

## PROPOSED TE PŪTAHI LADIES MILE PLAN VARIATION

### RESPONSE FROM COLIN ROBERT SHIELDS TO PANEL TRANSPORT QUESTIONS RAISED ON 5 AND 6 DECEMBER 2023

1. As directed by the Panel, I set out below my response to the transport related questions raised by the Panel on 5 and 6 December 2023. I include the questions in italics and my response follows this using the following headings:
  - (a) My Summary Statement;
  - (b) Parking;
  - (c) Modelling;
  - (d) Monitoring; and
  - (e) TPLM Variation provisions.

#### Summary Statement

*Paragraph 41 - Interdependency of TPLM Variation and W2G partners investment - if Panel minded approving TPLM Variation, what happens if W2G investment doesn't happen? How big a risk is this?*

2. This is addressed in paragraphs 15 and 16 of Mr Brown's Summary of Evidence and subsequent discussion at the presentation to the Panel on 6 December 2023.

*Paragraph 46 – Following on from your information on daily variation of existing traffic volumes, can you please provide:*

- a) *Standard deviation.*
  - b) *% differences.*
  - c) *Variations by month.*
3. My response is as follows:
  - (a) The Standard deviation for daily traffic over the two week period of 9 October to 22 October 2023 is 2,067.
  - (b) Figures 1 to 2 in **Appendix A** show the % variations of the average daily traffic flow of 17,895 for weekdays (Figure 1) and for weekends (Figure 2).
  - (c) For the same permanent count site as a) and b) above, variations by month for the 12 month period November 2022 to October 2023 are shown in Figure 3 of **Appendix A**. Note October 2023 is the most recent full month of data. A review of the data indicated that there was one day of data (24<sup>th</sup>) missing from

September 2023 and two days of data (23<sup>rd</sup> and 24<sup>th</sup>) missing from October 2023.

*Paragraph 47–In relation to international research on housing density and reduction in vehicle trips, please provide:*

- a) *List of research used.*
  - b) *Compare research findings with that of Mr Parlane.*
  - c) *Short statement on relevance of research to Queenstown context.*
4. To respond to (a) research used included, please refer to weblinks provided (press CTRL + click):
- (a) [\(PDF\) Smart Growth -- As Seen From the Air Convenient Neighborhood, Skip the Car \(researchgate.net\)](#)
  - (b) [Gasoline Consumption and Cities Revisited: What Have We Learnt? \(scirp.org\)](#)
  - (c) [The impact of residential density on vehicle usage and energy consumption - ScienceDirect](#)
  - (d) [Transport solution in denser housing - NZ Herald](#)
5. To respond to (b) as detailed in my EIR, Mr Parlane used research which indicated:
- (a) Density is only one driver of mode share (reference Mees, Paul, How dense are we? Another look at urban density and transport patterns in Australia, Canada and the USA, RMIT, Melbourne 2009).
  - (b) There are diminishing returns to density. Increases in density have their greatest effect in less dense areas, and density increases in high density areas have less effect (reference Haider, Murtaza. 2019. "Diminishing Returns to Density and Public Transit." Transport Findings, October. <https://doi.org/10.32866/10679>.)
  - (c) For 40 dwellings per hectare and 60 dwellings per hectare the higher density would result in a higher mode share (reference Cooke, S. & Behrens, R., 2016. Correlation or cause? The limitations of population density as an indicator for public transport viability in the context of a rapidly growing developing city. Transportation Research Procedia 25 (2017) 3003–3016)

- (d) The Other End of the Trip Matters i.e. there are a number of people who work at home or work within their own local area (reference Statistics NZ Census Journey to Work data 2018 based on resident address for Lake Hayes Estate (note not based on work address).
6. Mr Parlane concluded from his research that *“In my view a better minimum would be 40 dwellings per hectare gross because that is a level that still provides for most of the transport advantages that come with density”*.
7. I agree with Mr Parlane’s conclusion from his research that 40 dwellings per hectare (Ha) is the minimum density level and I consider that both the research I have used and the research that Mr Parlane has used, demonstrates that there is greater potential for mode shift with densities of 40 to 60 dwellings/Ha (the difference between our research relates to the scale of mode shift in the 40 to 60 dwellings/Ha range).
8. To respond to (c), as explained in my presentation to the Panel, the research used by both Mr Parlane and myself is primarily North American and European. I consider this to be appropriate research to inform the New Zealand context given it is based on examples from what can be considered car-centric locations.

*Paragraph 49– Please provide details of the Aspen Transport environment*

9. The Transport environment is described in section 2.2 (page 19) of the TPLM Transport Strategy and I repeat this as follows: *“Aspen has many features in common with Queenstown: It has very expensive real estate and significant housing affordability challenges, resulting in many workers needing to commute long distances to jobs in Aspen. As a year-round resort destination, it has the same “insatiable desirability” that literally drives its transport issues. Growth in air services has in both cases been a key driver of visitor and population growth and it has even similarly constrained access as Queenstown with one route in and out of the town centre”*.
10. In reference to the Panel question regarding whether the Queenstown winter climate would deter people using the bus or walk and cycle, it should be noted that Aspen is also a ski resort, and has colder winter weather conditions than Queenstown ([queenstown climate - Google Search](#) [aspen climate - Google Search](#), [aspen climate - Google Search](#)).

11. In reference to the Panel question regarding whether there is no charge to use buses in Aspen, this is the case for trips staying within the same fare zone within Aspen and on some routes it is also free to adjacent zones. However, for bus travel outside of these zones, fares range from \$2 to \$8 USD (\$3 to \$13 NZD). The flat fare in Queenstown is \$2 regardless of the distance travelled. As such I consider the existing bus fare structures to be similar.
12. It should also be noted that Aspen also has a number of exclusive bus lanes and High Occupancy Vehicle lanes that provide improved bus journey times and reliability. Bus services within Aspen City typically operate on 20 minute frequencies, with some at 10 minute frequencies. Therefore, there are many similarities of the Aspen bus network that is intended within the TPLM Variation and wider W2G initiatives to achieve mode shift including bus priorities and high frequency services. Other initiatives in operation in Aspen also include an e-bike sharing programme (called We-Cycle), a car share programme (called Car To Go), a car pool programme, a support programme for employers to help their staff to find better ways to work (called the Transportation Options Program), discounted bus passes, on demand transport services, end of trip cycle facilities and Transport Demand Management marketing. These measures have been identified for implementation by the W2G partners to achieve mode shift and were also initiatives identified within the TPLM Transport Strategy. Given the success of these measures to reduce car use in Aspen, I consider that these will also be effective in reducing car use as part of the TPLM Variation.

*Paragraph 32 – Please provide details of spreadsheet analysis of bus capacity as described in presentation to the Panel.*

13. At the presentation to the Panel, I explained that I prepared a calculation of predicted bus capacity at 2,400, 2,000, 1,800 and 1,100 residential units based on the earlier Panel questioning of the economics and urban design expert presentations to the Panel on 4 December 2023 relating to 2,000 and 1,800 residential units at TPLM Variation (with 1,100 also included in my assessment since this was the Strategic transport model baseline).
14. Below is a table summarising this assessment which uses the transport model AM and PM predicted peak hour bus flows for the 2,400 TPLM Variation units and Lake Hayes Estate (**LHE**) /Shotover Country (**SC**). This data is taken from Table 6.3.3 of Appendix C of my EIC, which I have then pro-rata for the 2,000, 1,800 and 1,100 units. I then calculated the hourly capacity of buses based on a 10 minute frequency

and a capacity of 40 seats (based on existing Queenstown bus vehicle seat numbers and I have assumed an additional 10 passengers standing). This results in the following bus capacity assessment:

No. units	AM TPLM Bus trips	PM TPLM Bus trips	AM LHE/ SC bus trips	PM LHE/ SC bus trips	No. buses in peak hour	Bus capacity	AM Pk Bus occupancy	PM Pk Bus occupancy
2400	386	445	323	365	12	600	118%	135%
2000	322	371	269	304	12	600	98%	113%
1800	290	334	242	274	12	600	89%	101%
1100	177	204	148	167	12	600	54%	62%

15. This indicates that with 2,400 and 2,000 units at TPLM, bus capacity will be exceeded and will be at or close to capacity with 1,800 units. Any lower than 1,800 units at TPLM will mean that buses will have excess capacity and will be unsustainable in terms of viability at the proposed level of high frequency (i.e. every 10 mins) bus service.

## Parking

*1.5 parking spaces for 3+ bed units – how can this be controlled through the provisions.*

16. I have discussed this with Mr Brown and we consider that developers will work out through their sales the number of spaces (i.e. 1 or 2 car park spaces) which will be provided for their 3+ bed units in order to achieve the overall average of 1.5 spaces for 3 + units across their site. Mr Brown is considering this further following questions from the Hearing Panel on 6 December.

*Reconsider parking standards for supermarket*

17. This is addressed in paragraph 10 (f) of Mr Brown's Summary of Evidence.

*Residents will park more vehicles than their off street provision*

18. I note that QLDC control parking on street through the Traffic and Parking Bylaw 2018 and this also prevents parking "off a roadway", and this includes the land considered to be berms. Control within the individual sections is more difficult to

enforce but I consider that the plot sizes are unlikely to provide the room to accommodate more cars than the parking provision.

## **Modelling**

*Confirm Sidra assumes 60 km/h speed limit.*

19. I confirm that the Sidra traffic signal assessments I have undertaken are based on a 60 km/h speed limit.

*The following questions for Mr Smith:*

- a) *Confirm with Mr Smith that 60 km/h speed limit required for urbanisation.*
- b) *Confirm with Mr Smith data used to validate strategic transport model base year and does this take into account 6% growth in observed traffic flows 2020 to 2023.*
- c) *Request Mr Smith to provide GEH stats from calibration/validation of base year strategic model.*
- d) *Re paragraph 36 of Mr Shields EIR - Since Tracks model is built using Census and household travel survey data, request Mr Smith comments on whether Tracks model can assess active modes.*
- e) *Request Mr Smith to provide details of school trips in the model for TPLM, Shotover Country and Lake Hayes Estate.*

20. **Appendix B** provides Mr Smith's response to these questions.

## **Monitoring**

*Re paragraph 38 of Mr Shields' EIR, how can monitoring of achievement of mode shares be incorporated into provisions eg no more development if targets not met? and is the ITA mechanism a suitable way to assess progress on mode shares ? Should specific ITA guidance be prepared or should Council take a leading role on monitoring?*

21. Provisions for monitoring are included in TPLM Variation Provisions 49.7.2 in relation to preparation of a Travel Demand Management Plan for residential buildings in the High Density Residential Precinct. Mr Brown and I will look into amendments of this provision to cover all development within TPLM. Mr Brown and I will also review amendments to the Provisions to incorporate the Panel's suggestion of including mode share monitoring and identifying remedial actions (should targets not be met) within Integrated Transport Assessments submitted as part of a Resource Consent application. This will be addressed in the Council's written reply.
22. Separately Mr Brown and I will also review the existing District Plan Chapter 29 (Transport) rules for High Traffic Generating Activities (**HTGA**). As detailed in

paragraph 30 of Mr Browns Summary, Rule 29.9 identifies thresholds for HTGA – we will review whether these thresholds should be amended for the TPLM Variation Provisions.

*Based on the transport model, identify a vehicle trip generation that would equate to the 20% PT modelled flows.*

23. As detailed in Table 6.3.3 of Appendix C of my EIC, the strategic transport model predicts the following AM, Interpeak (**IP**) and PM peak hour PT trips from the TPLM Variation which can be used as an equivalent vehicle trip:

	<b>AM Peak</b>	<b>Interpeak</b>	<b>PM Peak</b>
<b>TPLM In</b>	103	108	328
<b>TPLM Out</b>	283	88	117
<b>TPLM Total</b>	386	196	445

### **Anna Hutchinson Trust Land**

*Provide details of distances from the terraces to TPLM schools and commercial centre.*

24. Based on Figure 1 and Attachment A of Mr Barlett and Mr McKenzie’s EIC (dated 20 October 2023) I have measured the distance from the TPLM Variation Commercial Precinct to the upper terrace at its furthest point as 1.6km and to furthest point to the lower terrace of 2km. This equates to a walk time of 20 minutes and 25 minutes (upper and lower terrace respectively) which I do not consider to be a reasonable walk time. The closest distances from the upper and lower terraces to the commercial precinct would be 1.4km and 1.6km (upper and lower terrace respectively). This equates to a walk time of 17.5 minutes and 20 minutes (upper and lower terrace respectively) which I still do not consider to be a reasonable walk time.

25. Furthermore, these distances are in excess of the QLDC defined walkable catchment to shops and services of 600-800m and Ministry for the Environment (**MfE**) guidance on walkable catchments of up to 800m (as referenced in my response to question 19b of Reply to Submitters Questions dated 24 November). The distances of 1.6km and 2km would equate to approximately a 4 minute e-bike ride (or 6 minutes by conventional bike).

26. Based on Figure 1 and Attachment A of Mr Barlett and Mr McKenzie's EIC (dated 20 October 2023) I have measured the distance from the proposed bus stops on SH6 west of Stalker Road to the furthest point of the upper terrace as 990m and to the furthest point of the lower terrace of 1.4km. This equates to a walk time of 12.5 minutes and 17.5 minutes (upper and lower terrace respectively) which I do not consider to be a reasonable walk time to a bus stop. The closest distances from the upper and lower terraces to the bus stops would be 650m and 820m (upper and lower terrace respectively). This equates to a walk time of 8 minutes and 10 minutes (upper and lower terrace respectively) which I still do not consider to be a reasonable walk time since these distances are in excess of the 'industry norm' of a walk distance of 400 to 500m (5 minute walk time) to a bus stop. These distances (apart from the closest point of the upper terrace) are also in excess of QLDC defined walkable catchment to bus stops of 600-800m and MfE guidance on walkable catchments of up to 800m (as referenced in my response to question 19b of Reply to Submitters Questions dated 24 November).

### **TPLM Variation provisions**

*Consider back up provisions should the school(s) be delayed*

27. This is addressed in Paragraph 41 of Mr Brown's Summary of Evidence. Furthermore, Mr Brown and I will look into what alternative Transport Demand Management measures (e.g. school buses) would be possible to incorporate into the TPLM Variation Provisions. This will be addressed in the Council's written reply.

*Should a housing cap be included in the Provisions?*

28. This is addressed in paragraph 42 of Mr Brown's Summary of Evidence.

*Variation objectives and policies do not refer to mode shift*

29. This is included in 49.2.6.1 to 49.2.6.6 objective and policies and also in 49.1 Purpose Statement and in objective 27.3.24. I understand Mr Brown will also address this further in the Council's written reply.

*Does the Queenstown Business Case factor in the TPLM variation?*

30. As detailed subsequently by Mr Pickard's presentation to the Panel on 5 December, TPLM was anticipated within the Queenstown Business Case but unlikely to the scale as envisioned in the TPLM Variation.



*Identify key transport issues if Collector Road provided to the north (and including connection to Hutchinson land)*

31. As explained at the Panel presentation, from a transport perspective the key issues relating to providing the Collector Road to the north is that this will not be central to the development and may restrict pedestrian, cycle and vehicular access and connectivity within TPLM. Furthermore, should a decision be made in the future to route buses through the site, then moving the Collector Road to the north will mean that residents to the south of this will have further to walk to bus stops.
32. In respect of providing the Collector Road to the north and connecting to Hutchinson land, due to the level differences of the upper terrace of the Hutchinson land (of circa 20m) and on Lower Shotover Road, it would not be possible to do this. It is for this reason that Mr Barlett and Mr McKenzie's EIC dated (20 October 2023) showed an indicative alignment of roads with the TPLM Variation Collector Road realigned and extended southwards to provide a connection to the Hutchinson land via Spence Road (see extract below from Mr Barlett and Mr McKenzie's EIC, with the black dashed lines indicating their indicative roads).



*Review inclusion of NZUP works west of bridge in TPLM Variation provisions*

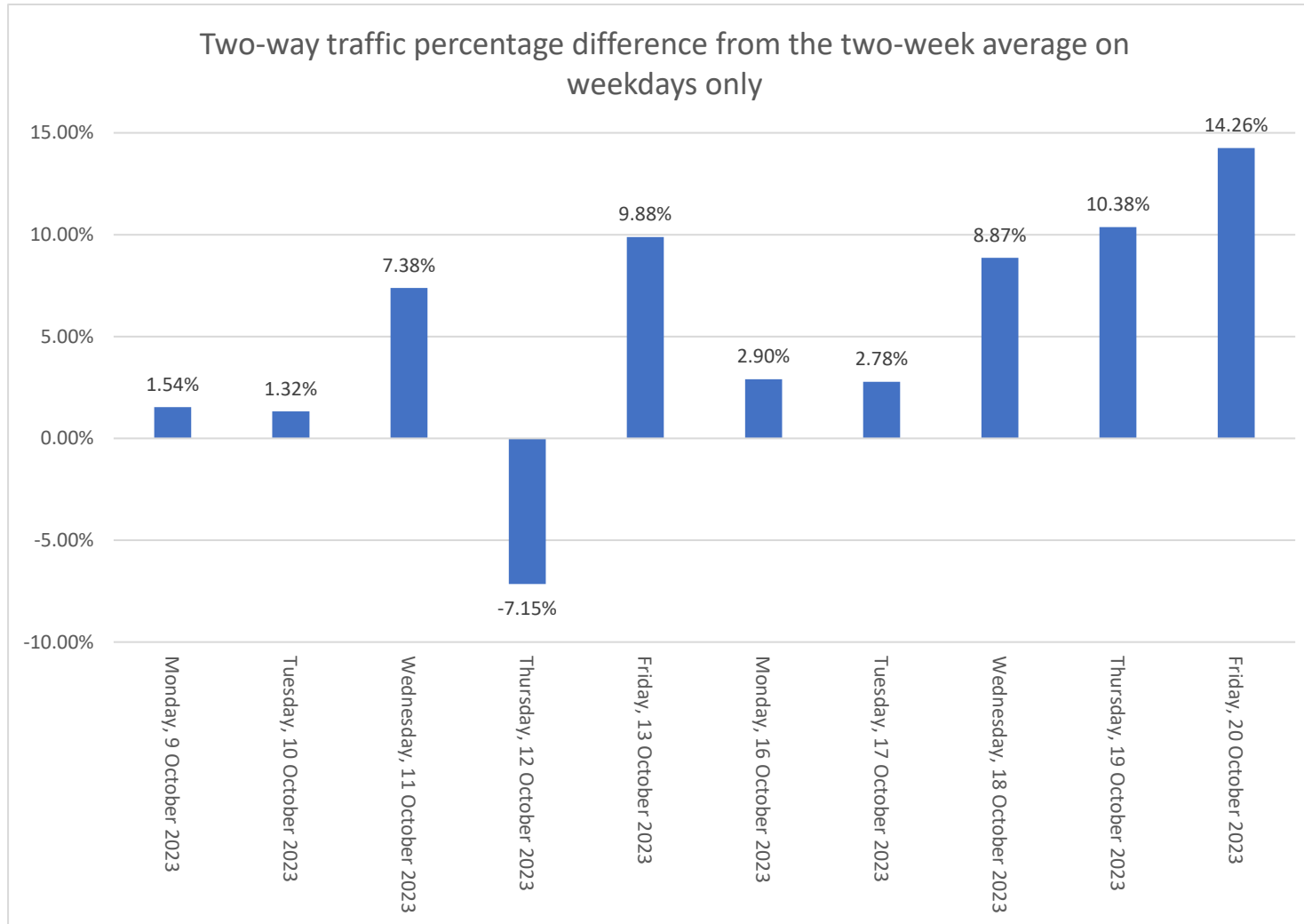
33. This is addressed in paragraph 13 of Mr Brown's Summary of Evidence. In addition the Stalker Road northbound bus lane will be incorporated into the SH6/Stalker Road intersection upgrade within the TPLM Variation Provisions.

