.74	18.0	41.0	71.4	31.2	-0.2	-9.8	Low	Pass	28.43
46	Great South Road	SOUTHBOUND	9.74	15.4	30.2	56.3	19.1	-0.4	-11.1	Low	Pass	11.68
47	Te Atatu / Edmonton Roads	NORTHBOUND	6.49	9.2	12.9	20.3	10.9	-0.2	-2.0	Low	Pass	3.74
47	Te Atatu / Edmonton Roads	SOUTHBOUND	6.49	10.9	15.0	20.0	15.3	0.0	0.4	Pass	Pass	7.05
48	Oteha Valley Road	EASTBOUND	3.41	7.7	9.2	10.9	5.2	-0.4	-4.0	Low	Low	4.04
48	Oteha Valley Road	WESTBOUND	3.41	4.0	5.5	6.8	5.3	0.0	-0.1	Pass	Pass	0.68
49	Te Irirangi Road	NORTHBOUND	10.50	16.1	32.4	50.4	18.5	-0.4	-13.9	Low	Pass	13.98
49	Te Irirangi Road	SOUTHBOUND	10.50	14.7	23.6	40.3	16.6	-0.3	-7.0	Low	Pass	7.53
51	Great North Road	EASTBOUND	15.69	24.2	32.5	41.8	30.3	-0.1	-2.3	Pass	Pass	6.87
51	Great North Road	WESTBOUND	15.69	31.6	50.1	72.3	34.6	-0.3	-15.5	Low	Pass	17.24
54	Dominion Road	NORTHBOUND	6.08	9.3	16.0	24.7	13.5	-0.2	-2.5	Low	Pass	3.03
54	Dominion Road	SOUTHBOUND	6.08	15.1	21.8	29.6	15.5	-0.3	-6.3	Low	Pass	6.31
55	Ellerslie Panmure / Ti Raukau Drive	WESTBOUND	14.02	18.5	26.9	37.8	22.3	-0.2	-4.5	Low	Pass	5.95
55	Ellerslie Panmure / Ti Raukau Drive	EASTBOUND	14.02	24.9	40.3	57.1	29.2	-0.3	-11.1	Low	Pass	12.87
56	Tamaki Drive	EASTBOUND	5.85	8.9	10.3	18.8	7.8	-0.2	-2.5	Low	Low	2.55
56	Tamaki Drive	WESTBOUND	5.85	7.9	8.4	9.0	7.3	-0.1	-1.1	Pass	Low	1.12
58	East Tamaki / Springs Roads	NORTHBOUND	4.82	9.2	10.4	11.5	8.7	-0.2	-1.7	Low	Low	1.75
58	East Tamaki / Springs Roads	SOUTHBOUND	4.82	6.9	10.4	15.8	9.5	-0.1	-0.8	Pass	Pass	0.80
59	Blockhouse Bay Road	NORTHBOUND	4.11	6.5	9.1	12.1	8.1	-0.1	-1.0	Pass	Pass	0.98
59	Blockhouse Bay Road	SOUTHBOUND	4.11	11.0	17.9	26.3	8.1	-0.5	-9.8	Low	Low	9.78
60	Hillsborough / Godley Roads	EASTBOUND	11.45	14.1	16.8	26.7	16.4	0.0	-0.4	Pass	Pass	1.12
60	Hillsborough / Godley Roads	WESTBOUND	11.45	17.2	26.0	35.2	19.6	-0.2	-6.4	Low	Pass	7.22
61	Roscommon / Weymouth Roads	NORTHBOUND	7.13	9.3	11.1	13.3	10.8	0.0	-0.3	Pass	Pass	0.51