*At Mr Brown's presentation 6 December, a question was raised relating to TPLM Variation provisions 49.5.33 and why is sub area A excluded from the list?*

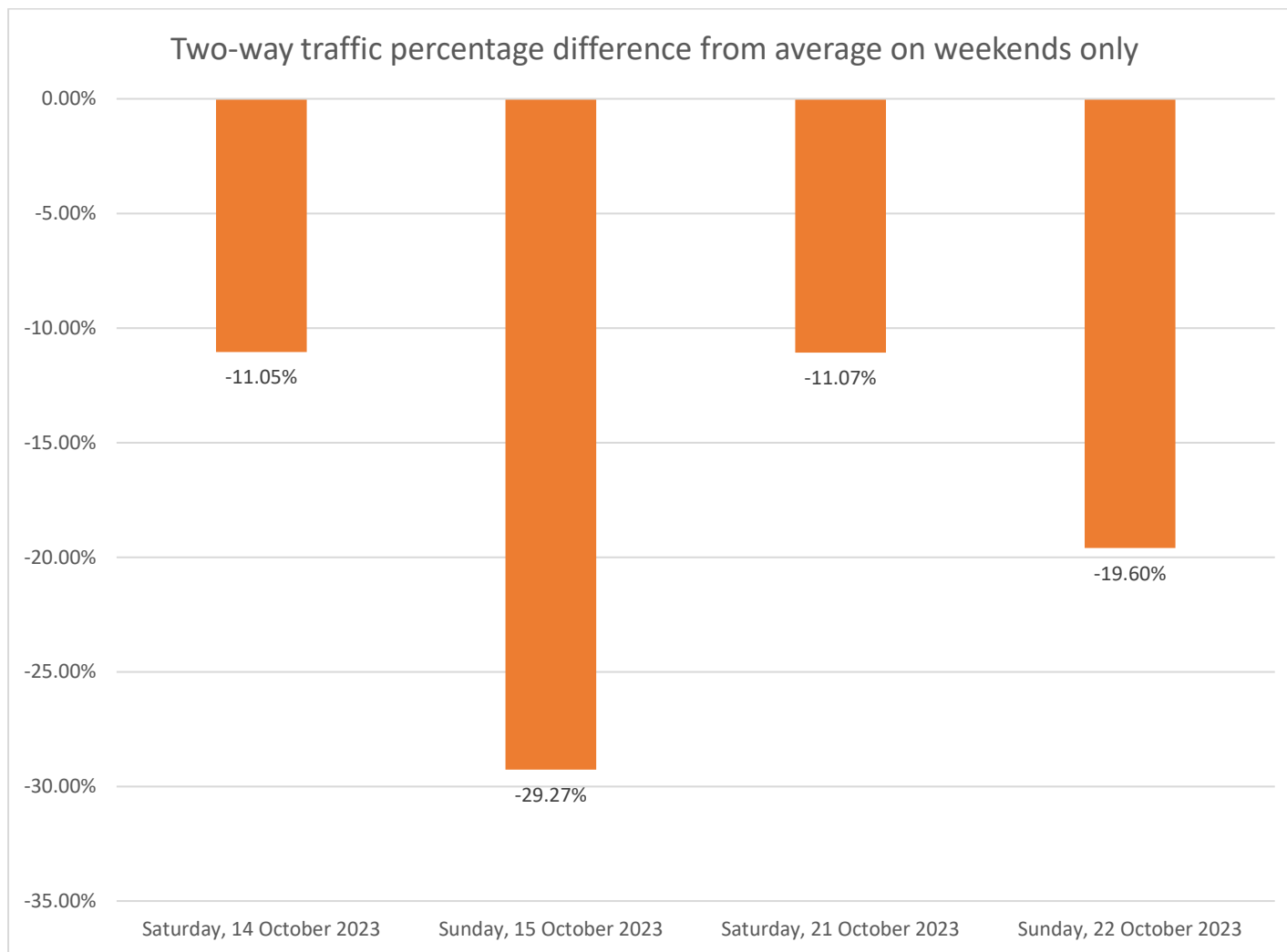
34. This is a typo and will be corrected in the updated TPLM Variation Provisions.

**APPENDIX A**

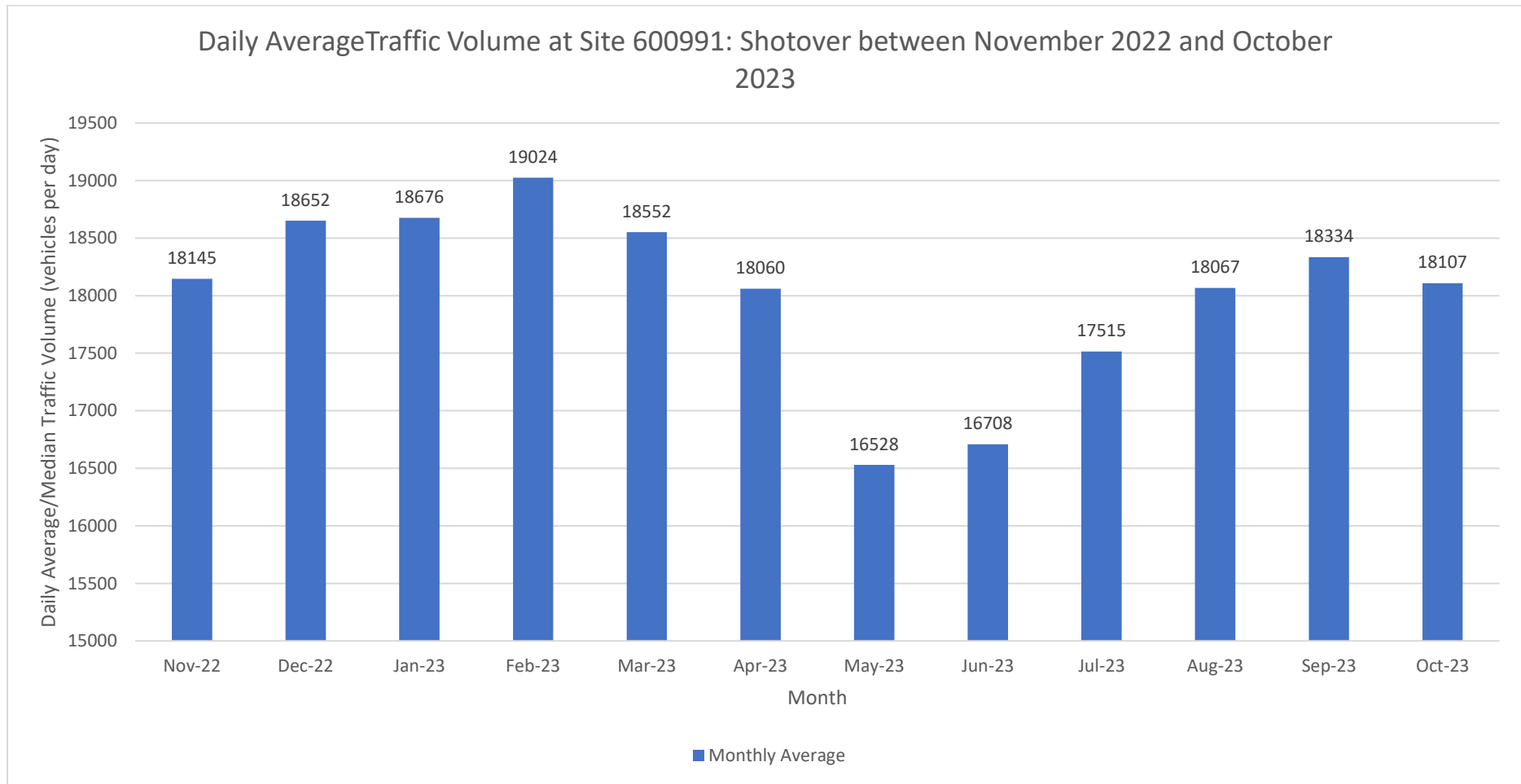
**Figure 1 – Weekday daily traffic flow % variation around the average daily traffic flow**



**Figure 2 – Weekend daily traffic flow % variation around the average daily traffic flow**



**Figure 3 Monthly variation of daily traffic flow November 2022 to October 2023**



## **APPENDIX B**

### **Responses from Mr Smith**

# Dave Smith response to TPLM Hearing Panel transportation questions

## Technical Note

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<b>Prepared for</b>	Colin Shields, Tonkin & Taylor; TPLM Hearing Panel
<b>Job Number</b>	NZTA-J321
<b>Revision</b>	A
<b>Issue Date</b>	06 December 2023
<b>Prepared by</b>	Dave Smith, Technical Director - Transportation Planning

## Hearing Panel Question Responses

Thank you for your email dated 5<sup>th</sup> December forwarding the modelling-related questions received from the Te Pūtahi Ladies Mile (TPLM) hearing panel for an initial response. These are addressed in turn below to include in your response to the panel.

1. Confirm with Mr Smith that 60 km/h speed limit required for urbanisation.

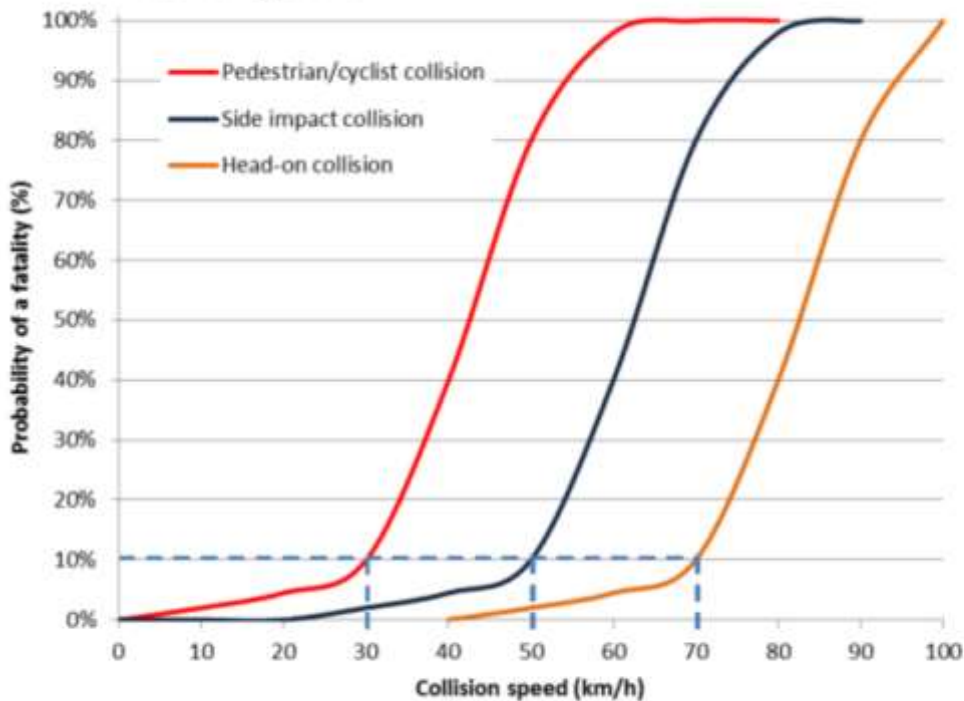
The key principle behind changing the corridor to a 60 km/h speed limit is related to road safety should traffic signals be installed. The likelihood of a side collision resulting in death is considerably higher if the collision speed occurred at 70 km/h (allowing for some reduction speed in braking for a vehicle travelling in an 80 km/h environment), compared to a collision speed of 50 km/h (allowing for a reduction from 60 km/h). The installation of signals greatly increases the potential for side impact collisions, for example as a result of red light running.

This reduced risk of a fatality that accompanies a reduction in collision speed, is demonstrated in the following diagram from the Austroads Guide to Road Safety Part 3. The likelihood of a side impact collision (the blue line) resulting in a fatality drops from approximately 80% to 10%.

Urbanising the SH6 corridor has an important role such that the highway is not just signposted at 60 km/h but also is interpreted by the driver to be consistent with a 60 km/h environment. Achieving this means that the design of the infrastructure (and corresponding design speed) matches the posted speed. If the environment were too rural in nature then drivers are more likely to drive as they would in a more rural environment with higher operating speeds irrespective of the posted speed.

As such it is not the speed limit that is required for urbanisation. Instead it is the urbanisation of the corridor that is required to be consistent with a much safer 60 km/h environment.

**Figure 2.6: Relationships between a motorised vehicle collision speed and probability of a fatality for different crash configurations**



Source: Jurewicz et al. (2015a) and based on Wramborg (2005)

2. Confirm with Mr Smith data used to validate strategic transport model base year and does this take into account 6% growth in observed traffic flows 2020 to 2023.

The full reporting of the model validation performance is appended to this technical note as Attachment A. The Waka Kotahi Transport Model Development Guidelines have been applied in accordance with industry best practice.

The modelled growth in traffic activity between 2018 and 2024 with no mode shift away from vehicle driver trips to public transport is summarised below:

**Table 0.1 Modelled growth 2018-2024**

Metric	2018	2024	Growth
8-9am peak hour trips	16092	19890	23.6% (3.9% pa)
12-1pm interpeak trips	15403	18833	22.2% (3.7% pa)
5-6pm peak hour trips	21291	26102	22.6% (3.8% pa)

3. Request Mr Smith to provide GEH stats from calibration/validation of base year strategic model.

This is appended to this technical note for the full base year model validation as Attachment B. Of note is the following count:

- SH6 east of Lower Shotover Road (Cordon Number 12 count 4) with GEHs of 0.6 and 1.5 (morning); 1.7 and 2.5 (interpeak); and 0.2 and 1.3 (evening peak).



4. Re paragraph 36 of Mr Shields EIR - Since Tracks model is built using Census and household travel survey data, request Mr Smith comments on whether Tracks model can assess active modes.

No it does not assess active modes. Neither the Tracks model or the WSP bespoke PT model used in the TPLM assessment assume any mode shift relating to active modes.

5. Request Mr Smith to provide details of school trips in the model for TPLM, Shotover Country and Lake Hayes Estate.

School trips are represented in the model by including community and education jobs as a land use variable with the number of jobs added to the corresponding transport model zone where the school is situated. For the future forecast scenarios including TPLM, it was assumed that there is one employee for every 15 students at TPLM schools which corresponds well with actual school land use data.

There is a trip purpose in the trip generation phase of the model which is applied to generate home based other/education trips as a combined trip purpose. This means that the school trips are aggregated with other trips such as shopping and recreational trips. On this basis I acknowledge that the model does not provide a sophisticated representation of school-based travel, and as a result these cannot be isolated from the model from some other home-based trips.

**Auckland**

Level 1/70 Shortland Street  
Auckland 1010  
Aotearoa New Zealand

**Wellington**

Level 1/119-123 Featherston Street  
Wellington 6011  
Aotearoa New Zealand

**Christchurch**

Level 1/137 Victoria Street  
PO Box 36446, Merivale  
Christchurch 8146  
Aotearoa New Zealand

**hello@abley.com**

**+64 3 377 4703**

**abley.com**

**ATTACHMENT A**  
**Base Year Model Validation**

### 3. Base Year Validation

The updated 2018 'Summer' models have been validated against available traffic counts to ensure it is appropriately validated across all count locations and matches observed volumes across a selection of screenlines. Travel time validation on key corridors of the model has also been undertaken.

The NZ Transport Agency has released Transport Model Development Guidelines (TMDG) (1st edition amendment 01 effective from 01 September 2019) to support the development and validation of transport models and the purpose category (Category A) has been used to establish suitable validation thresholds in this model update.

#### 3.1 Individual Traffic Count Validation

##### Observed vs Modelled Count XY Scatter Plots (section 5.5 of TMDG)

The traffic counts used in the model validation have been combined into scatter plots comparing modelled and observed flows to determine the goodness of fit. The TMDG required that the line of best fit should have an  $R^2$  values greater than 0.85 and the equation within the range of  $y=0.9x$  to  $y=1.1x$ . The morning peak, interpeak and evening peak scatter plots are shown below. Lines that are plus and minus 30% are shown for reference. The modelled flows are on the y-axis and the observed flows on the x-axis.

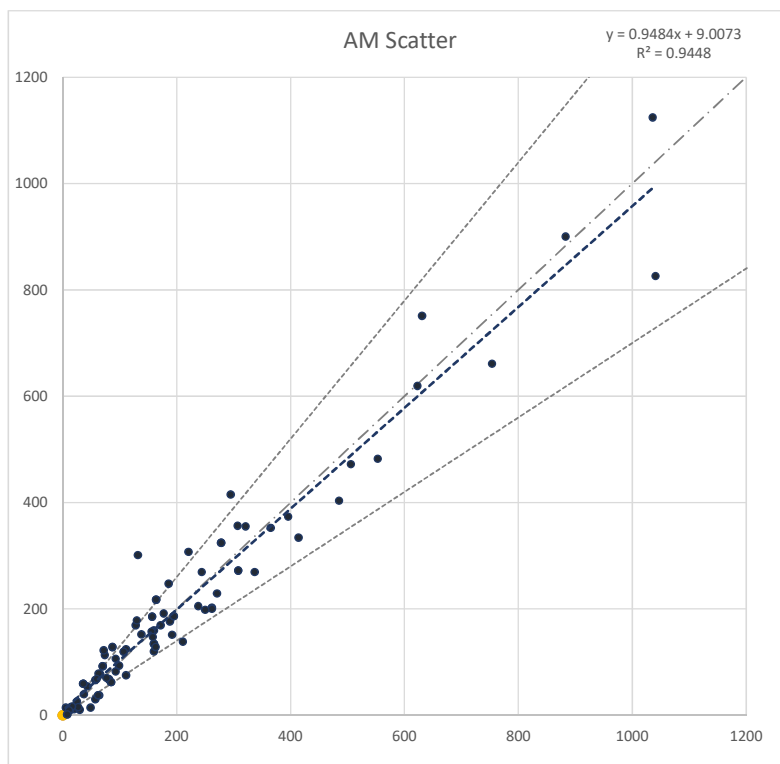


Figure 3.1 Morning Peak Scatter Plot

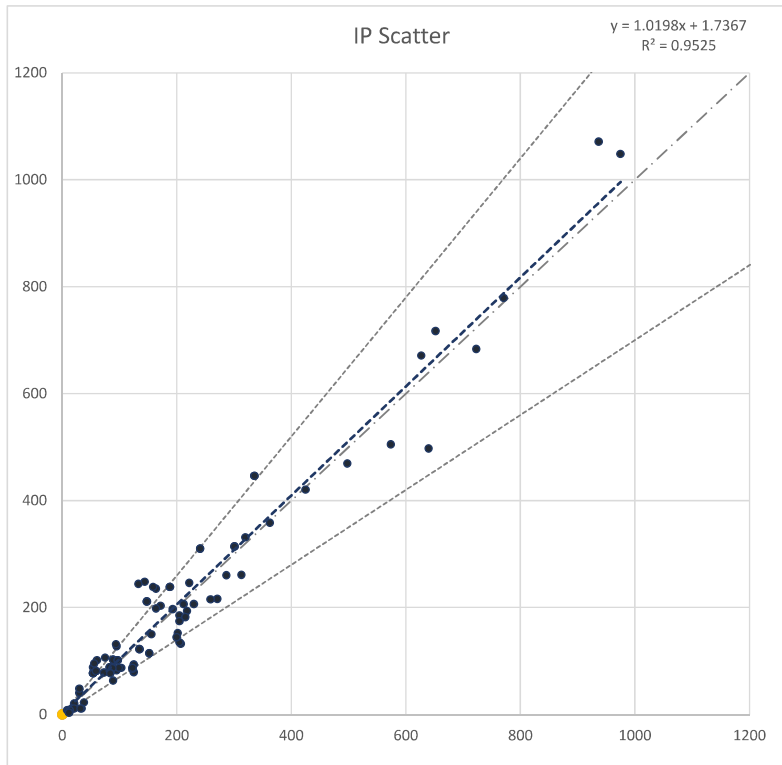


Figure 3.2 Interpeak Scatter Plot

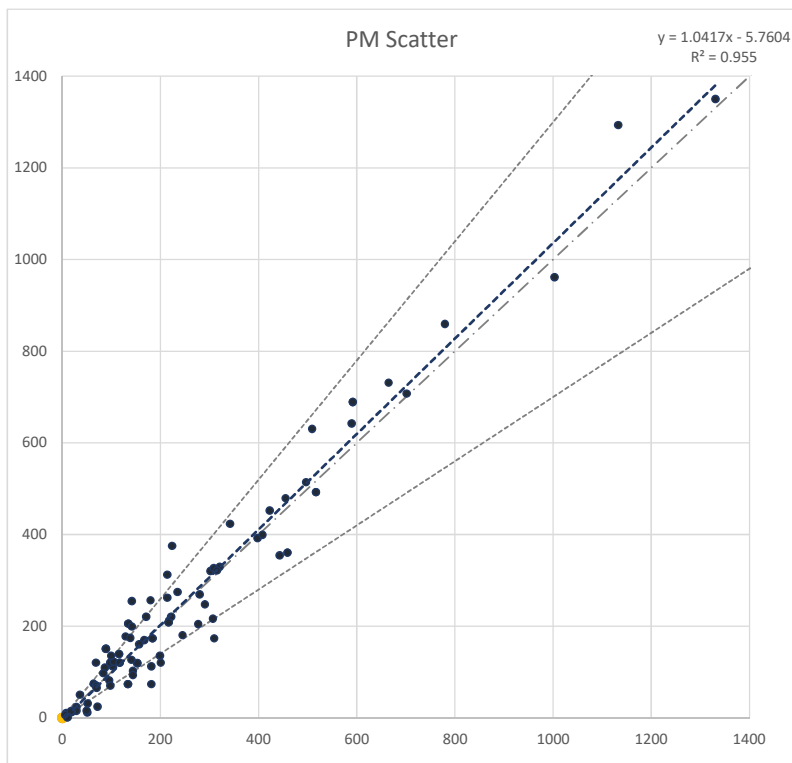


Figure 3.3 Evening Peak Scatter Plot

**Table 3-1 Overall Scatter Plot goodness of fit (based on 47 two-way count observations)**

Period	Slope	R <sup>2</sup>
<b>Criteria</b>	0.9 to 1.1	> 0.85
<b>AM</b>	0.948	0.945
<b>IP</b>	1.020	0.953
<b>PM</b>	1.041	0.955

The scatter plots demonstrate the line of best fit and R<sup>2</sup> value from each of the peak periods is within the guidelines set by the TMDG. There are 94 observations in this validation comparison across 47 two-way count sites spread throughout the District. There are some counts outside of the +/-30% lines and effort has been put into the validation phase to limit this occurring in the area that would be influenced by the current public transport serviced area and key traffic generation areas such as the wider Frankton Flats area and Wakatipu Basin. Noting that many of the counts are lower in volume and are more susceptible to flow discrepancy pushing beyond the 30% lines. However, this could be addressed if needed through local area validation on a project-by-project basis as required.

#### **Observed vs Modelled Count Root Mean Square Error (section 5.6 of TMDG)**

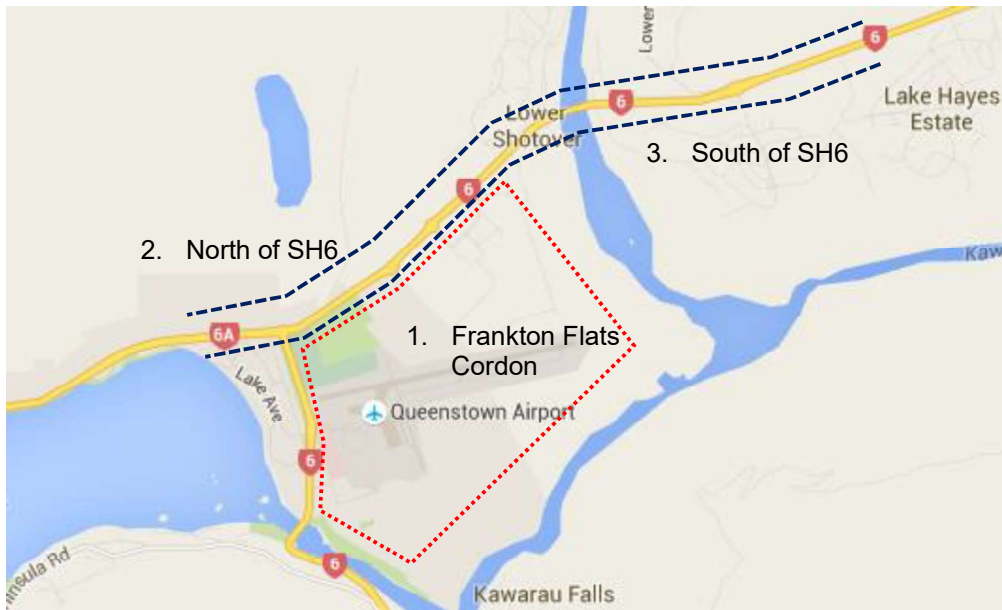
The RMSE across all counts is considered acceptable if this metric is less than 30% or requires clarification if below 40%. For each period model the RMSE is:

- 25.59% for AM Peak model;
- 23.16% for Interpeak model; and
- 23.23% for PM Peak model.

The RMSE statistic for all three periods is below 30% as required.

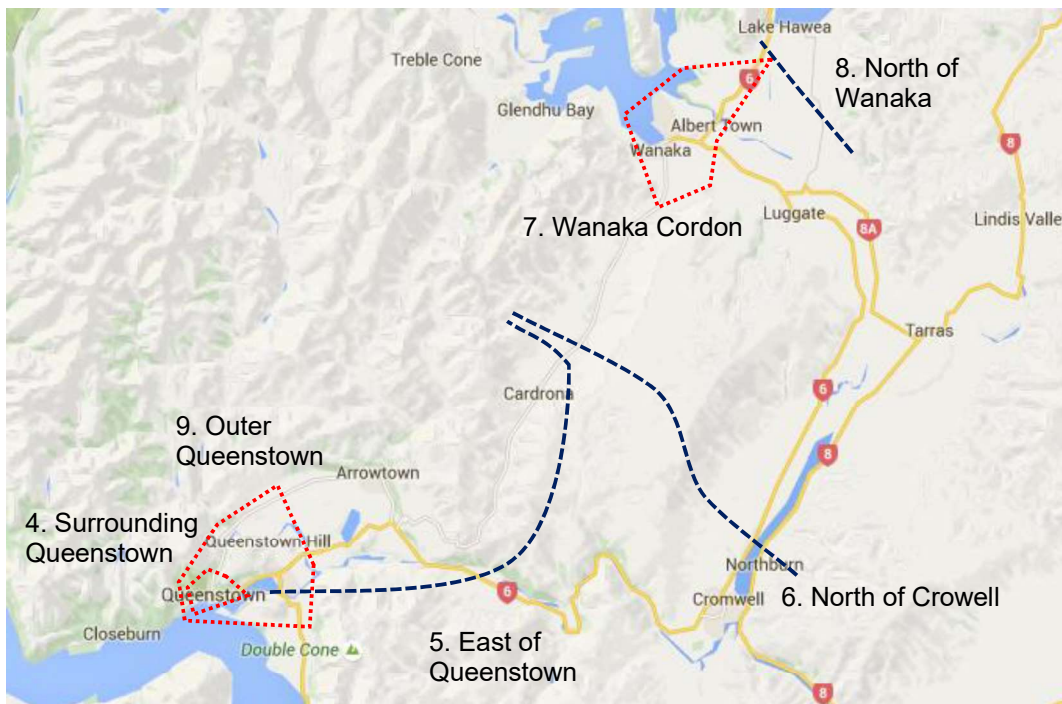
### **3.2 Screenline Validation**

The model has been validated against existing traffic count data across the wider modelled area. There are three screenlines in and around Frankton as are shown in Figure 3.4.



**Figure 3.4 Frankton Screenlines**

There are regional screenlines and other township cordons included in the validation process and these are shown in Figure 3.5.



**Figure 3.5 Regional and Other Screenlines**

## Screenline Statistics

The key screenline statistics for the Frankton Flats screenlines 1-3 are shown in Table 3-2, Table 3-3 and Table 3-4 highlighting the directional count volumes compared with the modelled count volume and the GEH based goodness-of-fit statistic. The screenline statistics for regional and other screenlines 4-9 are shown in Table 3-5 to Table 3-10 highlighting the directional count volumes compared with the modelled count volume and the GEH based goodness-of-fit statistic. The full screenline outputs are provided in Appendix A. For reference the screenlines with count locations and other spot counts are shown spatially in the figures in Appendix B.

**Table 3-2 Screenline Statistics 1. Frankton Flats Cordon (6 counts)**

Period	Value	Inbound	Outbound	Total
<b>AM</b>	Count	1635	909	2544
	Model	1589	855	2444
	GEH	1.1	1.8	2
<b>IP</b>	Count	1496	1517	3011
	Model	1508	1486	2994
	GEH	0.3	0.8	0.3
<b>PM</b>	Count	1481	2037	3519
	Model	1423	2179	3602
	GEH	1.5	3.1	1.4

**Table 3-3 Screenline Statistics 2. North of SH6 (3 counts)**

Period	Value	Southbound	Northbound	Total
<b>AM</b>	Count	350	219	569
	Model	303	211	514
	GEH	2.6	0.5	2.4
<b>IP</b>	Count	211	228	439
	Model	202	199	401
	GEH	0.6	2	1.9
<b>PM</b>	Count	232	246	478
	Model	263	338	601
	GEH	2	5.4	5.3



**Table 3-4 Screenline Statistics 3. South of SH6 (9 counts)**

Period	Value	Southbound	Northbound	Total
<b>AM</b>	Count	1941	1559	3500
	Model	2018	2011	4029
	GEH	1.7	10.7	8.6
<b>IP</b>	Count	1919	1846	3766
	Model	2147	2151	4298
	GEH	5.1	6.8	8.4
<b>PM</b>	Count	2542	2543	5083
	Model	2618	2800	5418
	GEH	1.5	5	4.6

**Table 3-5 Screenline Statistics 4. Surrounding Queenstown (6 counts)**

Period	Value	Southbound	Northbound	Total
<b>AM</b>	Count	2209	1713	3923
	Model	2181	1413	3594
	GEH	0.6	7.6	5.4
<b>IP</b>	Count	1740	1628	3367
	Model	1834	1821	3655
	GEH	2.2	4.6	4.9
<b>PM</b>	Count	2415	2346	4763
	Model	2167	2546	4713
	GEH	5.2	4.0	0.7

**Table 3-6 Screenline Statistics 5. East of Queenstown (3 counts)**

Period	Value	Southbound	Northbound	Total
<b>AM</b>	Count	942	613	1554
	Model	891	521	1412
	GEH	1.7	3.9	3.7
<b>IP</b>	Count	750	701	1452
	Model	747	743	1490
	GEH	0.1	1.6	1.0
<b>PM</b>	Count	780	1030	1810
	Model	896	1135	2031
	GEH	4.0	3.2	5.0

Table 3-7 Screenline Statistics 6. North of Cromwell (3 counts)

Period	Value	Southbound	Northbound	Total
AM	Count	389	277	666
	Model	335	287	622
	GEH	2.8	0.6	1.7
IP	Count	361	362	723
	Model	295	299	594
	GEH	3.6	3.5	5.0
PM	Count	439	446	884
	Model	381	351	732
	GEH	2.9	4.8	5.3

Table 3-8 Screenline Statistics 7. Wanaka Cordon (6 counts)

Period	Value	Southbound	Northbound	Total
AM	Count	451	410	860
	Model	547	345	892
	GEH	4.3	3.3	1.1
IP	Count	474	478	953
	Model	433	416	849
	GEH	1.9	2.9	3.5
PM	Count	651	658	1309
	Model	451	654	1105
	GEH	8.5	0.2	5.9

Table 3-9 Screenline Statistics 8. North of Wanaka (2 counts)

Period	Value	Southbound	Northbound	Total
AM	Count	177	96	273
	Model	196	71	267
	GEH	1.4	2.7	0.4
IP	Count	146	165	311
	Model	130	122	252
	GEH	1.4	3.6	3.5
PM	Count	161	236	397
	Model	129	220	349
	GEH	2.7	1.1	2.5

**Table 3-10 Screenline Statistics 9. Outer Queenstown (5 counts)**

Period	Value	Southbound	Northbound	Total
<b>AM</b>	Count	1719	1167	2886
	Model	1782	1009	2791
	GEH	1.5	4.8	1.8
<b>IP</b>	Count	1333	1336	2670
	Model	1311	1294	2605
	GEH	0.6	1.2	1.3
<b>PM</b>	Count	1612	1825	3438
	Model	1451	1799	3250
	GEH	4.1	0.6	3.3

Overall, the results demonstrate that the model is largely consistent with observed traffic counts across the screenlines throughout the district. There are some anomalies in some periods but this is to be expected as the model covers a large geographic area and needs to reflect both regional and local traffic patterns. The south of SH6 screenline has been affected by the count on Stalker Road as it is located deep within the subdivision instead of just south of the highway. The zonal layout means either a lot or very little traffic will pass over this link. This made it difficult to validate the overall balance of flows from the largely residential area. With effects of congestion not reflected well the route choice in Frankton is potentially affected as some traffic will be rat running to avoid extensive queueing that occurs. In the AM there is not a lot of choice to deal with westbound queues on the Shotover Bridge but there is more route choice in the PM peak. This may provide reasoning why the PM has a poorer fit with GEH values on the south of SH6 screenline than the other periods.

### **Observed vs Modelled Hourly Link GEH Comparisons (Section 5.3 of TMDG)**

The TMDG purpose type A requirements for all screenlines in terms of total GEH is for 60% of screenlines to have a GEH value less than 5.0, 75% of screenlines to have a GEH value less than 7.5 and 90% of screenlines to have a GEH value less than 10.0. The comparison of the modelled screenlines against these criteria is shown in Table 3-11 and this demonstrates that the model exceeds these requirements.

**Table 3-11 Overall screenline goodness of fit (based on 18 directions)**

Period	% of GEH < 5.0	% of GEH < 7.5	% of GEH < 10.0
<b>Criteria</b>	> 60%	> 75%	> 90%
<b>AM</b>	90%	90%	95%
<b>IP</b>	90%	100%	100%
<b>PM</b>	95%	100%	100%

Individual count validation on the screenlines is also recommended in the TMDG, and requires that on each screenline 65% of GEH values are less than 5.0, 75% of GEH values are less than 7.5, 85% of GEH values are less than 10 and 95% of GEH values are less than 12. The comparison of the

modelled screenlines against these criteria is shown in Table 3-12 with criteria met for each period and screenline.

**Table 3-12 Individual screenline goodness of fit**

Screenline	AM Peak				Interpeak				PM Peak			
	<5	<7.5	<10	<12	<5	<7.5	<10	<12	<5	<7.5	<10	<12
Criteria (GEH of counts on screenline less than)												
<b>Target</b>	<b>65%</b>	<b>75%</b>	<b>85%</b>	<b>95%</b>	<b>65%</b>	<b>75%</b>	<b>85%</b>	<b>95%</b>	<b>65%</b>	<b>75%</b>	<b>85%</b>	<b>95%</b>
<b>1 Frankton Cordon (12)</b>	100%	100%	100%	100%	83%	100%	100%	100%	75%	100%	100%	100%
<b>2 North of SH6 (6)</b>	83%	100%	100%	100%	100%	100%	100%	100%	83%	100%	100%	100%
<b>3 South of SH6 (18)</b>	83%	94%	94%	100%	83%	100%	100%	100%	72%	100%	100%	100%
<b>4 Queenstown Cordon (12)</b>	92%	100%	100%	100%	100%	100%	100%	100%	83%	92%	100%	100%
<b>5 East of Queenstown (6)</b>	100%	100%	100%	100%	100%	100%	100%	100%	83%	100%	100%	100%
<b>6 North of Cromwell (3)</b>	100%	100%	100%	100%	67%	100%	100%	100%	83%	100%	100%	100%
<b>7 Wanaka Cordon (12)</b>	100%	100%	100%	100%	100%	100%	100%	100%	75%	100%	100%	100%
<b>8 North of Wanaka (4)</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>9 Outer Queenstown (10)</b>	90%	100%	100%	100%	100%	100%	100%	100%	70%	90%	100%	100%

Note: Count observations in brackets next to screenline name

Overall, the model aligns with the criteria and in many cases all counts on separate screenlines having a GEH less than 5.0 with the requirement being on 65%. Screenline 6 has one rural location on SH6 between Cromwell and Wanaka where GEH values were just over a value of five in both directions in the interpeak and in one in the evening peak. Because this screenline has only 3 counts this affects the overall percentage adversely with 67% directional counts under 5.0 GEH value being reported. The other counts on the screenline are generally a good fit and the screenline is considered to have better fit than this value suggests. It is not in a critical location for the QTPBC but could be looked into for other project work if needed.

While the evening peak period meets the requirements for model validation it does not perform as well as the other periods in the criteria for GEH being under a value of five for counts within a screenline reported in Table 3-12. The model and outputs have been looked into for why this might be the case but there doesn't appear to be a particular reason. Some relate to the counts near the BP roundabout where transferring traffic to an adjacent road to address two counts would adversely affect the validation in the other periods. Some also relate to the potential mismatch in route choice with queuing more significant in the PM peak. The model trip generation is informed by an Auckland HIS from 1999 and there might be slightly more discrepancy in trip making in the evening peak compared to the other periods acknowledging the near 20 year difference. However, given the model validation results are

favourable across all periods the level of fit is considered to be satisfactory for the purpose of the QTPBC. It is advised that local checks are undertaken in the QTPBC to determine if any adjustments are needed for the adopted methodology of the QTPBC.

### Observed vs Modelled Hourly Link Count Band Comparison (section 5.4 of TMDG)

The TMDG Purpose Type A requirements for all screenlines in screenline count bands is for greater than 70% of screenlines to be within 10% and greater than 80% of screenlines within 15%. The comparison of the modelled counts against these criteria is shown in Table 3-13 and there are some issues meeting these thresholds. The model is closer to meeting the “within 15%” threshold with the interpeak model right on the threshold with 80% of screenline directional totals within 15% of the count total.

Many of the counts are low in volume and changes in volume appear to push the total screenline difference over the thresholds particularly when the total flow across a screen line is low. For example, one of the screenline directions has a count of 177 and the model is just 11% high but the GEH for this is very good at 1.4. Another screenline direction has a count of 389 and the model is 14% high but the GEH for this is still good at 2.8. The high variability of seasonal counts is likely to be affecting the fit to these criteria also.

With the high number of lower volume counts the goodness of fit is better informed by the GEH statistic as the two examples demonstrate in the preceding paragraph. The link band validation is still reported but in this case we prefer the GEH as a measure of goodness of fit as it better accounts for a mixture of low and high volume counts and the variation from the model to observed values.

Table 3-13 Overall screenline goodness of fit to link bands

Period	% of screenlines within 10%	% of screenlines within 15%
<b>Criteria</b>	> 70%	> 80%
<b>AM</b>	45%	65%
<b>IP</b>	55%	80%
<b>PM</b>	40%	70%

The TMDG Purpose Type A requirements for all individual link counts on screenlines bands is for greater than 70% of counts over 700vph to be within 100vph, counts between 700vph and 2700vph to be within 15% and counts over 2700vph to be within 400vph. The comparison of the modelled counts against these criteria is shown in Table 3-14 and this demonstrates that the model exceeds these requirements.

Table 3-14 Individual screenline count goodness of fit to link bands

Period	% of counts under 700vph within 100vph	% of counts btwn 700-2700vph within 15%	% of counts over 2700vph within 400vph
<b>Criteria</b>	> 70%	> 70%	> 70%
<b>AM</b>	97%	75%	n/a
<b>IP</b>	94%	100%	n/a
<b>PM</b>	94%	100%	n/a

Overall the model is considered to reflect observed counts well even with the low threshold meeting for the overall screenline bands particularly in light of the overall GEH thresholds reported in the previous section and that individually the band criteria is met very well.

### 3.3 Travel Time Validation

A bluetooth system is set up to extract travel times on key corridors of the road network. The Purpose Type A validation criteria are for 80% of journeys to be within 15% or one minute (if higher) and for 85% of journeys to be within 25% or 1.5 minutes (if higher). The routes are shown in the figure below.



Figure 3.6 Queenstown-Frankton detector locations

A comparison between the observed and modelled journey times is shown in Table 3-15 to Table 3-17 for the three hours modelled. Further discussion outside of this reporting has highlighted that mean observed travel times were not available from the Bluetooth data at the granularity required for the model validation comparison. The only measure available to compare to the hourly modelled travel times is the upper and lower 10<sup>th</sup> percentiles. Comparing how the modelled times fit within this range instead is consistent with the previous base model validation for the Business Case work.