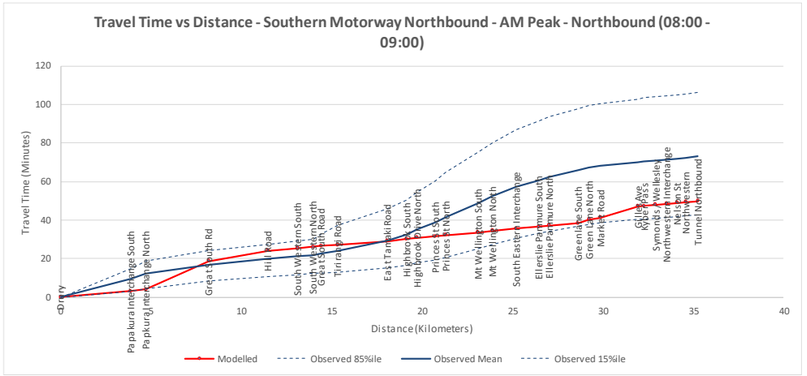
Route ID	Route Name	direction	Length	PM-Obs 15th Percentile	PM-Obs Observed Mean	PM-Obs 85th Percentile	PM-modelled	% Diff	Abs Diff	Within 15% or 1 min	Within 15th/85th	+ Abs Diff
61	Roscommon / Weymouth Roads	SOUTHBOUND	7.13	14.5	19.6	26.9	13.5	-0.3	-6.0	Low	Low	6.03
62	Whangaparaoa Road	EASTBOUND	16.22	21.2	25.7	31.5	23.9	-0.1	-1.8	Pass	Pass	3.08
62	Whangaparaoa Road	WESTBOUND	16.22	17.5	21.4	28.7	20.0	-0.1	-1.4	Pass	Pass	3.21
66	Greville Road	EASTBOUND	1.12	1.2	1.7	2.9	1.8	0.1	0.1	Pass	Pass	0.13
66	Greville Road	WESTBOUND	1.12	1.2	1.6	3.1	1.7	0.0	0.1	Pass	Pass	0.38
68	Mt Albert / Mt Smart / Mays	WESTBOUND	10.97	21.5	60.3	134.8	23.2	-0.6	-37.0	Low	Pass	37.04
68	Mt Albert / Mt Smart / Mays	EASTBOUND	10.97	18.2	28.3	40.3	20.9	-0.3	-7.4	Low	Pass	8.03
67	Wiri Station / Mill Roads	WESTBOUND	14.50	17.6	19.2	20.9	16.0	-0.2	-3.2	Low	Low	3.18
67	Wiri Station / Mill Roads	EASTBOUND	14.50	25.8	37.0	55.2	29.5	-0.2	-7.4	Low	Pass	19.28
83	Hibiscus Coast Highway	NORTHBOUND	6.48	9.2	12.8	18.1	10.0	-0.2	-2.8	Low	Pass	4.23
83	Hibiscus Coast Highway	SOUTHBOUND	6.48	8.2	10.9	14.4	9.3	-0.1	-1.6	Pass	Pass	1.82
85	Kitchener / Hurstmere	NORTHBOUND	5.46	9.0	12.6	16.8	8.8	-0.3	-3.8	Low	Low	3.80
85	Kitchener / Hurstmere	SOUTHBOUND	5.46	8.1	9.9	11.5	8.6	-0.1	-1.3	Pass	Pass	1.58
86	Kaipatiki / Birkdale / Mokoia	NORTHBOUND	5.60	7.0	9.1	12.1	7.5	-0.2	-1.6	Low	Pass	1.77
86	Kaipatiki / Birkdale / Mokoia	SOUTHBOUND	5.60	7.4	8.6	10.0	8.3	0.0	-0.3	Pass	Pass	1.87
95	Newton / Kyber Pass	WESTBOUND	2.54	8.5	18.2	37.6	7.6	-0.6	-10.6	Low	Low	10.58
95	Newton / Kyber Pass	EASTBOUND	2.54	6.6	13.4	23.3	9.7	-0.3	-3.7	Low	Pass	3.75
108	Puhinui Rd	EASTBOUND	11.45	16.3	26.5	41.0	30.2	0.1	3.7	Pass	Pass	16.60
108	Puhinui Rd	WESTBOUND	11.45	16.0	20.4	36.8	18.9	-0.1	-1.5	Pass	Pass	6.81
116	Northcote / Ocean View / Pupuke	EASTBOUND	3.51	5.0	7.9	12.8	5.6	-0.3	-2.3	Low	Pass	3.63
116	Northcote / Ocean View / Pupuke	WESTBOUND	3.51	5.6	10.7	16.4	8.3	-0.2	-2.4	Low	Pass	3.67