Table 3-15 Travel Time Validation Reporting AM Peak Hour

Route Segment Description	BT end points	Observed 10%ile	Modelled Time	Observed 90%ile	OK?
1 SH6inc LHayes to 5Mile	V to U	121	144	169	OK
2 SH6inc 5Mile to BP	U to R	80	112	118	OK
3 SH6inc BP to Airport	R to S	42	63	116	OK
4 SH6inc Airport to PenRd	S to T	159	98	550	Too fast

5 SH6dec PenRd to Airport	T to S	161	106	506	Too fast
6 SH6dec Airport to BP	S to R	49	76	127	OK
7 SH6dec BP to 5Mile	R to U	73	109	119	OK
8 SH6dec 5Mile to Lhayes	U to V	122	119	163	Too fast
9 SH6Ainc BP to Dublin	R to O	338	379	423	OK
10 SH6Ainc Dublin to Stanley	O to N	69	71	200	OK
11 SH6Ainc Stanley to FrnsdRbt	N to M	163	200	273	OK
12 SH6Adec FrnsdRbt to Stanley	M to N	185	186	410	OK
13 SH6Adec Stanley to Dublin	N to O	62	84	112	OK
14 SH6Adec Dublin to BP	O to R	353	368	478	OK
15 GorgeNB Stanley to Hlnstn	N to P	59	96	300	OK
16 GorgeNB FrnsdRbt to Hlnstn	M to P	214	247	514	OK
17 GorgeNB Hlnstn to Indstl	P to Q	46	56	90	OK
18 GorgeSB Indstl to Hlnstn	Q to P	49	58	79	OK
19 GorgeSB Hlnstn to Stanley	P to N	74	82	305	OK
20 GorgeSB Hlnstn to FrnsdRbt	P to M	227	253	402	OK

**Table 3-16 Travel Time Validation Reporting Interpeak Hour**

Route Segment Description	BT end points	Observed 10%ile	Observed 90%ile	Modelled Time	OK?
1 SH6inc LHayes to 5Mile	V to U	121	139	174	OK
2 SH6inc 5Mile to BP	U to R	82	113	126	OK
3 SH6inc BP to Airport	R to S	42	60	120	OK
4 SH6inc Airport to PenRd	S to T	165	100	592	Too fast
5 SH6dec PenRd to Airport	T to S	166	106	512	Too fast
6 SH6dec Airport to BP	S to R	54	75	148	OK
7 SH6dec BP to 5Mile	R to U	74	113	123	OK
8 SH6dec 5Mile to Lhayes	U to V	121	124	159	OK
9 SH6Ainc BP to Dublin	R to O	347	375	550	OK
10 SH6Ainc Dublin to Stanley	O to N	93	70	346	Too fast

11 SH6Ainc Stanley to FrnsdRbt	N to M	187	208	323	OK
12 SH6Adec FrnsdRbt to Stanley	M to N	225	181	447	Too fast
13 SH6Adec Stanley to Dublin	N to O	62	86	120	OK
14 SH6Adec Dublin to BP	O to R	351	387	513	OK
15 GorgeNB Stanley to Hlnstn	N to P	63	98	488	OK
16 GorgeNB FrnsdRbt to Hlnstn	M to P	246	243	534	Too fast
17 GorgeNB Hlnstn to Indstl	P to Q	46	56	94	OK
18 GorgeSB Indstl to Hlnstn	Q to P	49	57	90	OK
19 GorgeSB Hlnstn to Stanley	P to N	76	82	318	OK
20 GorgeSB Hlnstn to FrnsdRbt	P to M	239	260	444	OK

**Table 3-17 Travel Time Validation Reporting PM Peak Hour**

Route Segment Description	BT end points	Observed 10%ile	Observed 90%ile	Modelled Time	OK?
1 SH6inc LHayes to 5Mile	V to U	119	138	156	OK
2 SH6inc 5Mile to BP	U to R	81	116	122	OK
3 SH6inc BP to Airport	R to S	42	62	97	OK
4 SH6inc Airport to PenRd	S to T	124	103	238	Too fast
5 SH6dec PenRd to Airport	T to S	141	107	260	Too fast
6 SH6dec Airport to BP	S to R	53	90	141	OK
7 SH6dec BP to 5Mile	R to U	74	115	128	OK
8 SH6dec 5Mile to Lhayes	U to V	121	130	163	OK
9 SH6Ainc BP to Dublin	R to O	330	387	441	OK
10 SH6Ainc Dublin to Stanley	O to N	98	121	227	OK
11 SH6Ainc Stanley to FrnsdRbt	N to M	187	221	302	OK
12 SH6Adec FrnsdRbt to Stanley	M to N	187	179	313	Too fast
13 SH6Adec Stanley to Dublin	N to O	63	115	120	OK
14 SH6Adec Dublin to BP	O to R	331	399	431	OK
15 GorgeNB Stanley to Hlnstn	N to P	59	98	287	OK
16 GorgeNB FrnsdRbt to Hlnstn	M to P	224	247	397	OK



17 GorgeNB Hlnstn to Indstl	P to Q	45	57	85	OK
18 GorgeSB Indstl to Hlnstn	Q to P	48	57	90	OK
19 GorgeSB Hlnstn to Stanley	P to N	77	80	225	OK
20 GorgeSB Hlnstn to FrnsdRbt	P to M	231	272	358	OK

Most of the journey times sit within the upper and lower observed 10<sup>th</sup> percentiles however some observed times are difficult to replicate in a strategic model particular during the evening peak as the observed delays are very significant. The existing evening peak congestion and associated travel times northbound on Kawarau Road have been difficult to calibrate without adversely affecting the other periods or transferring too much traffic onto alternative routes such as McBride Street and Yewlett Crescent in the vicinity of SH6/6A intersection. The other area proving difficult is the Queenstown Town Centre where there are many interactions that slow traffic such as parking, zebra crossings and delays at traffic signals. The new Kawarau Falls bridge was being constructed during the modelled period but has been coded into the model as built as it is unlikely the effects of construction could have been reflected. The times along these routes (3 & 4) are much faster in the model than observed as a result. With this in mind there is just one route in the morning and evening peaks that is too fast out of 18 and three in the interpeak.

Subsequently, as the model is under-representing delays in some locations, the modelling provides a highly conservative analysis in the base year. This should be taken into consideration when interpreting the evaluation of travel times and corresponding benefits in subsequent project work. For the QPTPBC the modal split and mode shift potential will not rely on the Strategic model and thus any underrepresentation of travel times is not likely to have a major bearing as it might have in a standard four stage public transport based strategic model.

### 3.4 Model Convergence

All three period models have been converged until there is no difference between the output statistics on the penultimate and final model runs. The key model statistics are presented in Table 3-18 and this is in line with the expectation of this type of model set out in NZTA's TMDG.

Table 3-18 2018 Base Model Convergence

Indicator	Final Run	Penultimate Run	Difference
<b>AM Peak</b>			
Trips Total	16092	16092	0.0
Vehicle Minutes	193506	193515	-8.6
Vehicle Kilometres	153876	153878	-1.5
Ave Trip Length (min)	12.03	12.03	0
Ave Trip Length (km)	9.56	9.56	0
Intrazonal Trips	2134	2134	0
<b>Interpeak</b>			
Trips Total	15403	15403	0.0
Vehicle Minutes	194576	194591	-15.6

**ATTACHMENT B**

**Base Year GEH Individual Count Reporting**

```

+-----+
| TRACKS TRACKS TRACKS TRACKS TRACKS TRACKS TR |
| TRACKS +-----+ TRACKS |
| S TRACKS |          | S TRACKS |
| KS TRACK | Program :   CORDON | KS TRACK |
| CKS TRAC | Version :   V7.08  | CKS TRAC |
| ACKS TRA |          | ACKS TRA |
| RACKS TR | Date run : 23-AUG-22 | RACKS TR |
| TRACKS T | Time run : 16:48:26 | TRACKS T |
| TRACKS | Platform : Win 95/NT | TRACKS |
| S TRACKS+-----+S TRACKS |
| KS TRACKS TRACKS TRACKS TRACKS TRACKS TRACKS |
+-----+
|          TRACKS Licenced to          |
|          |                          |
|          at : Abley Christchurch      |
+-----+
|          Build Date : 11/12/12 07:32 |
|          Parameter version : V5.20    |
+-----+

```

Network Period Factor : 1.000

Cordon Period Factor : 1.000

GEH Period Factor : 1.000

CSV Output File :

Cordon Data File : QM18CD.DAT  
 Loaded Network : QM18NL.000 WAKATIPU MODEL 2018 AMP LIGHTS Y  
 6018 Links in network

Cordon Number : 3  
 Description : 4 SURROUNDING QUEENSTOWN (Inbound 1st)

NODE1	NODE2	FORWARD					BACKTOTAL					COUNT	VOLUME	CHANGE	%	
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%	GEH					
1747	3761	1036.	1124	88.	108.5	2.7	1041.	826	-215.	79.3	7.0	2077.	1950	-127.	93.9	SH6A (West of Yewlett Cres)
1930	1935	138.	152	14.	110.1	1.2	57.	66	9.	115.8	1.1	195.	218	23.	111.8	Edinburgh Dr (East of Belfast Tce)
1963	1971	43.	54	11.	125.6	1.6	25.	26	1.	104.0	0.2	69.	80	11.	115.9	Panorama Tce (West of Wakatipu Heights)
1829	1839	485.	403	-82.	83.1	3.9	337.	269	-68.	79.8	3.9	822.	672	-150.	81.8	Gorge Rd (South of Sawmill Rd)
2038	1998	396.	373	-23.	94.2	1.2	160.	120	-40.	75.0	3.4	556.	493	-63.	88.7	Fernhill Rd (East of Sainsbury Rd)
3111	2132	111.	75	-36.	67.6	3.7	93.	106	13.	114.0	1.3	204.	181	-23.	88.7	Glenorchy Qtown Rd (East of Moke Lake Rd)

Number of links = 6 Number of forward links = 6 Number of back links = 6

TOTALS	FORWARD	BACK	TOTALS
COUNT	2209.	1713.	3923.
VOLUME	2181.	1413.	3594.
CHANGE	-28.	-300.	-329.
%	99.	82.	92.
CORREL.			
COEFF.	0.992	0.999	0.998
%RMS	15.66	35.96	14.31
r^2	0.984	0.998	0.996
GEH	0.6	7.6	5.4
GEH <5	<7	<10	<12 >12
#	11	11	12 12 0
%	91.7	91.7	100.0 100.0 0.0

Cordon Number : 4  
 Description : 5 EAST OF QUEENSTOWN (twds qtown 1st)

NODE1	NODE2	FORWARD					BACKTOTAL					COUNT	VOLUME	CHANGE	%	
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%	GEH					
1002	2622	81.	67	-14.	82.7	1.6	36.	59	23.	163.9	3.3	117.	126	9.	107.7	Cadrona Valley Rd (North of Tuohys Gully Rd)
1836	1835	238.	205	-33.	86.1	2.2	163.	128	-35.	78.5	2.9	400.	333	-67.	83.2	SH6 (00600970 Gibbston-before Gibbston Back Rd)
3280	1820	623.	619	-4.	99.4	0.2	414.	334	-80.	80.7	4.1	1037.	953	-84.	91.9	SH6 (00690997 Btwn Southberg Ave & Bridge)

Number of links = 3 Number of forward links = 3 Number of back links = 3

TOTALS	FORWARD	BACK	TOTALS
COUNT	942.	613.	1554.
VOLUME	891.	521.	1412.
CHANGE	-51.	-92.	-142.
%	95.	85.	91.
CORREL.			
COEFF.	0.999	0.996	0.998
%RMS	8.12	31.25	14.72
r^2	0.998	0.991	0.996
GEH	1.7	3.9	3.7
GEH <5	<7	<10	<12 >12

# 6 6 6 6 0  
 % 100.0 100.0 100.0 100.0 0.0

Cordon Number : 5  
 Description : 6 NORTH OF CROMWEL L AND C (SB/EB 1st)

NODE1	NODE2	FORWARD					BACKTOTAL					COUNT	VOLUME	CHANGE	%	GEH
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%	GEH					
1002	2622	81.	67	-14.	82.7	1.6	36.	59	23.	163.9	3.3	117.	126	9.	107.7	Cadrona Valley Rd (North of Tuohys Gully Rd)
3057	3058	271.	229	-42.	84.5	2.7	177.	191	14.	107.9	1.0	448.	420	-28.	93.8	SH6 (00600939 Lowburn)
3100	3066	37.	39	2.	105.4	0.3	64.	37	-27.	57.8	3.8	101.	76	-25.	75.2	SH8 (00800278 Bendigo)

Number of links = 3 Number of forward links = 3 Number of back links = 3

TOTALS	FORWARD	BACK	TOTALS
COUNT	389.	277.	666.
VOLUME	335.	287.	622.
CHANGE	-54.	10.	-44.
%	86.	104.	93.

CORREL.

COEFF.	0.999	0.949	0.996
%RMS	24.17	29.20	12.29
r^2	0.998	0.900	0.991
GEH	2.8	0.6	1.7

GEH <5 <7 <10 <12 >12  
 # 6 6 6 6 0  
 % 100.0 100.0 100.0 100.0 0.0

Cordon Number : 6  
 Description : 7 WANAKA CORDON (Inbound 1st)

NODE1	NODE2	FORWARD					BACKTOTAL					COUNT	VOLUME	CHANGE	%	GEH
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%	GEH					
2622	1002	36.	59	23.	163.9	3.3	81.	67	-14.	82.7	1.6	117.	126	9.	107.7	Cadrona Valley Rd (North of Tuohys Gully Rd)
1668	2746	10.	12	2.	120.0	0.6	13.	9	-4.	69.2	1.2	23.	21	-2.	91.3	Mt Barker Rd (West of SH6)
1663	1664	57.	30	-27.	52.6	4.1	27.	15	-12.	55.6	2.6	83.	45	-38.	54.2	Ballantyne Road (West of SH6)
1601	1559	186.	247	61.	132.8	4.1	188.	176	-12.	93.6	0.9	374.	423	49.	113.1	SH6 (00600895 WANAKA - Telemetry Site 109)
1362	1375	157.	185	28.	117.8	2.1	85.	62	-23.	72.9	2.7	242.	247	5.	102.1	SH6 (00600884 Hawea Sth of dam)
1421	1422	5.	14	9.	280.0	2.9	16.	16	0.	100.0	0.0	21.	30	9.	142.9	Wanaka Mt Aspiring Rd (West of West Wanaka Rd)

Number of links = 6 Number of forward links = 6 Number of back links = 6

TOTALS	FORWARD	BACK	TOTALS
COUNT	451.	410.	860.
VOLUME	547.	345.	892.
CHANGE	96.	-65.	32.
%	121.	84.	104.

CORREL.

COEFF.	0.977	0.994	0.992
%RMS	45.50	20.99	19.82
r^2	0.955	0.987	0.983
GEH	4.3	3.3	1.1

GEH <5 <7 <10 <12 >12  
 # 12 12 12 12 0  
 % 100.0 100.0 100.0 100.0 0.0

Cordon Number : 7  
 Description : 8 NORTH OF WANAKA (SB 1st)

NODE1	NODE2	FORWARD					BACKTOTAL					COUNT	VOLUME	CHANGE	%	GEH
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%	GEH					
1362	1375	157.	185	28.	117.8	2.1	85.	62	-23.	72.9	2.7	242.	247	5.	102.1	SH6 (00600884 Hawea Sth of dam)
1580	1579	20.	11	-9.	55.0	2.3	11.	9	-2.	81.8	0.6	31.	20	-11.	64.5	Kane Rd (Anywhere North of SH8A)

Number of links = 2 Number of forward links = 2 Number of back links = 2

TOTALS	FORWARD	BACK	TOTALS
COUNT	177.	96.	273.
VOLUME	196.	71.	267.
CHANGE	19.	-25.	-6.
%	111.	74.	98.

CORREL.

COEFF.	1.000	1.000	1.000
%RMS	33.23	48.10	8.85
r^2	1.000	1.000	1.000
GEH	1.4	2.7	0.4

GEH <5 <7 <10 <12 >12  
 # 4 4 4 4 0  
 % 100.0 100.0 100.0 100.0 0.0

Cordon Number : 8  
 Description : 1 Frankton Cordon (Inbound 1st)

NODE1	NODE2	FORWARD					BACKTOTAL					COUNT	VOLUME	CHANGE	%	GEH
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%	GEH					
3736	3735	278.	324	46.	116.5	2.7	8.	1	-7.	12.5	3.3	286.	325	39.	113.6	Hardware Lane (South of SH6)
3731	3732	308.	272	-36.	88.3	2.1	195.	186	-9.	95.4	0.7	504.	458	-46.	90.9	EAR Spine (South of SH6)
3730	3737	164.	217	53.	132.3	3.8	87.	128	41.	147.1	4.0	251.	345	94.	137.5	Grants Rd (South of SH6)
1745	1760	70.	92	22.	131.4	2.4	62.	37	-25.	59.7	3.6	132.	129	-3.	97.7	Joe Oconnell Dr (South of SH6)

2680	1693	553.	482	-71.	87.2	3.1	365.	352	-13.	96.4	0.7	918.	834	-84.	90.8	Lucas Pl (East of SH6)
1815	1810	262.	202	-60.	77.1	3.9	192.	151	-41.	78.6	3.1	453.	353	-100.	77.9	Humphrey St (East of SH6)

Number of links = 6 Number of forward links = 6 Number of back links = 6

TOTALS	FORWARD	BACK	TOTALS
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COUNT	1635.	909.	2544.
VOLUME	1589.	855.	2444.
CHANGE	-46.	-54.	-100.
%	97.	94.	96.

CORREL.

COEFF.	0.953	0.977	0.971
%RMS	20.33	19.33	18.13
r^2	0.908	0.954	0.943
GEH	1.1	1.8	2.0

GEH	<5	<7	<10	<12	>12
#	12	12	12	12	0
%	100.0	100.0	100.0	100.0	0.0

Cordon Number : 9  
Description : 2 Frankton North SH6 (SB/EB 1st)

NODE1	NODE2	FORWARD					BACKTOTAL					COUNT	VOLUME	CHANGE	%	GEH	
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%	GEH						
4408	1745	30.	10	-20.	33.3	4.5	49.	14	-35.	28.6	6.2	79.	24	-55.	30.4	Hansen Rd (North of SH6)	
1733	3319	160.	159	-1.	99.4	0.1	63.	78	15.	123.8	1.8	223.	237	14.	106.3	Tucker Beach Rd (North of SH6)	
3343	1164	160.	134	-26.	83.8	2.1	107.	119	12.	111.2	1.1	267.	253	-14.	94.8	Lower Shotover Rd (North of Spence Rd)	

Number of links = 3 Number of forward links = 3 Number of back links = 3

TOTALS	FORWARD	BACK	TOTALS
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COUNT	350.	219.	569.
VOLUME	303.	211.	514.
CHANGE	-47.	-8.	-55.
%	87.	96.	90.

CORREL.

COEFF.	0.988	0.915	0.987
%RMS	19.89	38.67	21.79
r^2	0.975	0.837	0.974
GEH	2.6	0.5	2.4

GEH	<5	<7	<10	<12	>12
#	5	6	6	6	0
%	83.3	100.0	100.0	100.0	0.0

Cordon Number : 10  
Description : 3 Frankton South Frankton Rd and SH6 (SB

NODE1	NODE2	FORWARD					BACKTOTAL					COUNT	VOLUME	CHANGE	%	GEH	
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%	GEH						
1747	1754	99.	93	-6.	93.9	0.6	72.	122	50.	169.4	5.1	171.	215	44.	125.7	Yewlett Cres (South of SH6A)	
2251	3069	74.	113	39.	152.7	4.0	77.	70	-7.	90.9	0.8	151.	183	32.	121.2	McBride St (South of SH6A)	
2325	2679	754.	661	-93.	87.7	3.5	631.	751	120.	119.0	4.6	1385.	1412	27.	101.9	SH6 (South of Gray St)	
1745	1760	70.	92	22.	131.4	2.4	62.	37	-25.	59.7	3.6	132.	129	-3.	97.7	Joe Oconnell Dr (South of SH6)	
3730	3737	164.	217	53.	132.3	3.8	87.	128	41.	147.1	4.0	251.	345	94.	137.5	Grants Rd (South of SH6)	
3731	3732	308.	272	-36.	88.3	2.1	195.	186	-9.	95.4	0.7	504.	458	-46.	90.9	EAR Spine (South of SH6)	
3736	3735	278.	324	46.	116.5	2.7	8.	1	-7.	12.5	3.3	286.	325	39.	113.6	Hardware Lane (South of SH6)	
3744	3307	66.	77	11.	116.7	1.3	132.	301	169.	228.0	11.5	198.	378	180.	190.9	Stalker Rd (South of SH6)	
3347	3742	128.	169	41.	132.0	3.4	295.	415	120.	140.7	6.4	422.	584	162.	138.4	Howards Dr (South of SH6)	

Number of links = 9 Number of forward links = 9 Number of back links = 9

TOTALS	FORWARD	BACK	TOTALS
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COUNT	1941.	1559.	3500.
VOLUME	2018.	2011.	4029.
CHANGE	77.	452.	529.
%	104.	129.	115.

CORREL.

COEFF.	0.988	0.968	0.982
%RMS	22.43	50.96	24.87
r^2	0.976	0.938	0.965
GEH	1.7	10.7	8.6

GEH	<5	<7	<10	<12	>12
#	15	17	17	18	0
%	83.3	94.4	94.4	100.0	0.0

Cordon Number : 11  
Description : 0 At BP Rbt (SB/EB 1st)

NODE1	NODE2	FORWARD					BACKTOTAL					COUNT	VOLUME	CHANGE	%	GEH	
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%	GEH						
1747	1754	99.	93	-6.	93.9	0.6	72.	122	50.	169.4	5.1	171.	215	44.	125.7	Yewlett Cres (South of SH6A)	
2251	3069	74.	113	39.	152.7	4.0	77.	70	-7.	90.9	0.8	151.	183	32.	121.2	McBride St (South of SH6A)	
2325	2679	754.	661	-93.	87.7	3.5	631.	751	120.	119.0	4.6	1385.	1412	27.	101.9	SH6 (South of Gray St)	

Number of links = 3 Number of forward links = 3 Number of back links = 3

TOTALS	FORWARD	BACK	TOTALS
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COUNT	927.	780.	1707.
VOLUME	867.	943.	1810.

CHANGE -60. 163. 103.  
 % 94. 121. 106.  
 CORREL.  
 COEFF. 0.998 0.997 1.000  
 %RMS 23.12 35.41 7.55  
 r^2 0.996 0.994 1.000  
 GEH 2.0 5.6 2.5  
 GEH <5 <7 <10 <12 >12  
 # 5 6 6 6 0  
 % 83.3 100.0 100.0 100.0 0.0

Cordon Number : 12  
 Description : 9 OUTER QUEENSTOWN (Inbound 1st)

NODE1	NODE2	FORWARD					BACKTOTAL					COUNT	VOLUME	CHANGE	%	GEH	
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%	GEH						
1202	2558	244.	269	25.	110.2	1.6	211.	138	-73.	65.4	5.5	455.	407	-48.	89.5	1.6	Arthurs Pt Rd (North of Morning Star Tce)
3343	1164	160.	134	-26.	83.8	2.1	107.	119	12.	111.2	1.1	267.	253	-14.	94.8	2.1	Lower Shotover Rd (North of Spence Rd)
3347	3274	883.	900	17.	101.9	0.6	506.	472	-34.	93.3	1.5	1389.	1372	-17.	98.8	0.6	SH6 (East of Lower Shotover Road)
3906	2513	321.	355	34.	110.6	1.8	250.	198	-52.	79.2	3.5	571.	553	-18.	96.8	1.8	SH6 (00601000 Remarkables after ski field)
3111	2245	111.	124	13.	111.7	1.2	93.	82	-11.	88.2	1.2	204.	206	2.	101.0	1.2	Glenorchy Qtown Rd (East of Moke Lake Rd)

Number of links = 5 Number of forward links = 5 Number of back links = 5

TOTALS FORWARD BACK TOTALS  
 COUNT 1719. 1167. 2886.  
 VOLUME 1782. 1009. 2791.  
 CHANGE 63. -158. -95.  
 % 104. 86. 97.  
 CORREL.  
 COEFF. 0.998 0.980 0.999  
 %RMS 7.85 20.83 4.84  
 r^2 0.995 0.961 0.999  
 GEH 1.5 4.8 1.8  
 GEH <5 <7 <10 <12 >12  
 # 9 10 10 10 0  
 % 90.0 100.0 100.0 100.0 0.0

Cordon Number : 13  
 Description : 10 Frankton Spots (SB/EB 1st)

NODE1	NODE2	FORWARD					BACKTOTAL					COUNT	VOLUME	CHANGE	%	GEH	
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%	GEH						
1693	2694	156.	157	1.	100.6	0.1	172.	169	-3.	98.3	0.2	328.	326	-2.	99.4	0.1	Airport (East of Lucas Pl)
2970	3085	158.	147	-11.	93.0	0.9	60.	68	8.	113.3	1.0	219.	215	-4.	98.2	0.9	Ferry Hill Dr (West of Tucker Beach Rd)
3268	3275	221.	307	86.	138.9	5.3	130.	178	48.	136.9	3.9	351.	485	134.	138.2	5.3	Peninsula Rd (West of SH6)
1921	2274	262.	200	-62.	76.3	4.1	307.	356	49.	116.0	2.7	568.	556	-12.	97.9	4.1	SH6 (00600999 Sth of Peninsula Rd)

Number of links = 4 Number of forward links = 4 Number of back links = 4

TOTALS FORWARD BACK TOTALS  
 COUNT 797. 669. 1466.  
 VOLUME 811. 771. 1582.  
 CHANGE 14. 102. 116.  
 % 102. 115. 108.  
 CORREL.  
 COEFF. 0.563 0.981 0.892  
 %RMS 30.89 23.86 21.21  
 r^2 0.316 0.962 0.796  
 GEH 0.5 3.8 3.0  
 GEH <5 <7 <10 <12 >12  
 # 7 8 8 8 0  
 % 87.5 100.0 100.0 100.0 0.0

Cordon Number : 14  
 Description : 0 Outer Spots (Inbound 1st)

NODE1	NODE2	FORWARD					BACKTOTAL					COUNT	VOLUME	CHANGE	%	GEH	
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%	GEH						
2140	3526	94.	142	48.	151.1	4.4	112.	83	-29.	74.1	2.9	206.	225	19.	109.2	4.4	00601005 (Between Jacks Point and Lakeside)
1309	1310	11.	9	-2.	81.8	0.6	21.	12	-9.	57.1	2.2	31.	21	-10.	67.7	0.6	00600853 Lake Wanaka Camp Creek Bridge
3064	3060	27.	40	13.	148.1	2.2	65.	64	-1.	98.5	0.1	92.	104	12.	113.0	2.2	00800263 TARRAS - Telemetry Site 110
3068	3067	217.	283	66.	130.4	4.2	188.	181	-7.	96.3	0.5	406.	464	58.	114.3	4.2	00800313 Cromwell Gorge

Number of links = 4 Number of forward links = 4 Number of back links = 4

TOTALS FORWARD BACK TOTALS  
 COUNT 349. 386. 735.  
 VOLUME 474. 340. 814.  
 CHANGE 125. -46. 79.  
 % 136. 88. 111.  
 CORREL.  
 COEFF. 0.996 0.985 1.000  
 %RMS 54.70 18.65 19.79  
 r^2 0.993 0.971 0.999  
 GEH 6.2 2.4 2.8  
 GEH <5 <7 <10 <12 >12  
 # 8 8 8 8 0  
 % 100.0 100.0 100.0 100.0 0.0

Gordon Number : 15  
 Description : 0 ALL COUNTS

		FORWARD					BACKTOTAL									
NODE1	NODE2	COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%	GEH
1747	3761	1036.	1124	88.	108.5	2.7	1041.	826	-215.	79.3	7.0	2077.	1950	-127.	93.9	SH6A (West of Yewlett Cres)
1930	1935	138.	152	14.	110.1	1.2	57.	66	9.	115.8	1.1	195.	218	23.	111.8	Edinburgh Dr (East of Belfast Tce)
1963	1971	43.	54	11.	125.6	1.6	25.	26	1.	104.0	0.2	69.	80	11.	115.9	Panorama Tce (West of Wakatipu Heights)
1829	1839	485.	403	-82.	83.1	3.9	337.	269	-68.	79.8	3.9	822.	672	-150.	81.8	Gorge Rd (South of Sawmill Rd)
2038	1998	396.	373	-23.	94.2	1.2	160.	120	-40.	75.0	3.4	556.	493	-63.	88.7	Fernhill Rd (East of Sainsbury Rd)
3111	2132	111.	75	-36.	67.6	3.7	93.	106	13.	114.0	1.3	204.	181	-23.	88.7	Glenorchy Qtown Rd (East of Moke Lake Rd)
1002	2622	81.	67	-14.	82.7	1.6	36.	59	23.	163.9	3.3	117.	126	9.	107.7	Cadrona Valley Rd (North of Tuohys Gully Rd)
1836	1835	238.	205	-33.	86.1	2.2	163.	128	-35.	78.5	2.9	400.	333	-67.	83.2	SH6 (00600970 Gibbstn-before Gibbstn Back Rd)
3280	1820	623.	619	-4.	99.4	0.2	414.	334	-80.	80.7	4.1	1037.	953	-84.	91.9	SH6 (00690997 Btwn Southberg Ave & Bridge)
3057	3058	271.	229	-42.	84.5	2.7	177.	191	14.	107.9	1.0	448.	420	-28.	93.8	SH6 (00600939 Lowburn)
3100	3066	37.	39	2.	105.4	0.3	64.	37	-27.	57.8	3.8	101.	76	-25.	75.2	SH8 (00800278 Bendigo)
2622	1002	36.	59	23.	163.9	3.3	81.	67	-14.	82.7	1.6	117.	126	9.	107.7	Cadrona Valley Rd (North of Tuohys Gully Rd)
1668	2746	10.	12	2.	120.0	0.6	13.	9	-4.	69.2	1.2	23.	21	-2.	91.3	Mt Barker Rd (West of SH6)
1663	1664	57.	30	-27.	52.6	4.1	27.	15	-12.	55.6	2.6	83.	45	-38.	54.2	Ballantyne Road (West of SH6)
1601	1559	186.	247	61.	132.8	4.1	188.	176	-12.	93.6	0.9	374.	423	49.	113.1	SH6 (00600895 WANAKA - Telemetry Site 109)
1362	1375	157.	185	28.	117.8	2.1	85.	62	-23.	72.9	2.7	242.	247	5.	102.1	SH6 (00600884 Hawea Sth of dam)
1421	1422	5.	14	9.	280.0	2.9	16.	16	0.	100.0	0.0	21.	30	9.	142.9	Wanaka Mt Aspiring Rd (West of West Wanaka Rd )
1362	1375	157.	185	28.	117.8	2.1	85.	62	-23.	72.9	2.7	242.	247	5.	102.1	SH6 (00600884 Hawea Sth of dam)
1580	1579	20.	11	-9.	55.0	2.3	11.	9	-2.	81.8	0.6	31.	20	-11.	64.5	Kane Rd (Anywhere North of SH8A)
3736	3735	278.	324	46.	116.5	2.7	8.	1	-7.	12.5	3.3	286.	325	39.	113.6	Hardware Lane (South of SH6)
3731	3732	308.	272	-36.	88.3	2.1	195.	186	-9.	95.4	0.7	504.	458	-46.	90.9	EAR Spine (South of SH6)
3730	3737	164.	217	53.	132.3	3.8	87.	128	41.	147.1	4.0	251.	345	94.	137.5	Grants Rd (South of SH6)
1745	1760	70.	92	22.	131.4	2.4	62.	37	-25.	59.7	3.6	132.	129	-3.	97.7	Joe Oconnell Dr (South of SH6)
2680	1693	553.	482	-71.	87.2	3.1	365.	352	-13.	96.4	0.7	918.	834	-84.	90.8	Lucas Pl (East of SH6)
1815	1810	262.	202	-60.	77.1	3.9	192.	151	-41.	78.6	3.1	453.	353	-100.	77.9	Humphrey St (East of SH6)
4408	1745	30.	10	-20.	33.3	4.5	49.	14	-35.	28.6	6.2	79.	24	-55.	30.4	Hansen Rd (North of SH6)
1733	3319	160.	159	-1.	99.4	0.1	63.	78	15.	123.8	1.8	223.	237	14.	106.3	Tucker Beach Rd (North of SH6)
3343	1164	160.	134	-26.	83.8	2.1	107.	119	12.	111.2	1.1	267.	253	-14.	94.8	Lower Shotover Rd (North of Spence Rd)
1747	1754	99.	93	-6.	93.9	0.6	72.	122	50.	169.4	5.1	171.	215	44.	125.7	Yewlett Cres (South of SH6A)
2251	3069	74.	113	39.	152.7	4.0	77.	70	-7.	90.9	0.8	151.	183	32.	121.2	McBride St (South of SH6A)
2325	2679	754.	661	-93.	87.7	3.5	631.	751	120.	119.0	4.6	1385.	1412	27.	101.9	SH6 (South of Gray St)
3744	3307	66.	77	11.	116.7	1.3	132.	301	169.	228.0	11.5	198.	378	180.	190.9	Stalker Dr (South of SH6)
3347	3742	128.	169	41.	132.0	3.4	295.	415	120.	140.7	6.4	422.	584	162.	138.4	Howards Dr (South of SH6)
1202	2558	244.	269	25.	110.2	1.6	211.	138	-73.	65.4	5.5	455.	407	-48.	89.5	Arthurs Pt Rd (North of Morning Star Tce)
3343	1164	160.	134	-26.	83.8	2.1	107.	119	12.	111.2	1.1	267.	253	-14.	94.8	Lower Shotover Rd (North of Spence Rd)
3347	3274	883.	900	17.	101.9	0.6	506.	472	-34.	93.3	1.5	1389.	1372	-17.	98.8	SH6 (East of Lower Shotover Road)
3906	2513	321.	355	34.	110.6	1.8	250.	198	-52.	79.2	3.5	571.	553	-18.	96.8	SH6 (00601000 Remarkables after ski field)
3111	2245	111.	124	13.	111.7	1.2	93.	82	-11.	88.2	1.2	204.	206	2.	101.0	Glenorchy Qtown Rd (East of Moke Lake Rd)
1693	2694	156.	157	1.	100.6	0.1	172.	169	-3.	98.3	0.2	328.	326	-2.	99.4	Airport (East of Lucas Pl)
2970	3085	158.	147	-11.	93.0	0.9	60.	68	8.	113.3	1.0	219.	215	-4.	98.2	Ferry Hill Dr (West of Tucker Beach Rd)
3268	3275	221.	307	86.	138.9	5.3	130.	178	48.	136.9	3.9	351.	485	134.	138.2	Peninsula Rd (West of SH6)
1921	2274	262.	200	-62.	76.3	4.1	307.	356	49.	116.0	2.7	568.	556	-12.	97.9	SH6 (00600999 Sth of Peninsula Rd)
2140	3526	94.	142	48.	151.1	4.4	112.	83	-29.	74.1	2.9	206.	225	19.	109.2	00601005 (Between Jacks Point and Lakeside)
1309	1310	11.	9	-2.	81.8	0.6	21.	12	-9.	57.1	2.2	31.	21	-10.	67.7	00600853 Lake Wanaka Camp Creek Bridge
3064	3060	27.	40	13.	148.1	2.2	65.	64	-1.	98.5	0.1	92.	104	12.	113.0	00800263 TARRAS - Telemetry Site 110
3068	3067	217.	283	66.	130.4	4.2	188.	181	-7.	96.3	0.5	406.	464	58.	114.3	00800313 Cromwell Gorge
3761	1747	1041.	826	-215.	79.3	7.0	1036.	1124	88.	108.5	2.7	2077.	1950	-127.	93.9	SH6A (West of Yewlett Cres)
1935	1930	57.	66	9.	115.8	1.1	138.	152	14.	110.1	1.2	195.	218	23.	111.8	Edinburgh Dr (East of Belfast Tce)
1971	1963	25.	26	1.	104.0	0.2	43.	54	11.	125.6	1.6	69.	80	11.	115.9	Panorama Tce (West of Wakatipu Heights)
1839	1829	337.	269	-68.	79.8	3.9	485.	403	-82.	83.1	3.9	822.	672	-150.	81.8	Gorge Rd (South of Sawmill Rd)
1998	2038	160.	120	-40.	75.0	3.4	396.	373	-23.	94.2	1.2	556.	493	-63.	88.7	Fernhill Rd (East of Sainsbury Rd)
2132	3111	93.	106	13.	114.0	1.3	111.	75	-36.	67.6	3.7	204.	181	-23.	88.7	Glenorchy Qtown Rd (East of Moke Lake Rd)
2622	1002	36.	59	23.	163.9	3.3	81.	67	-14.	82.7	1.6	117.	126	9.	107.7	Cadrona Valley Rd (North of Tuohys Gully Rd)
1835	1836	163.	128	-35.	78.5	2.9	238.	205	-33.	86.1	2.2	400.	333	-67.	83.2	SH6 (00600970 Gibbstn-before Gibbstn Back Rd)
1820	3280	414.	334	-80.	80.7	4.1	623.	619	-4.	99.4	0.2	1037.	953	-84.	91.9	SH6 (00690997 Btwn Southberg Ave & Bridge)
3058	3057	177.	191	14.	107.9	1.0	271.	229	-42.	84.5	2.7	448.	420	-28.	93.8	SH6 (00600939 Lowburn)
3066	3100	64.	37	-27.	57.8	3.8	37.	39	2.	105.4	0.3	101.	76	-25.	75.2	SH8 (00800278 Bendigo)
1002	2622	81.	67	-14.	82.7	1.6	36.	59	23.	163.9	3.3	117.	126	9.	107.7	Cadrona Valley Rd (North of Tuohys Gully Rd)
2746	1668	13.	9	-4.	69.2	1.2	10.	12	2.	120.0	0.6	23.	21	-2.	91.3	Mt Barker Rd (West of SH6)
1664	1663	27.	15	-12.	55.6	2.6	57.	30	-27.	52.6	4.1	83.	45	-38.	54.2	Ballantyne Road (West of SH6)
1559	1601	188.	176	-12.	93.6	0.9	186.	247	61.	132.8	4.1	374.	423	49.	113.1	SH6 (00600895 WANAKA - Telemetry Site 109)
1375	1362	85.	62	-23.	72.9	2.7	157.	185	28.	117.8	2.1	242.	247	5.	102.1	SH6 (00600884 Hawea Sth of dam)
1422	1421	16.	16	0.	100.0	0.0	5.	14	9.	280.0	2.9	21.	30	9.	142.9	Wanaka Mt Aspiring Rd (West of West Wanaka Rd )
1375	1362	85.	62	-23.	72.9	2.7	157.	185	28.	117.8	2.1	242.	247	5.	102.1	SH6 (00600884 Hawea Sth of dam)
1579	1580	11.	9	-2.	81.8	0.6	20.	11	-9.	55.0	2.3	31.	20	-11.	64.5	Kane Rd (Anywhere North of SH8A)
3735	3736	8.	1	-7.	12.5	3.3	278.	324	46.	116.5	2.7	286.	325	39.	113.6	Hardware Lane (South of SH6)
3732	3731	195.	186	-9.	95.4	0.7	308.	272	-36.	88.3	2.1	504.	458	-46.	90.9	EAR Spine (South of SH6)
3737	3730	87.	128	41.	147.1	4.0	164.	217	53.	132.3	3.8	251.	345	94.	137.5	Grants Rd (South of SH6)
1760	1745	62.	37	-25.	59.7	3.6	70.	92	22.	131.4	2.4	132.	129	-3.	97.7	Joe Oconnell Dr (South of SH6)
1693	2680	365.	352	-13.	96.4	0.7	553.	482	-71.	87.2	3.1	918.	834	-84.	90.8	Lucas Pl (East of SH6)
1810	1815	192.	151	-41.	78.6	3.1	262.	202	-60.	77.1	3.9	453.	353	-100.	77.9	Humphrey St (East of SH6)
1745	4408	49.	14	-35.	28.6	6.2	30.	10	-20.	33.3	4.5	79.	24	-55.	30.4	Hansen Rd (North of SH6)
3319	1733	63.	78	15.	123.8	1.8	160.	159	-1.	99.4	0.1	223.	237	14.	106.3	Tucker Beach Rd (North of SH6)
1164	3343	107.	119	12.	111.2	1.1	160.	134	-26.	83.8	2.1	267.	253	-14.	94.8	Lower Shotover Rd (North of Spence Rd)
1754	1747	72.	122	50.	169.4	5.1	99.	93	-6.	93.9	0.6	171.	215	44.	125.7	Yewlett Cres (South of SH6A)
3069	2251	77.	70	-7.	90.9	0.8	74.	113	39.	152.7	4.0	151.	183	32.	121.2	McBride St (South of SH6A)
2679	2325	631.	751	120.	119.0	4.6	754.	661	-93.	87.7	3.5	1385.	1412	27.	101.9	SH6 (South of Gray St)
3307	3744	132.	301	169.	228.0	11.5	66.	77	11.	116.7	1.3	198.	378	180.	190.9	Stalker Dr (South of SH6)
3742	3347	295.	415	120.	140.7	6.4	128.	169	41.	132.0	3.4	422.	584	162.	138.4	Howards Dr (South of SH6)
2558	1202	211.	138	-73.	65.4	5.5	244.	269	25.	110.2	1.6	455.	407	-48.	89.5	Arthurs Pt Rd (North of Morning Star Tce)
1164	3343	107.	119	12.	111.2	1.1	160.	134	-26.							