120	Parnell / Broadway	NORTHBOUND	3.15	6.6	13.2	21.4	20.6	0.6	7.3	High	Pass	7.95
120	Parnell / Broadway	SOUTHBOUND	3.15	10.5	23.9	39.2	13.2	-0.4	-10.7	Low	Pass	11.61
126	Northern Motorway Northbound	NORTHBOUND	28.11	19.7	25.7	32.3	27.9	0.1	2.2	Pass	Pass	8.15
127	Upper Harbour Motorway Westbound	WESTBOUND	13.20	8.9	10.8	13.0	11.1	0.0	0.2	Pass	Pass	2.92
128	Upper Harbour Motorway Eastbound	EASTBOUND	13.25	8.6	11.6	15.1	11.4	0.0	-0.1	Pass	Pass	2.76
129	Southern Motorway Southbound	SOUTHBOUND	35.42	30.7	52.3	83.0	44.0	-0.2	-8.3	Low	Pass	27.46
130	Southern Motorway Northbound	NORTHBOUND	35.24	27.4	43.0	67.4	37.0	-0.1	-6.0	Pass	Pass	18.04
131	Northern Motorway Southbound	SOUTHBOUND	28.65	20.3	29.5	39.8	23.8	-0.2	-5.7	Low	Pass	11.09
52	Manukau Road	NORTHBOUND	9.21	13.4	23.9	36.2	40.7	0.7	16.8	High	High	23.76
92	New North Rd	EASTBOUND	7.05	12.8	20.5	35.0	14.7	-0.3	-5.8	Low	Pass	7.85
92	New North Rd	WESTBOUND	7.05	13.5	25.3	39.5	16.0	-0.4	-9.3	Low	Pass	9.27
142	SH20A Southbound	SOUTHBOUND	5.41	5.2	7.4	10.2	8.1	0.1	0.7	Pass	Pass	2.12
143	SH20A Northbound	NORTHBOUND	5.43	5.7	9.7	16.1	12.7	0.3	3.0	High	Pass	8.71
144	Albany Expressway	WESTBOUND	1.95	6.2	10.9	15.6	3.1	-0.7	-7.7	Low	Low	7.72
144	Albany Expressway	EASTBOUND	1.95	2.3	6.5	13.2	4.6	-0.3	-1.9	Low	Pass	1.89
153	Te Atatu Rd South	NORTHBOUND	2.44	3.1	5.7	8.3	3.4	-0.4	-2.3	Low	Pass	2.28
153	Te Atatu Rd South	SOUTHBOUND	2.44	3.1	4.0	5.4	3.9	0.0	-0.1	Pass	Pass	0.23
171	Northwestern Motorway Westbound	WESTBOUND	23.83	23.1	40.4	58.7	30.4	-0.2	-10.0	Low	Pass	18.48
172	Northwestern Motorway Eastbound	EASTBOUND	23.83	17.9	22.3	27.0	23.2	0.0	0.9	Pass	Pass	5.08
138	SH20 Southbound	SOUTHBOUND	20.34	21.4	29.3	41.3	25.5	-0.1	-3.9	Pass	Pass	6.93
139	SH20 Northbound	NORTHBOUND	20.24	18.0	28.8	46.1	23.4	-0.2	-5.4	Low	Pass	11.24
184	New North Rd/Symonds St	WESTBOUND	0.77	3.4	3.4	3.4	2.0	-0.4	-1.4	Low	Low	1.43
184	New North Rd/Symonds St	EASTBOUND	0.77	1.2	2.7	5.3	2.4	-0.1	-0.3	Pass	Pass	0.33
53	Manukau Road	SOUTHBOUND	9.22	17.1	32.4	56.1	29.6	-0.1	-2.9	Pass	Pass	19.96

Appendix J

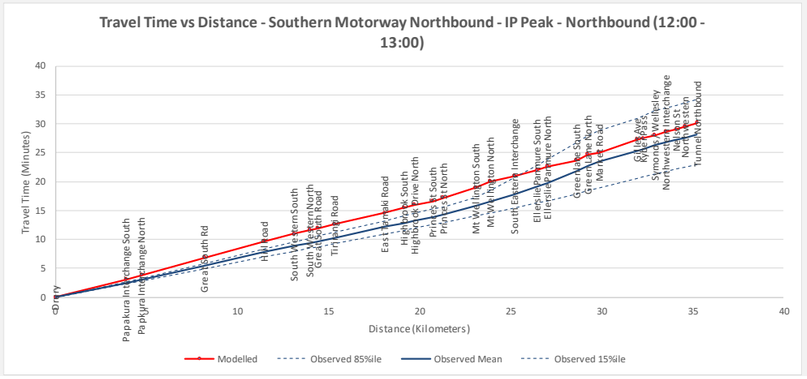
Distance-Travel Time Graphs

130 – Southern SH1 – Northbound

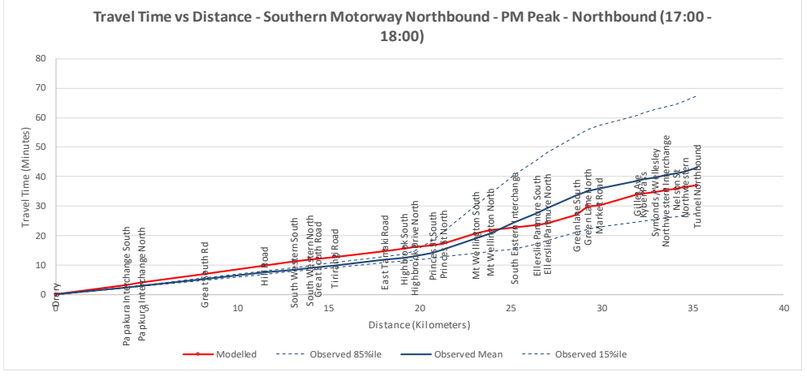
AM Peak



Inter Peak

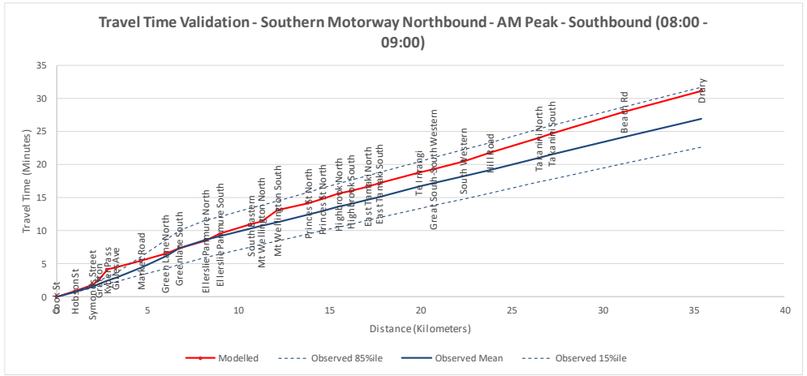


PM Peak

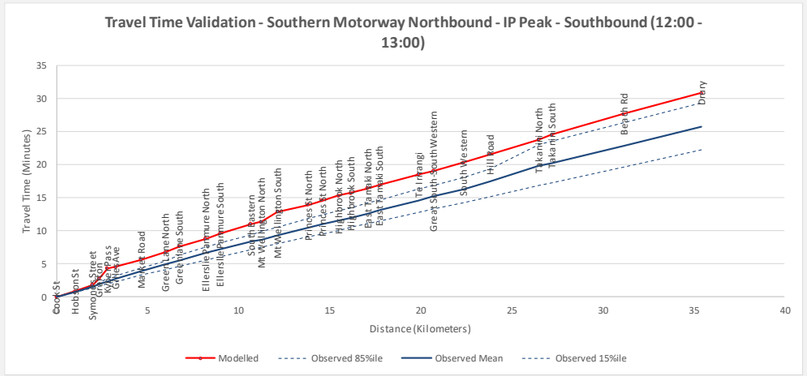