Number of links = 92 Number of forward links = 92 Number of back links = 92

TOTALS	FORWARD	BACK	TOTALS		
COUNT	17688.	17688.	35372.		
VOLUME	17578.	17578.	35156.		
CHANGE	-110.	-110.	-216.		
%	99.	99.	99.		
CORREL.					
COEFF.	0.972	0.972	0.989		
%RMS	25.59	25.59	16.43		
r^2	0.945	0.945	0.977		
GEH	0.8	0.8	1.2		
GEH <5 <7 <10 <12 >12					
#	170	180	182	184	0
%	92.4	97.8	98.9	100.0	0.0

CORDON terminated successfully

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+-----+
| TRACKS TRACKS TRACKS TRACKS TRACKS TRACKS TR |
| TRACKS +-----+ TRACKS |
| S TRACKS | | S TRACKS |
| KS TRACK | Program : CORDON | KS TRACK |
| CKS TRAC | Version : V7.08 | CKS TRAC |
| ACKS TRA | | ACKS TRA |
| RACKS TR | Date run : 23-AUG-22 | RACKS TR |
| TRACKS T | Time run : 16:54:01 | TRACKS T |
| TRACKS | Platform : Win 95/NT | TRACKS |
| S TRACKS+-----+S TRACKS |
| KS TRACKS TRACKS TRACKS TRACKS TRACKS TRACKS |
+-----+
| TRACKS Licenced to |
| |
| at : Abley Christchurch |
+-----+
Build Date : 11/12/12 07:32
Parameter version : V5.20

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Network Period Factor : 1.000

Cordon Period Factor : 1.000

GEH Period Factor : 1.000

CSV Output File :

Cordon Data File : QI18CD.DAT  
 Loaded Network : QI18NL.000 WAKATIPU MODEL 2018 AMP LIGHTS Y  
 6018 Links in network

Cordon Number : 3  
 Description : 4 SURROUNDING QUEENSTOWN (Inbound 1st)

NODE1	NODE2	FORWARD					BACKTOTAL					COUNT	VOLUME	CHANGE	%	
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%	GEH					
1747	3761	975.	1048	73.	107.5	2.3	937.	1071	134.	114.3	4.2	1912.	2119	207.	110.8	SH6A (West of Yewlett Cres)
1930	1935	75.	106	31.	141.3	3.3	54.	88	34.	163.0	4.0	129.	194	65.	150.4	Edinburgh Dr (East of Belfast Tce)
1963	1971	30.	40	10.	133.3	1.7	30.	48	18.	160.0	2.9	59.	88	29.	149.2	Panorama Tce (West of Wakatipu Heights)
1829	1839	363.	358	-5.	98.6	0.3	320.	331	11.	103.4	0.6	683.	689	6.	100.9	Gorge Rd (South of Sawmill Rd)
2038	1998	172.	203	31.	118.0	2.3	164.	198	34.	120.7	2.5	336.	401	65.	119.3	Fernhill Rd (East of Sainsbury Rd)
3111	2132	125.	79	-46.	63.2	4.6	123.	85	-38.	69.1	3.7	248.	164	-84.	66.1	Glenorchy Qtown Rd (East of Moke Lake Rd)

Number of links = 6 Number of forward links = 6 Number of back links = 6

TOTALS	FORWARD	BACK	TOTALS		
COUNT	1740.	1628.	3367.		
VOLUME	1834.	1821.	3655.		
CHANGE	94.	193.	288.		
%	105.	112.	109.		
CORREL.					
COEFF.	0.997	0.997	0.997		
%RMS	15.02	24.53	19.40		
r^2	0.993	0.993	0.993		
GEH	2.2	4.6	4.9		
GEH <5 <7 <10 <12 >12					
#	12	12	12	12	0
%	100.0	100.0	100.0	100.0	0.0



Cordon Number : 4  
 Description : 5 EAST OF QUEENSTOWN (twds qtown 1st)

NODE1	NODE2	FORWARD				BACKTOTAL				COUNT	VOLUME	CHANGE	%	GEH		
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE							%
1002	2622	59.	81	22.	137.3	2.6	54.	77	23.	142.6	2.8	113.	158	45.	139.8	Cadrona Valley Rd (North of Tuohys Gully Rd)
1836	1835	193.	197	4.	102.1	0.3	222.	246	24.	110.8	1.6	415.	443	28.	106.7	SH6 (00600970 Gibbston-before Gibbston Back Rd)
3280	1820	498.	469	-29.	94.2	1.3	425.	420	-5.	98.8	0.2	924.	889	-35.	96.2	SH6 (00600997 Btwn Southberg Ave & Bridge)

Number of links = 3 Number of forward links = 3 Number of back links = 3

TOTALS	FORWARD	BACK	TOTALS
COUNT	750.	701.	1452.
VOLUME	747.	743.	1490.
CHANGE	-3.	42.	38.
%	100.	106.	103.
CORREL.			
COEFF.	1.000	0.999	1.000
%RMS	10.36	10.17	9.28
r^2	1.000	0.998	1.000
GEH	0.1	1.6	1.0
GEH <5 <7 <10 <12 >12			
#	6	6	6
%	100.0	100.0	100.0

Cordon Number : 5  
 Description : 6 NORTH OF CROMWEL L AND C (SB/EB 1st)

NODE1	NODE2	FORWARD				BACKTOTAL				COUNT	VOLUME	CHANGE	%	GEH		
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE							%
1002	2622	59.	81	22.	137.3	2.6	54.	77	23.	142.6	2.8	113.	158	45.	139.8	Cadrona Valley Rd (North of Tuohys Gully Rd)
3057	3058	207.	132	-75.	63.8	5.8	205.	135	-70.	65.9	5.4	412.	267	-145.	64.8	SH6 (00600939 Lowburn)
3100	3066	95.	82	-13.	86.3	1.4	103.	87	-16.	84.5	1.6	198.	169	-29.	85.4	SH8 (00800278 Bendigo)

Number of links = 3 Number of forward links = 3 Number of back links = 3

TOTALS	FORWARD	BACK	TOTALS
COUNT	361.	362.	723.
VOLUME	295.	299.	594.
CHANGE	-66.	-63.	-129.
%	82.	83.	82.
CORREL.			
COEFF.	0.976	0.987	0.982
%RMS	46.56	44.18	45.35
r^2	0.953	0.974	0.965
GEH	3.6	3.5	5.0
GEH <5 <7 <10 <12 >12			
#	4	6	6
%	66.7	100.0	100.0

Cordon Number : 6  
 Description : 7 WANAKA CORDON (Inbound 1st)

NODE1	NODE2	FORWARD				BACKTOTAL				COUNT	VOLUME	CHANGE	%	GEH		
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE							%
2622	1002	54.	77	23.	142.6	2.8	59.	81	22.	137.3	2.6	113.	158	45.	139.8	Cadrona Valley Rd (North of Tuohys Gully Rd)
1668	2746	9.	8	-1.	88.9	0.3	10.	8	-2.	80.0	0.7	19.	16	-3.	84.2	Mt Barker Rd (West of SH6)
1663	1664	38.	22	-16.	57.9	2.9	21.	20	-1.	95.2	0.2	60.	42	-18.	70.0	Ballantyne Road (West of SH6)
1601	1559	218.	193	-25.	88.5	1.7	215.	182	-33.	84.7	2.3	432.	375	-57.	86.8	SH6 (00600895 WANAKA - Telemetry Site 109)
1362	1375	135.	122	-13.	90.4	1.1	152.	114	-38.	75.0	3.3	287.	236	-51.	82.2	SH6 (00600884 Hawea Sth of dam)
1421	1422	20.	11	-9.	55.0	2.3	21.	11	-10.	52.4	2.5	42.	22	-20.	52.4	Wanaka Mt Aspiring Rd (West of West Wanaka Rd)

Number of links = 6 Number of forward links = 6 Number of back links = 6

TOTALS	FORWARD	BACK	TOTALS
COUNT	474.	478.	953.
VOLUME	433.	416.	849.
CHANGE	-41.	-62.	-104.
%	91.	87.	89.
CORREL.			
COEFF.	0.982	0.976	0.981
%RMS	23.07	31.37	26.12
r^2	0.963	0.953	0.962
GEH	1.9	2.9	3.5
GEH <5 <7 <10 <12 >12			
#	12	12	12
%	100.0	100.0	100.0

Cordon Number : 7  
 Description : 8 NORTH OF WANAKA (SB 1st)

NODE1	NODE2	FORWARD				BACKTOTAL				COUNT	VOLUME	CHANGE	%	GEH		
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE							%
1362	1375	135.	122	-13.	90.4	1.1	152.	114	-38.	75.0	3.3	287.	236	-51.	82.2	SH6 (00600884 Hawea Sth of dam)
1580	1579	11.	8	-3.	72.7	1.0	13.	8	-5.	61.5	1.5	24.	16	-8.	66.7	Kane Rd (Anywhere North of SH8A)

Number of links = 2 Number of forward links = 2 Number of back links = 2

TOTALS	FORWARD	BACK	TOTALS
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COUNT	146.	165.	311.
VOLUME	130.	122.	252.
CHANGE	-16.	-43.	-59.
%	89.	74.	81.
CORREL.			
COEFF.	1.000	1.000	1.000
%RMS	18.28	46.46	33.20
r^2	1.000	1.000	1.000
GEH	1.4	3.6	3.5

GEH	<5	<7	<10	<12	>12
#	4	4	4	4	0
%	100.0	100.0	100.0	100.0	0.0

Cordon Number : 8  
Description : 1 Frankton Cordon (Inbound 1st)

NODE1	NODE2	FORWARD					BACKTOTAL					COUNT	VOLUME	CHANGE	%	
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%	GEH					
3736	3735	148.	211	63.	142.6	4.7	12.	3	-9.	25.0	3.3	160.	214	54.	133.8	Hardware Lane (South of SH6)
3731	3732	188.	238	50.	126.6	3.4	336.	446	110.	132.7	5.6	524.	684	160.	130.5	EAR Spine (South of SH6)
3730	3737	301.	314	13.	104.3	0.7	241.	310	69.	128.6	4.2	542.	624	82.	115.1	Grants Rd (South of SH6)
1745	1760	83.	88	5.	106.0	0.5	88.	86	-2.	97.7	0.2	171.	174	3.	101.8	Joe Oconnell Dr (South of SH6)
2680	1693	574.	505	-69.	88.0	3.0	640.	497	-143.	77.7	6.0	1213.	1002	-211.	82.6	Lucas Pl (East of SH6)
1815	1810	202.	152	-50.	75.2	3.8	200.	144	-56.	72.0	4.3	401.	296	-105.	73.8	Humphrey St (East of SH6)

Number of links = 6 Number of forward links = 6 Number of back links = 6

TOTALS	FORWARD	BACK	TOTALS
COUNT	1496.	1517.	3011.
VOLUME	1508.	1486.	2994.
CHANGE	12.	-31.	-17.
%	101.	98.	99.
CORREL.			
COEFF.	0.961	0.914	0.942
%RMS	21.16	35.61	26.85
r^2	0.924	0.835	0.888
GEH	0.3	0.8	0.3

GEH	<5	<7	<10	<12	>12
#	10	12	12	12	0
%	83.3	100.0	100.0	100.0	0.0

Cordon Number : 9  
Description : 2 Frankton North SH6 (SB/EB 1st)

NODE1	NODE2	FORWARD					BACKTOTAL					COUNT	VOLUME	CHANGE	%	
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%	GEH					
4408	1745	34.	11	-23.	32.4	4.8	32.	11	-21.	34.4	4.5	66.	22	-44.	33.3	Hansen Rd (North of SH6)
1733	3319	88.	89	1.	101.1	0.1	99.	87	-12.	87.9	1.2	187.	176	-11.	94.1	Tucker Beach Rd (North of SH6)
3343	1164	89.	102	13.	114.6	1.3	97.	101	4.	104.1	0.4	186.	203	17.	109.1	Lower Shotover Rd (North of Spence Rd)

Number of links = 3 Number of forward links = 3 Number of back links = 3

TOTALS	FORWARD	BACK	TOTALS
COUNT	211.	228.	439.
VOLUME	202.	199.	401.
CHANGE	-9.	-29.	-38.
%	96.	87.	91.
CORREL.			
COEFF.	0.993	0.985	0.989
%RMS	26.58	22.81	23.40
r^2	0.986	0.971	0.979
GEH	0.6	2.0	1.9

GEH	<5	<7	<10	<12	>12
#	6	6	6	6	0
%	100.0	100.0	100.0	100.0	0.0

Cordon Number : 10  
Description : 3 Frankton South Frankton Rd and SH6 (SB

NODE1	NODE2	FORWARD					BACKTOTAL					COUNT	VOLUME	CHANGE	%	
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%	GEH					
1747	1754	61.	101	40.	165.6	4.4	56.	95	39.	169.6	4.5	117.	196	79.	167.5	Yewlett Cres (South of SH6A)
2251	3069	156.	150	-6.	96.2	0.5	89.	63	-26.	70.8	3.0	245.	213	-32.	86.9	McBride St (South of SH6A)
2325	2679	723.	683	-40.	94.5	1.5	771.	779	8.	101.0	0.3	1495.	1462	-33.	97.8	SH6 (South of Gray St)
1745	1760	83.	88	5.	106.0	0.5	88.	86	-2.	97.7	0.2	171.	174	3.	101.8	Joe Oconnell Dr (South of SH6)
3730	3737	301.	314	13.	104.3	0.7	241.	310	69.	128.6	4.2	542.	624	82.	115.1	Grants Rd (South of SH6)
3731	3732	188.	238	50.	126.6	3.4	336.	446	110.	132.7	5.6	524.	684	160.	130.5	EAR Spine (South of SH6)
3736	3735	148.	211	63.	142.6	4.7	12.	3	-9.	25.0	3.3	160.	214	54.	133.8	Hardware Lane (South of SH6)
3744	3307	95.	127	32.	133.7	3.0	94.	131	37.	139.4	3.5	189.	258	69.	136.5	Stalker Rd (South of SH6)
3347	3742	164.	235	71.	143.3	5.0	159.	238	79.	149.7	5.6	323.	473	150.	146.4	Howards Dr (South of SH6)

Number of links = 9 Number of forward links = 9 Number of back links = 9

TOTALS	FORWARD	BACK	TOTALS
COUNT	1919.	1846.	3766.
VOLUME	2147.	2151.	4298.
CHANGE	228.	305.	532.
%	112.	117.	114.
CORREL.			

COEFF. 0.989 0.983 0.987  
 %RMS 20.95 28.23 22.49  
 r^2 0.978 0.967 0.974  
 GEH 5.1 6.8 8.4

GEH <5 <7 <10 <12 >12  
 # 15 18 18 18 0  
 % 83.3 100.0 100.0 100.0 0.0

Cordon Number : 11  
 Description : 0 At BP Rbt (SB/EB 1st)

NODE1	NODE2	FORWARD				BACKTOTAL				COUNT	VOLUME	CHANGE	%	GEH		
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE							%
1747	1754	61.	101	40.	165.6	4.4	56.	95	39.	169.6	4.5	117.	196	79.	167.5	Yewlett Cres (South of SH6A)
2251	3069	156.	150	-6.	96.2	0.5	89.	63	-26.	70.8	3.0	245.	213	-32.	86.9	McBride St (South of SH6A)
2325	2679	723.	683	-40.	94.5	1.5	771.	779	8.	101.0	0.3	1495.	1462	-33.	97.8	SH6 (South of Gray St)

Number of links = 3 Number of forward links = 3 Number of back links = 3

TOTALS	FORWARD	BACK	TOTALS
COUNT	940.	916.	1857.
VOLUME	934.	937.	1871.
CHANGE	-6.	21.	14.
%	99.	102.	101.

CORREL.  
 COEFF. 0.998 0.997 0.997  
 %RMS 12.84 11.01 10.44  
 r^2 0.997 0.994 0.995  
 GEH 0.2 0.7 0.3

GEH <5 <7 <10 <12 >12  
 # 6 6 6 6 0  
 % 100.0 100.0 100.0 100.0 0.0

Cordon Number : 12  
 Description : 9 OUTER QUEENSTOWN (Inbound 1st)

NODE1	NODE2	FORWARD				BACKTOTAL				COUNT	VOLUME	CHANGE	%	GEH		
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE							%
1202	2558	205.	185	-20.	90.2	1.4	205.	174	-31.	84.9	2.3	410.	359	-51.	87.6	Arthurs Pt Rd (North of Morning Star Tce)
3343	1164	89.	102	13.	114.6	1.3	97.	101	4.	104.1	0.4	186.	203	17.	109.1	Lower Shotover Rd (North of Spence Rd)
3347	3274	627.	671	44.	107.0	1.7	652.	717	65.	110.0	2.5	1279.	1388	109.	108.5	SH6 (East of Lower Shotover Road)
3906	2513	287.	260	-27.	90.6	1.6	259.	215	-44.	83.0	2.9	547.	475	-72.	86.8	SH6 (00601000 Remarkables after ski field)
3111	2245	125.	93	-32.	74.4	3.1	123.	87	-36.	70.7	3.5	248.	180	-68.	72.6	Glenorchy Qtown Rd (East of Moke Lake Rd)

Number of links = 5 Number of forward links = 5 Number of back links = 5

TOTALS	FORWARD	BACK	TOTALS
COUNT	1333.	1336.	2670.
VOLUME	1311.	1294.	2605.
CHANGE	-22.	-42.	-65.
%	98.	97.	98.

CORREL.  
 COEFF. 0.995 0.994 0.995  
 %RMS 12.24 17.19 14.68  
 r^2 0.990 0.989 0.989  
 GEH 0.6 1.2 1.3

GEH <5 <7 <10 <12 >12  
 # 10 10 10 10 0  
 % 100.0 100.0 100.0 100.0 0.0

Cordon Number : 13  
 Description : 10 Frankton Spots (SB/EB 1st)

NODE1	NODE2	FORWARD				BACKTOTAL				COUNT	VOLUME	CHANGE	%	GEH		
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE							%
1693	2694	212.	206	-6.	97.2	0.4	230.	206	-24.	89.6	1.6	442.	412	-30.	93.2	Airport (East of Lucas Pl)
2970	3085	73.	78	5.	106.8	0.6	84.	77	-7.	91.7	0.8	157.	155	-2.	98.7	Ferry Hill Dr (West of Tucker Beach Rd)
3268	3275	144.	248	104.	172.2	7.4	133.	244	111.	183.5	8.1	277.	492	215.	177.6	Peninsula Rd (West of SH6)
1921	2274	271.	216	-55.	79.7	3.5	313.	261	-52.	83.4	3.1	584.	477	-107.	81.7	SH6 (00600999 Sth of Peninsula Rd)

Number of links = 4 Number of forward links = 4 Number of back links = 4

TOTALS	FORWARD	BACK	TOTALS
COUNT	700.	760.	1460.
VOLUME	748.	788.	1536.
CHANGE	48.	28.	76.
%	107.	104.	105.