129 – Southern SH1 – Soutbhound

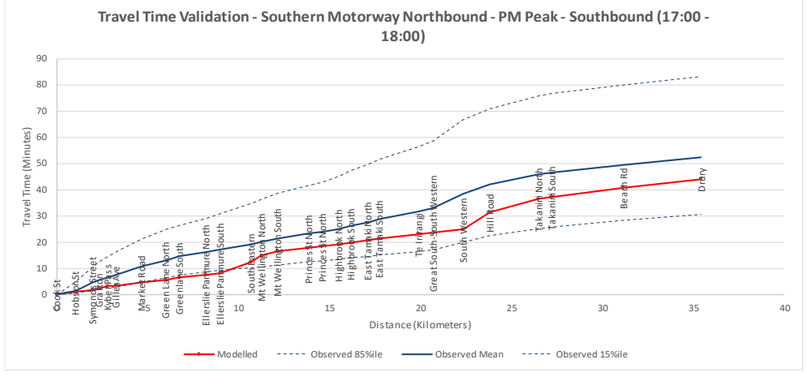
AM Peak



Inter Peak

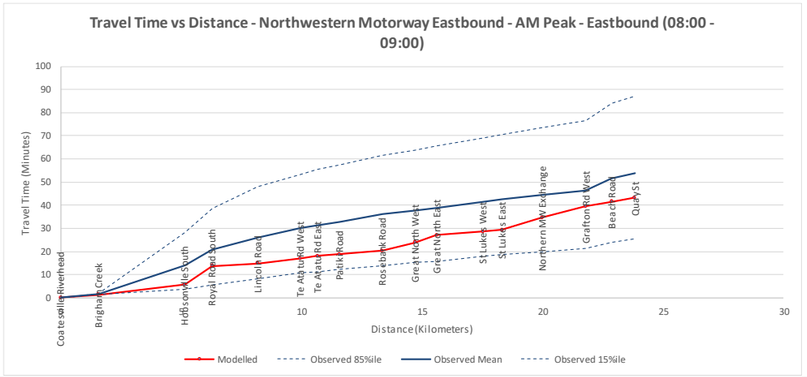


PM Peak

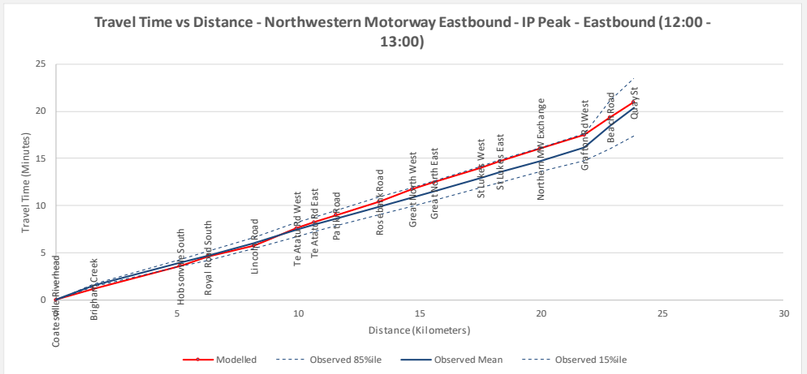


172 – SH16 – Eastbound

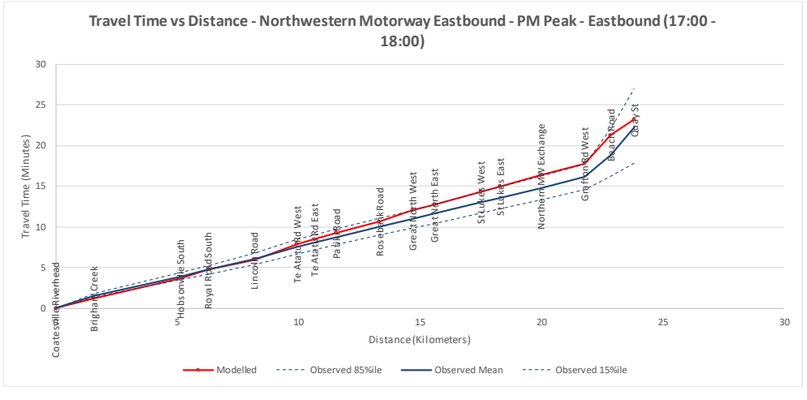
AM Peak



Inter Peak