CORREL.  
 COEFF. 0.662 0.717 0.691  
 %RMS 38.90 38.01 38.28  
 r^2 0.438 0.515 0.477  
 GEH 1.8 1.0 2.0

GEH <5 <7 <10 <12 >12  
 # 6 6 8 8 0  
 % 75.0 75.0 100.0 100.0 0.0

Cordon Number : 14  
 Description : 0 Outer Spots (Inbound 1st)

		FORWARD					BACKTOTAL								
NODE1	NODE2	COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%
2140	3526	96.	126	30.	131.2	2.8	119.	83	-36.	69.7	3.6	216.	209	-7.	96.8
1309	1310	45.	36	-9.	80.0	1.4	53.	28	-25.	52.8	3.9	98.	64	-34.	65.3
3064	3060	120.	148	28.	123.3	2.4	128.	141	13.	110.2	1.1	248.	289	41.	116.5
3068	3067	188.	216	28.	114.9	2.0	196.	247	51.	126.0	3.4	384.	463	79.	120.6

Number of links = 4 Number of forward links = 4 Number of back links = 4

TOTALS	FORWARD	BACK	TOTALS
COUNT	449.	496.	946.
VOLUME	526.	499.	1025.
CHANGE	77.	3.	79.
%	117.	101.	108.

CORREL.			
COEFF.	0.985	0.970	0.996
%RMS	25.97	31.89	23.32
r^2	0.970	0.941	0.993
GEH	3.5	0.1	2.5

GEH	<5	<7	<10	<12	>12
#	8	8	8	8	0
%	100.0	100.0	100.0	100.0	0.0

Cordon Number : 15  
Description : 0 ALL COUNTS

		FORWARD					BACKTOTAL								
NODE1	NODE2	COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%
1747	3761	975.	1048	73.	107.5	2.3	937.	1071	134.	114.3	4.2	1912.	2119	207.	110.8
1930	1935	75.	106	31.	141.3	3.3	54.	88	34.	163.0	4.0	129.	194	65.	150.4
1963	1971	30.	40	10.	133.3	1.7	30.	48	18.	160.0	2.9	59.	88	29.	149.2
1829	1839	363.	358	-5.	98.6	0.3	320.	331	11.	103.4	0.6	683.	689	6.	100.9
2038	1998	172.	203	31.	118.0	2.3	164.	198	34.	120.7	2.5	336.	401	65.	119.3
3111	2132	125.	79	-46.	63.2	4.6	123.	85	-38.	69.1	3.7	248.	164	-84.	66.1
1002	2622	59.	81	22.	137.3	2.6	54.	77	23.	142.6	2.8	113.	158	45.	139.8
1836	1835	193.	197	4.	102.1	0.3	222.	246	24.	110.8	1.6	415.	443	28.	106.7
3280	1820	498.	469	-29.	94.2	1.3	425.	420	-5.	98.8	0.2	924.	889	-35.	96.2
1002	2622	59.	81	22.	137.3	2.6	54.	77	23.	142.6	2.8	113.	158	45.	139.8
3057	3058	207.	132	-75.	63.8	5.8	205.	135	-70.	65.9	5.4	412.	267	-145.	64.8
3100	3066	95.	82	-13.	86.3	1.4	103.	87	-16.	84.5	1.6	198.	169	-29.	85.4
2622	1002	54.	77	23.	142.6	2.8	59.	81	22.	137.3	2.6	113.	158	45.	139.8
1668	2746	9.	8	-1.	88.9	0.3	10.	8	-2.	80.0	0.7	19.	16	-3.	84.2
1663	1664	38.	22	-16.	57.9	2.9	21.	20	-1.	95.2	0.2	60.	42	-18.	70.0
1601	1559	218.	193	-25.	88.5	1.7	215.	182	-33.	84.7	2.3	432.	375	-57.	86.8
1362	1375	135.	122	-13.	90.4	1.1	152.	114	-38.	75.0	3.3	287.	236	-51.	82.2
1421	1422	20.	11	-9.	55.0	2.3	21.	11	-10.	52.4	2.5	42.	22	-20.	52.4
1362	1375	135.	122	-13.	90.4	1.1	152.	114	-38.	75.0	3.3	287.	236	-51.	82.2
1580	1579	11.	8	-3.	72.7	1.0	13.	8	-5.	61.5	1.5	24.	16	-8.	66.7
3736	3735	148.	211	63.	142.6	4.7	12.	3	-9.	25.0	3.3	160.	214	54.	133.8
3731	3732	188.	238	50.	126.6	3.4	336.	446	110.	132.7	5.6	524.	684	160.	130.5
3730	3737	301.	314	13.	104.3	0.7	241.	310	69.	128.6	4.2	542.	624	82.	115.1
1745	1760	83.	88	5.	106.0	0.5	88.	86	-2.	97.7	0.2	171.	174	3.	101.8
2680	1693	574.	505	-69.	88.0	3.0	640.	497	-143.	77.7	6.0	1213.	1002	-211.	82.6
1815	1810	202.	152	-50.	75.2	3.8	200.	144	-56.	72.0	4.3	401.	296	-105.	73.8
4408	1745	34.	11	-23.	32.4	4.8	32.	11	-21.	34.4	4.5	66.	22	-44.	33.3
1733	3319	88.	89	1.	101.1	0.1	99.	87	-12.	87.9	1.2	187.	176	-11.	94.1
3343	1164	89.	102	13.	114.6	1.3	97.	101	4.	104.1	0.4	186.	203	17.	109.1
1747	1754	61.	101	40.	165.6	4.4	56.	95	39.	169.6	4.5	117.	196	79.	167.5
2251	3069	156.	150	-6.	96.2	0.5	89.	63	-26.	70.8	3.0	245.	213	-32.	86.9
2325	2679	723.	683	-40.	94.5	1.5	771.	779	8.	101.0	0.3	1495.	1462	-33.	97.8
3744	3307	95.	127	32.	133.7	3.0	94.	131	37.	139.4	3.5	189.	258	69.	136.5
3347	3742	164.	235	71.	143.3	5.0	159.	238	79.	149.7	5.6	323.	473	150.	146.4
1202	2558	205.	185	-20.	90.2	1.4	205.	174	-31.	84.9	2.3	410.	359	-51.	87.6
3343	1164	89.	102	13.	114.6	1.3	97.	101	4.	104.1	0.4	186.	203	17.	109.1
3347	3274	627.	671	44.	107.0	1.7	652.	717	65.	110.0	2.5	1279.	1388	109.	108.5
3906	2513	287.	260	-27.	90.6	1.6	259.	215	-44.	83.0	2.9	547.	475	-72.	86.8
3111	2245	125.	93	-32.	74.4	3.1	123.	87	-36.	70.7	3.5	248.	180	-68.	72.6
1693	2694	212.	206	-6.	97.2	0.4	230.	206	-24.	89.6	1.6	442.	412	-30.	93.2
2970	3085	73.	78	5.	106.8	0.6	84.	77	-7.	91.7	0.8	157.	155	-2.	98.7
3268	3275	144.	248	104.	172.2	7.4	133.	244	111.	183.5	8.1	277.	492	215.	177.6
1921	2274	271.	216	-55.	79.7	3.5	313.	261	-52.	83.4	3.1	584.	477	-107.	81.7
2140	3526	96.	126	30.	131.2	2.8	119.	83	-36.	69.7	3.6	216.	209	-7.	96.8
1309	1310	45.	36	-9.	80.0	1.4	53.	28	-25.	52.8	3.9	98.	64	-34.	65.3
3064	3060	120.	148	28.	123.3	2.4	128.	141	13.	110.2	1.1	248.	289	41.	116.5
3068	3067	188.	216	28.	114.9	2.0	196.	247	51.	126.0	3.4	384.	463	79.	120.6
3761	1747	937.	1071	134.	114.3	4.2	975.	1048	73.	107.5	2.3	1912.	2119	207.	110.8
1935	1930	54.	88	34.	163.0	4.0	75.	106	31.	141.3	3.3	129.	194	65.	150.4
1971	1963	30.	48	18.	160.0	2.9	30.	48	10.	133.3	1.7	59.	88	29.	149.2
1839	1829	320.	331	11.	103.4	0.6	363.	358	-5.	98.6	0.3	683.	689	6.	100.9
1998	2038	164.	198	34.	120.7	2.5	172.	203	31.	118.0	2.3	336.	401	65.	119.3
2132	3111	123.	85	-38.	69.1	3.7	125.	79	-46.	63.2	4.6	248.	164	-84.	66.1
2622	1002	54.	77	23.	142.6	2.8	59.	81	22.	137.3	2.6	113.	158	45.	139.8
1835	1836	222.	246	24.	110.8	1.6	193.	197	4.	102.1	0.3	415.	443	28.	106.7
1820	3280	425.	420	-5.	98.8	0.2	498.	469	-29.	94.2	1.3	924.	889	-35.	96.2
2622	1002	54.	77	23.	142.6	2.8	59.	81	22.	137.3	2.6	113.	158	45.	139.8
3058	3057	205.	135	-70.	65.9	5.4	207.	132	-75.	63.8	5.8	412.	267	-145.	64.8
3066	3100	103.	87	-16.	84.5	1.6	95.	82	-13.	86.3	1.4	198.	169	-29.	85.4
1002	2622	59.	81	22.	137.3	2.6	54.	77	23.	142.6	2.8	113.	158	45.	139.8
2746	1668	10.	8	-2.	80.0	0.7	9.	8	-1.	88.9	0.3	19.	16	-3.	84.2
1664	1663	21.	20	-1.	95.2	0.2	38.	22	-16.	57.9	2.9	60.	42	-18.	70.0
1559	1601	215.	182	-33.	84.7	2.3	218.	193	-25.	88.5	1.7	432.	375	-57.	86.8
1375	1362	152.	114	-38.	75.0	3.3	135.	122	-13.	90.4	1.1	287.	236	-51.	82.2
1422	1421	21.	11	-10.	52.4	2.5	20.	11	-9.	55.0	2.3	42.	22	-20.	52.4
1375	1362	152.	114	-38.	75.0	3.3	135.	122	-13.	90.4	1.1	287.	236	-51.	82.2
1579	1580	13.	8	-3.	72.7	1.0	11.	8	-3.	72.7	1.0	24.	16	-8.	66.7



NODE1	NODE2	FORWARD				BACKTOTAL				COUNT	VOLUME	CHANGE	%	GEH		
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE							%
1747	3761	1331.	1350	19.	101.4	0.5	1133.	1293	160.	114.1	4.6	2464.	2643	179.	107.3	SH6A (West of Yewlett Cres)
1930	1935	201.	120	-81.	59.7	6.4	142.	199	57.	140.1	4.4	344.	319	-25.	92.7	Edinburgh Dr (East of Belfast Tce)
1963	1971	36.	50	14.	138.9	2.1	64.	74	10.	115.6	1.2	100.	124	24.	124.0	Panorama Tce (West of Wakatipu Heights)
1829	1839	443.	354	-89.	79.9	4.5	455.	479	24.	105.3	1.1	898.	833	-65.	92.8	Gorge Rd (South of Sawmill Rd)
2038	1998	222.	220	-2.	99.1	0.1	408.	399	-9.	97.8	0.4	631.	619	-12.	98.1	Fernhill Rd (East of Sainsbury Rd)
3111	2132	182.	73	-109.	40.1	9.7	144.	102	-42.	70.8	3.8	326.	175	-151.	53.7	Glenorchy Qtown Rd (East of Moke Lake Rd)

Number of links = 6 Number of forward links = 6 Number of back links = 6

TOTALS FORWARD BACK TOTALS

COUNT	2415.	2346.	4763.
VOLUME	2167.	2546.	4713.
CHANGE	-248.	200.	-50.
%	90.	109.	99.

CORREL.			
COEFF.	0.994	0.996	0.997
%RMS	18.23	20.26	13.85
r^2	0.988	0.992	0.994
GEH	5.2	4.0	0.7

GEH	<5	<7	<10	<12	>12
#	10	11	12	12	0
%	83.3	91.7	100.0	100.0	0.0

Cordon Number : 4  
Description : 5 EAST OF QUEENSTOWN (twds qtown 1st)

NODE1	NODE2	FORWARD				BACKTOTAL				COUNT	VOLUME	CHANGE	%	GEH		
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE							%
1002	2622	69.	120	51.	173.9	5.2	98.	70	-28.	71.4	3.1	167.	190	23.	113.8	Cadrona Valley Rd (North of Tuohys Gully Rd)
1836	1835	214.	262	48.	122.4	3.1	342.	423	81.	123.7	4.1	556.	685	129.	123.2	SH6 (006009970 Gibbston-before Gibbston Back Rd)
3280	1820	497.	514	17.	103.4	0.8	590.	642	52.	108.8	2.1	1087.	1156	69.	106.3	SH6 (00609997 Btwn Southberg Ave & Bridge)

Number of links = 3 Number of forward links = 3 Number of back links = 3

TOTALS FORWARD BACK TOTALS

COUNT	780.	1030.	1810.
VOLUME	896.	1135.	2031.
CHANGE	116.	105.	221.
%	115.	110.	112.

CORREL.			
COEFF.	1.000	0.990	0.995
%RMS	19.60	20.65	17.36
r^2	0.999	0.981	0.989
GEH	4.0	3.2	5.0

GEH	<5	<7	<10	<12	>12
#	5	6	6	6	0
%	83.3	100.0	100.0	100.0	0.0

Cordon Number : 5  
Description : 6 NORTH OF CROMWEL L AND C (SB/EB 1st)

NODE1	NODE2	FORWARD				BACKTOTAL				COUNT	VOLUME	CHANGE	%	GEH		
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE							%
1002	2622	98.	120	22.	122.4	2.1	69.	70	1.	101.4	0.1	167.	190	23.	113.8	Cadrona Valley Rd (North of Tuohys Gully Rd)
3057	3058	245.	180	-65.	73.5	4.5	307.	216	-91.	70.4	5.6	551.	396	-155.	71.9	SH6 (00600939 Lowburn)
3100	3066	96.	81	-15.	84.4	1.6	70.	65	-5.	92.9	0.6	166.	146	-20.	88.0	SH8 (00800278 Bendigo)

Number of links = 3 Number of forward links = 3 Number of back links = 3

TOTALS FORWARD BACK TOTALS

COUNT	439.	446.	884.
VOLUME	381.	351.	732.
CHANGE	-58.	-95.	-152.
%	87.	79.	83.

CORREL.			
COEFF.	0.925	0.999	0.987
%RMS	33.94	43.35	37.91
r^2	0.855	0.999	0.974
GEH	2.9	4.8	5.3

GEH	<5	<7	<10	<12	>12
#	5	6	6	6	0
%	83.3	100.0	100.0	100.0	0.0

Cordon Number : 6  
Description : 7 WANAKA CORDON (Inbound 1st)

NODE1	NODE2	FORWARD				BACKTOTAL				COUNT	VOLUME	CHANGE	%	GEH		
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE							%
2622	1002	69.	70	1.	101.4	0.1	98.	120	22.	122.4	2.1	167.	190	23.	113.8	Cadrona Valley Rd (North of Tuohys Gully Rd)
1668	2746	51.	11	-40.	21.6	7.2	50.	15	-35.	30.0	6.1	101.	26	-75.	25.7	Mt Barker Rd (West of SH6)
1663	1664	72.	24	-48.	33.3	6.9	52.	31	-21.	59.6	3.3	124.	55	-69.	44.4	Ballantyne Road (West of SH6)
1601	1559	277.	204	-73.	73.6	4.7	235.	274	39.	116.6	2.4	512.	478	-34.	93.4	SH6 (00600895 WANAKA - Telemetry Site 109)
1362	1375	153.	119	-34.	77.8	2.9	217.	208	-9.	95.9	0.6	370.	327	-43.	88.4	SH6 (00600884 Hawea Sth of dam)
1421	1422	29.	23	-6.	79.3	1.2	6.	6	0.	100.0	0.0	35.	29	-6.	82.9	Wanaka Mt Aspiring Rd (West of West Wanaka Rd)

Number of links = 6 Number of forward links = 6 Number of back links = 6

TOTALS	FORWARD	BACK	TOTALS
COUNT	651.	658.	1309.
VOLUME	451.	654.	1105.
CHANGE	-200.	-4.	-204.
%	69.	99.	84.
CORREL.			
COEFF.	0.969	0.978	0.979
%RMS	42.09	24.98	24.22
r^2	0.938	0.957	0.959
GEH	8.5	0.2	5.9

GEH	<5	<7	<10	<12	>12
#	9	11	12	12	0
%	75.0	91.7	100.0	100.0	0.0

Cordon Number : 7  
Description : 8 NORTH OF WANAKA (SB 1st)

NODE1	NODE2	FORWARD					BACKTOTAL					COUNT	VOLUME	CHANGE	%	
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%	GEH					
1362	1375	153.	119	-34.	77.8	2.9	217.	208	-9.	95.9	0.6	370.	327	-43.	88.4	SH6 (00600884 Hawea Sth of dam)
1580	1579	8.	10	2.	125.0	0.7	19.	12	-7.	63.2	1.8	27.	22	-5.	81.5	Kane Rd (Anywhere North of SH8A)

Number of links = 2 Number of forward links = 2 Number of back links = 2

TOTALS	FORWARD	BACK	TOTALS
COUNT	161.	236.	397.
VOLUME	129.	220.	349.
CHANGE	-32.	-16.	-48.
%	80.	93.	88.
CORREL.			
COEFF.	1.000	1.000	1.000
%RMS	42.31	9.66	21.81
r^2	1.000	1.000	1.000
GEH	2.7	1.1	2.5

GEH	<5	<7	<10	<12	>12
#	4	4	4	4	0
%	100.0	100.0	100.0	100.0	0.0

Cordon Number : 8  
Description : 1 Frankton Cordon (Inbound 1st)

NODE1	NODE2	FORWARD					BACKTOTAL					COUNT	VOLUME	CHANGE	%	
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%	GEH					
3736	3735	135.	205	70.	151.9	5.4	11.	1	-10.	9.1	4.1	146.	206	60.	141.1	Hardware Lane (South of SH6)
3731	3732	184.	173	-11.	94.0	0.8	592.	689	97.	116.4	3.8	776.	862	86.	111.1	EAR Spine (South of SH6)
3730	3737	459.	360	-99.	78.4	4.9	517.	492	-25.	95.2	1.1	975.	852	-123.	87.4	Grants Rd (South of SH6)
1745	1760	134.	73	-61.	54.5	6.0	117.	120	3.	102.6	0.3	251.	193	-58.	76.9	Joe Oconnell Dr (South of SH6)
2680	1693	398.	392	-6.	98.5	0.3	509.	630	121.	123.8	5.1	908.	1022	114.	112.6	Lucas Pl (East of SH6)
1815	1810	171.	220	49.	128.7	3.5	291.	247	-44.	84.9	2.7	463.	467	4.	100.9	Humphrey St (East of SH6)

Number of links = 6 Number of forward links = 6 Number of back links = 6

TOTALS	FORWARD	BACK	TOTALS
COUNT	1481.	2037.	3519.
VOLUME	1423.	2179.	3602.
CHANGE	-58.	142.	83.
%	96.	107.	102.
CORREL.			
COEFF.	0.897	0.980	0.968
%RMS	26.24	21.53	15.72
r^2	0.805	0.959	0.936
GEH	1.5	3.1	1.4

GEH	<5	<7	<10	<12	>12
#	9	12	12	12	0
%	75.0	100.0	100.0	100.0	0.0

Cordon Number : 9  
Description : 2 Frankton North SH6 (SB/EB 1st)