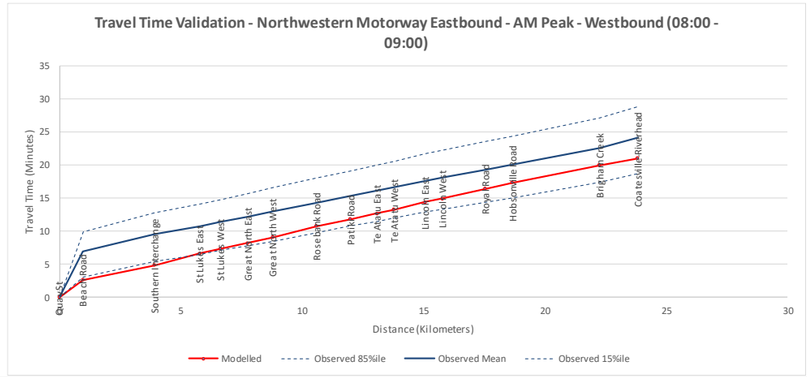


PM Peak

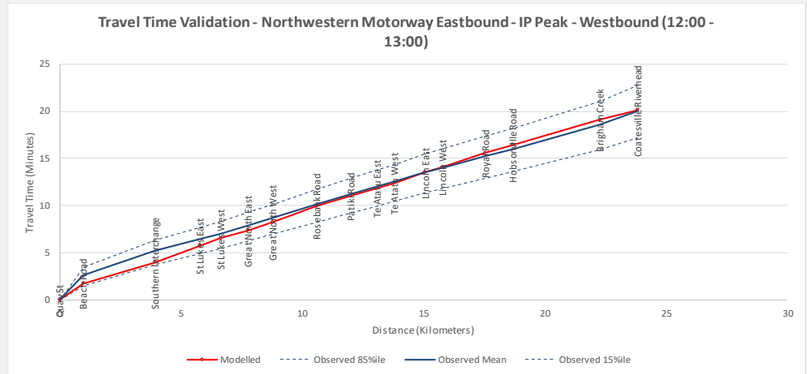


171 – SH16 – Westbound

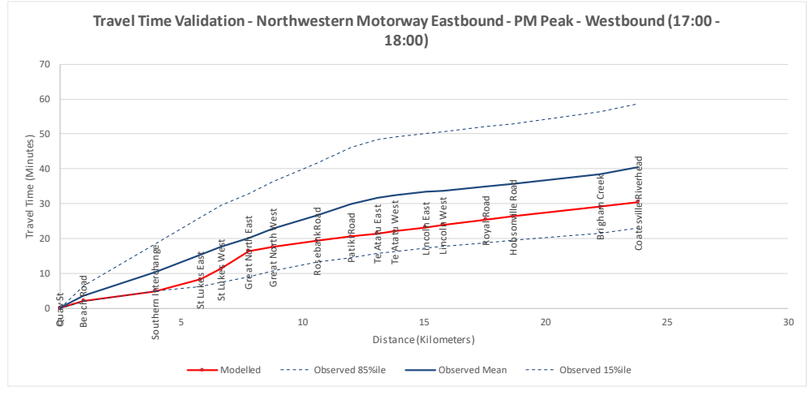
AM Peak



Inter Peak

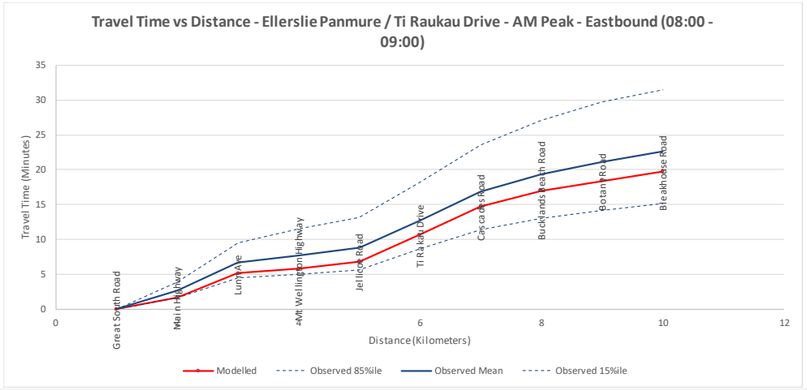


PM Peak

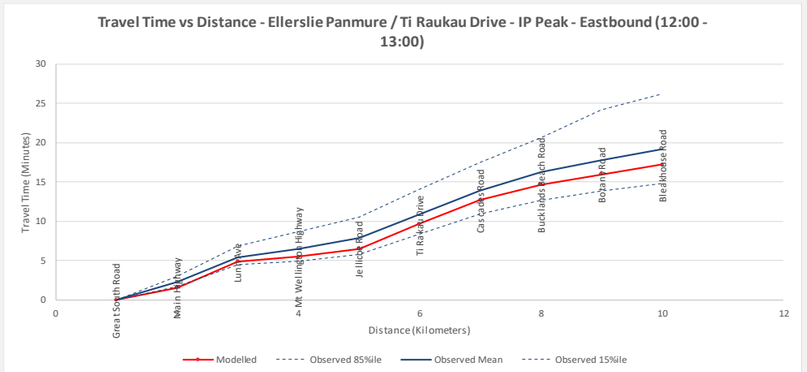


55 – Ellerslie Panmure / Ti Rakau – Eastbound

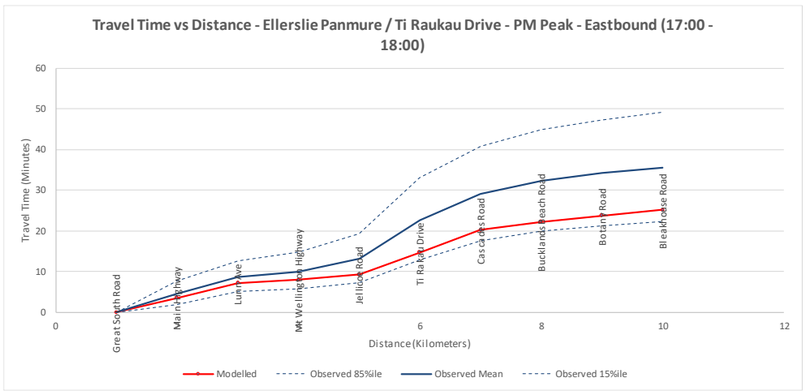
AM Peak



Inter Peak

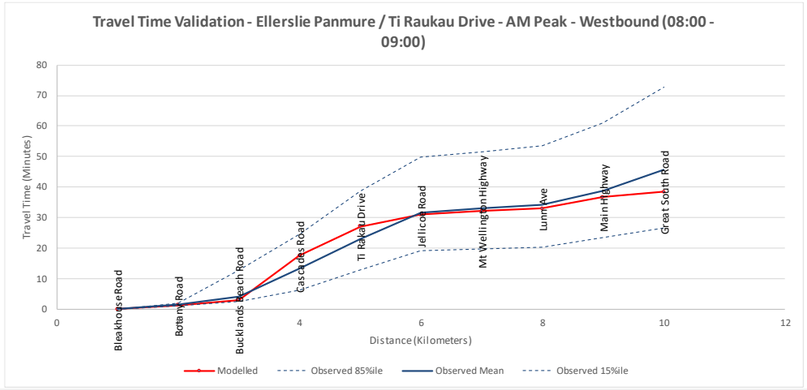


PM Peak

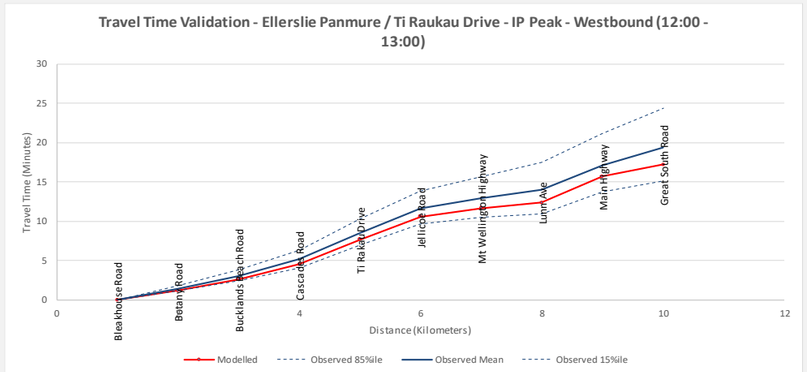


55 – Ellerslie Panmure / Ti Rakau – Westhound

AM Peak



Inter Peak



PM Peak