NODE1	NODE2	FORWARD					BACKTOTAL					COUNT	VOLUME	CHANGE	%	
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE	%	GEH					
4408	1745	29.	15	-14.	51.7	3.0	18.	14	-4.	77.8	1.0	47.	29	-18.	61.7	Hansen Rd (North of SH6)
1733	3319	87.	109	22.	125.3	2.2	139.	174	35.	125.2	2.8	226.	283	57.	125.2	Tucker Beach Rd (North of SH6)
3343	1164	116.	139	23.	119.8	2.0	89.	150	61.	168.5	5.6	205.	289	84.	141.0	Lower Shotover Rd (North of Spence Rd)

Number of links = 3 Number of forward links = 3 Number of back links = 3

TOTALS	FORWARD	BACK	TOTALS
COUNT	232.	246.	478.
VOLUME	263.	338.	601.
CHANGE	31.	92.	123.
%	113.	137.	126.
CORREL.			
COEFF.	0.995	0.960	0.992
%RMS	31.79	60.74	45.75
r^2	0.990	0.921	0.984
GEH	2.0	5.4	5.3

GEH <5 <7 <10 <12 >12  
 # 5 6 6 6 0  
 % 83.3 100.0 100.0 100.0 0.0

Cordon Number : 10  
 Description : 3 Frankton South Frankton Rd and SH6 (SB)

NODE1	NODE2	FORWARD				GEH	BACKTOTAL				COUNT	VOLUME	CHANGE	%		
		COUNT	VOLUME	CHANGE	%		COUNT	VOLUME	CHANGE	%						
1747	1754	199.	135	-64.	67.8	5.0	105.	122	17.	116.2	1.6	304.	257	-47.	84.5	Yewlett Cres (South of SH6A)
2251	3069	129.	177	48.	137.2	3.9	141.	126	-15.	89.4	1.3	270.	303	33.	112.2	McBride St (South of SH6A)
2325	2679	665.	731	66.	109.9	2.5	780.	859	79.	110.1	2.8	1445.	1590	145.	110.0	SH6 (South of Gray St)
1745	1760	134.	73	-61.	54.5	6.0	117.	120	3.	102.6	0.3	251.	193	-58.	76.9	Joe Oconnell Dr (South of SH6)
3730	3737	459.	360	-99.	78.4	4.9	517.	492	-25.	95.2	1.1	975.	852	-123.	87.4	Grants Rd (South of SH6)
3731	3732	184.	173	-11.	94.0	0.8	592.	689	97.	116.4	3.8	776.	862	86.	111.1	EAR Spine (South of SH6)
3736	3735	135.	205	70.	151.9	5.4	11.	1	-10.	9.1	4.1	146.	206	60.	141.1	Hardware Lane (South of SH6)
3744	3307	214.	312	98.	145.8	6.0	100.	135	35.	135.0	3.2	314.	447	133.	142.4	Stalker Rd (South of SH6)
3347	3742	423.	452	29.	106.9	1.4	180.	256	76.	142.2	5.1	602.	708	106.	117.6	Howards Dr (South of SH6)

Number of links = 9 Number of forward links = 9 Number of back links = 9

TOTALS	FORWARD	BACK	TOTALS
COUNT	2542.	2543.	5083.
VOLUME	2618.	2800.	5418.
CHANGE	76.	257.	335.
%	103.	110.	107.

CORREL.			
COEFF.	0.939	0.991	0.980
%RMS	24.96	19.34	18.01
r^2	0.882	0.983	0.960
GEH	1.5	5.0	4.6

GEH <5 <7 <10 <12 >12  
 # 14 18 18 18 0  
 % 77.8 100.0 100.0 100.0 0.0

Cordon Number : 11  
 Description : 0 At BP Rbt (SB/EB 1st)

NODE1	NODE2	FORWARD				GEH	BACKTOTAL				COUNT	VOLUME	CHANGE	%		
		COUNT	VOLUME	CHANGE	%		COUNT	VOLUME	CHANGE	%						
1747	1754	199.	135	-64.	67.8	5.0	105.	122	17.	116.2	1.6	304.	257	-47.	84.5	Yewlett Cres (South of SH6A)
2251	3069	129.	177	48.	137.2	3.9	141.	126	-15.	89.4	1.3	270.	303	33.	112.2	McBride St (South of SH6A)
2325	2679	665.	731	66.	109.9	2.5	780.	859	79.	110.1	2.8	1445.	1590	145.	110.0	SH6 (South of Gray St)

Number of links = 3 Number of forward links = 3 Number of back links = 3

TOTALS	FORWARD	BACK	TOTALS
COUNT	993.	1026.	2019.
VOLUME	1043.	1107.	2150.
CHANGE	50.	81.	131.
%	105.	108.	106.

CORREL.			
COEFF.	0.983	0.999	0.998
%RMS	22.16	16.99	16.39
r^2	0.967	0.998	0.997
GEH	1.6	2.5	2.9

GEH <5 <7 <10 <12 >12  
 # 6 6 6 6 0  
 % 100.0 100.0 100.0 100.0 0.0

Cordon Number : 12  
 Description : 9 OUTER QUEENSTOWN (Inbound 1st)

NODE1	NODE2	FORWARD				GEH	BACKTOTAL				COUNT	VOLUME	CHANGE	%		
		COUNT	VOLUME	CHANGE	%		COUNT	VOLUME	CHANGE	%						
1202	2558	310.	173	-137.	55.8	8.8	280.	269	-11.	96.1	0.7	590.	442	-148.	74.9	Arthurs Pt Rd (North of Morning Star Tce)
3343	1164	116.	139	23.	119.8	2.0	89.	150	61.	168.5	5.6	205.	289	84.	141.0	Lower Shotover Rd (North of Spence Rd)
3347	3274	702.	707	5.	100.7	0.2	1003.	961	-42.	95.8	1.3	1706.	1668	-38.	97.8	SH6 (East of Lower Shotover Road)
3906	2513	302.	320	18.	106.0	1.0	309.	326	17.	105.5	1.0	611.	646	35.	105.7	SH6 (00001000 Remarkables after ski field)
3111	2245	182.	112	-70.	61.5	5.8	144.	93	-51.	64.6	4.7	326.	205	-121.	62.9	Glenorchy Qtown Rd (East of Moke Lake Rd)

Number of links = 5 Number of forward links = 5 Number of back links = 5

TOTALS	FORWARD	BACK	TOTALS
COUNT	1612.	1825.	3438.
VOLUME	1451.	1799.	3250.
CHANGE	-161.	-26.	-188.
%	90.	99.	95.

CORREL.			
COEFF.	0.960	0.993	0.986
%RMS	24.30	12.63	15.64
r^2	0.922	0.987	0.972
GEH	4.1	0.6	3.3

GEH <5 <7 <10 <12 >12  
 # 7 9 10 10 0  
 % 70.0 90.0 100.0 100.0 0.0

Cordon Number : 13  
 Description : 10 Frankton Spots (SB/EB 1st)



NODE1	NODE2	FORWARD				BACKTOTAL				COUNT	VOLUME	CHANGE	%	GEH		
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE							%
1693	2694	103.	112	9.	108.7	0.9	167.	169	2.	101.2	0.2	271.	281	10.	103.7	Airport (East of Lucas Pl)
2970	3085	84.	97	13.	115.5	1.4	157.	160	3.	101.9	0.2	240.	257	17.	107.1	Ferry Hill Dr (West of Tucker Beach Rd)
3268	3275	142.	254	112.	178.9	8.0	224.	375	151.	167.4	8.7	366.	629	263.	171.9	Peninsula Rd (West of SH6)
1921	2274	321.	329	8.	102.5	0.4	315.	321	6.	101.9	0.3	636.	650	14.	102.2	SH6 (00600999 Sth of Peninsula Rd)

Number of links = 4 Number of forward links = 4 Number of back links = 4

TOTALS FORWARD BACK TOTALS

COUNT	650.	863.	1513.
VOLUME	792.	1025.	1817.
CHANGE	142.	162.	304.
%	122.	119.	120.

CORREL.

COEFF.	0.894	0.736	0.814
%RMS	40.29	40.45	40.31
r^2	0.799	0.541	0.662
GEH	5.3	5.3	7.5

GEH <5	<7	<10	<12	>12
#	6	6	8	8
%	75.0	75.0	100.0	100.0

Cordon Number : 14

Description : 0 Outer Spots (Inbound 1st)

NODE1	NODE2	FORWARD				BACKTOTAL				COUNT	VOLUME	CHANGE	%	GEH		
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE							%
2140	3526	108.	188	80.	174.1	6.6	166.	98	-68.	59.0	5.9	274.	286	12.	104.4	00601005 (Between Jacks Point and Lakeside)
1309	1310	52.	54	2.	103.8	0.3	24.	27	3.	112.5	0.6	77.	81	4.	105.2	00600853 Lake Wanaka Camp Creek Bridge
3064	3060	106.	163	57.	153.8	4.9	59.	114	55.	193.2	5.9	165.	277	112.	167.9	00800263 TARRAS - Telemetry Site 110
3068	3067	222.	261	39.	117.6	2.5	370.	364	-6.	98.4	0.3	592.	625	33.	105.6	00800313 Cromwell Gorge

Number of links = 4 Number of forward links = 4 Number of back links = 4

TOTALS FORWARD BACK TOTALS

COUNT	488.	619.	1108.
VOLUME	666.	603.	1269.
CHANGE	178.	-16.	161.
%	136.	97.	115.

CORREL.

COEFF.	0.928	0.946	0.976
%RMS	50.02	32.73	24.48
r^2	0.861	0.895	0.953
GEH	7.4	0.6	4.7

GEH <5	<7	<10	<12	>12
#	5	8	8	0
%	62.5	100.0	100.0	100.0

Cordon Number : 15

Description : 0 ALL COUNTS

NODE1	NODE2	FORWARD				BACKTOTAL				COUNT	VOLUME	CHANGE	%	GEH		
		COUNT	VOLUME	CHANGE	%	GEH	COUNT	VOLUME	CHANGE							%
1747	3761	1331.	1350	19.	101.4	0.5	1133.	1293	160.	114.1	4.6	2464.	2643	179.	107.3	SH6A (West of Yewlett Cres)
1930	1935	201.	120	-81.	59.7	6.4	142.	199	57.	140.1	4.4	344.	319	-25.	92.7	Edinburgh Dr (East of Belfast Tce)
1963	1971	36.	50	14.	138.9	2.1	64.	74	10.	115.6	1.2	100.	124	24.	124.0	Panorama Tce (West of Wakatipu Heights)
1829	1839	443.	354	-89.	79.9	4.5	455.	479	24.	105.3	1.1	898.	833	-65.	92.8	Gorge Rd (South of Sawmill Rd)
2038	1998	222.	220	-2.	99.1	0.1	408.	399	-9.	97.8	0.4	631.	619	-12.	98.1	Fernhill Rd (East of Sainsbury Rd)
3111	2132	182.	73	-109.	40.1	9.7	144.	102	-42.	70.8	3.8	326.	175	-151.	53.7	Glenorchy Qtown Rd (East of Moke Lake Rd)
1002	2622	69.	120	51.	173.9	5.2	98.	70	-28.	71.4	3.1	167.	190	23.	113.8	Cadrona Valley Rd (North of Tuohys Gully Rd)
1836	1835	214.	262	48.	122.4	3.1	342.	423	81.	123.7	4.1	556.	685	129.	123.2	SH6 (00600970 Gibbston-before Gibbston Back Rd)
3280	1820	497.	514	17.	103.4	0.8	590.	642	52.	108.8	2.1	1087.	1156	69.	106.3	SH6 (00609997 Btwn Southberg Ave & Bridge)
1002	2622	98.	120	22.	122.4	2.1	69.	70	1.	101.4	0.1	167.	190	23.	113.8	Cadrona Valley Rd (North of Tuohys Gully Rd)
3057	3058	245.	180	-65.	73.5	4.5	307.	216	-91.	70.4	5.6	551.	396	-155.	71.9	SH6 (00600939 Lowburn)
3100	3066	96.	81	-15.	84.4	1.6	70.	65	-5.	92.9	0.6	166.	146	-20.	88.0	SH8 (00800278 Bendigo)
2622	1002	69.	70	1.	101.4	0.1	98.	120	22.	122.4	2.1	167.	190	23.	113.8	Cadrona Valley Rd (North of Tuohys Gully Rd)
1668	2746	51.	11	-40.	21.6	7.2	50.	15	-35.	30.0	6.1	101.	26	-75.	25.7	Mt Barker Rd (West of SH6)
1663	1664	72.	24	-48.	33.3	6.9	52.	31	-21.	59.6	3.3	124.	55	-69.	44.4	Ballantyne Road (West of SH6)
1601	1559	277.	204	-73.	73.6	4.7	235.	274	39.	116.6	2.4	512.	478	-34.	93.4	SH6 (00600895 WANAKA - Telemetry Site 109)
1362	1375	153.	119	-34.	77.8	2.9	217.	208	-9.	95.9	0.6	370.	327	-43.	88.4	SH6 (00600884 Hawea Sth of dam)
1421	1422	29.	23	-6.	79.3	1.2	6.	6	0.	100.0	0.0	35.	29	-6.	82.9	Wanaka Mt Aspiring Rd (West of West Wanaka Rd)
1362	1375	153.	119	-34.	77.8	2.9	217.	208	-9.	95.9	0.6	370.	327	-43.	88.4	SH6 (00600884 Hawea Sth of dam)
1580	1579	8.	10	2.	125.0	0.7	19.	12	-7.	63.2	1.8	27.	22	-5.	81.5	Kane Rd (Anywhere North of SH8A)
3736	3735	135.	205	70.	151.9	5.4	11.	1	-10.	9.1	4.1	146.	206	60.	141.1	Hardware Lane (South of SH6)
3731	3732	184.	173	-11.	94.0	0.8	592.	689	97.	116.4	3.8	776.	862	86.	111.1	EAR Spine (South of SH6)
3730	3737	459.	360	-99.	78.4	4.9	517.	492	-25.	95.2	1.1	975.	852	-123.	87.4	Grants Rd (South of SH6)
1745	1760	134.	73	-61.	54.5	6.0	117.	120	3.	102.6	0.3	251.	193	-58.	76.9	Joe Oconnell Dr (South of SH6)
2680	1693	398.	392	-6.	98.5	0.3	509.	630	121.	123.8	5.1	908.	1022	114.	112.6	Lucas Pl (East of SH6)
1815	1810	171.	220	49.	128.7	3.5	291.	247	-44.	84.9	2.7	463.	467	4.	100.9	Humphrey St (East of SH6)
4408	1745	29.	15	-14.	51.7	3.0	18.	14	-4.	77.8	1.0	47.	29	-18.	61.7	Hansen Rd (North of SH6)
1733	3319	87.	109	22.	125.3	2.2	139.	174	35.	125.2	2.8	226.	283	57.	125.2	Tucker Beach Rd (North of SH6)
3343	1164	116.	139	23.	119.8	2.0	89.	150	61.	168.5	5.6	205.	289	84.	141.0	Lower Shotover Rd (North of Spence Rd)
1747	1754	199.	135	-64.	67.8	5.0	105.	122	17.	116.2	1.6	304.	257	-47.	84.5	Yewlett Cres (South of SH6A)
2251	3069	129.	177	48.	137.2	3.9	141.	126	-15.	89.4	1.3	270.	303	33.	112.2	McBride St (South of SH6A)
2325	2679	665.	731	66.	109.9	2.5	780.	859	79.	110.1	2.8	1445.	1590	145.	110.0	SH6 (South of Gray St)
3744	3307	214.	312	98.	145.8	6.0	100.	135	35.	135.0	3.2	314.	447	133.	142.4	Stalker Rd (South of SH6)
3347	3742	423.	452	29.	106.9	1.4	180.	256	76.	142.2	5.1	602.	708	106.	117.6	Howards Dr (South of SH6)
1202	2558	310.	173	-137.	55.8	8.8	280.	269	-11.	96.1	0.7	590.	442	-148.	74.9	Arthurs Pt Rd (North of Morning Star Tce)
3343	1164	116.	139	23.	119.8	2.0	89.	150	61.	168.5	5.6	205.	289	84.	141.0	Lower Shotover Rd (North of Spence Rd)
3347	3274	702.	707	5.	100.7	0.2	1003.	961	-42.	95.8	1.3	1706.	1668	-38.	97.8	SH6 (East of Lower Shotover Road)
3906	2513	302.	320	18.	106.0	1.0	309.	326	17.	105.5	1.0	611.	646	35.	105.7	SH6 (00801000 Remarkables after ski field)

3111	2245	182.	112	-70.	61.5	5.8	144.	93	-51.	64.6	4.7	326.	205	-121.	62.9	Glenorchy Qtown Rd (East of Moke Lake Rd)
1693	2694	103.	112	9.	108.7	0.9	167.	169	2.	101.2	0.2	271.	281	10.	103.7	Airport (East of Lucas Pl)
2970	3085	84.	97	13.	115.5	1.4	157.	160	3.	101.9	0.2	240.	257	17.	107.1	Ferry Hill Dr (West of Tucker Beach Rd)
3268	3275	142.	254	112.	178.9	8.0	224.	375	151.	167.4	8.7	366.	629	263.	171.9	Peninsula Rd (West of SH6)
1921	2274	321.	329	8.	102.5	0.4	315.	321	6.	101.9	0.3	636.	650	14.	102.2	SH6 (00600999 Sth of Peninsula Rd)
2140	3526	108.	188	80.	174.1	6.6	166.	98	-68.	59.0	5.9	274.	286	12.	104.4	00601005 (Between Jacks Point and Lakeside)
1309	1310	52.	54	2.	103.8	0.3	24.	27	3.	112.5	0.6	77.	81	4.	105.2	00600853 Lake Wanaka Camp Creek Bridge
3064	3060	106.	163	57.	153.8	4.9	59.	114	55.	193.2	5.9	165.	277	112.	167.9	00800263 TARRAS - Telemetry Site 110
3068	3067	222.	261	39.	117.6	2.5	370.	364	-6.	98.4	0.3	592.	625	33.	105.6	00800313 Cromwell Gorge
3761	1747	1133.	1293	160.	114.1	4.6	1331.	1350	19.	101.4	0.5	2464.	2643	179.	107.3	SH6A (West of Yewlett Cres)
1935	1930	142.	199	57.	140.1	4.4	201.	120	-81.	59.7	6.4	344.	319	-25.	92.7	Edinburgh Dr (East of Belfast Tce)
1971	1963	64.	74	10.	115.6	1.2	36.	50	14.	138.9	2.1	100.	124	24.	124.0	Panorama Tce (West of Wakatipu Heights)
1839	1829	455.	479	24.	105.3	1.1	443.	354	-89.	79.9	4.5	898.	833	-65.	92.8	Gorge Rd (South of Sawmill Rd)
1998	2038	408.	399	-9.	97.8	0.4	222.	220	-2.	99.1	0.1	631.	619	-12.	98.1	Fernhill Rd (East of Sainsbury Rd)
2132	3111	144.	102	-42.	70.8	3.8	182.	73	-109.	40.1	9.7	326.	175	-151.	53.7	Glenorchy Qtown Rd (East of Moke Lake Rd)
2622	1002	98.	70	-28.	71.4	3.1	69.	120	51.	173.9	5.2	167.	190	23.	113.8	Cadrona Valley Rd (North of Tuohys Gully Rd)
1835	1836	342.	423	81.	123.7	4.1	214.	262	48.	122.4	3.1	556.	685	129.	123.2	SH6 (00600970 Gibbston-before Gibbston Back Rd)
1820	3280	590.	642	52.	108.8	2.1	497.	514	17.	103.4	0.8	1087.	1156	69.	106.3	SH6 (00699997 Btwn Southberg Ave & Bridge)
2622	1002	69.	70	1.	101.4	0.1	98.	120	22.	122.4	2.1	167.	190	23.	113.8	Cadrona Valley Rd (North of Tuohys Gully Rd)
3058	3057	307.	216	-91.	70.4	5.6	245.	180	-65.	73.5	4.5	551.	396	-155.	71.9	SH6 (00600939 Lowburn)
3066	3100	70.	65	-5.	92.9	0.6	96.	81	-15.	84.4	1.6	166.	146	-20.	88.0	SH8 (00800278 Bendigo)
1002	2622	98.	120	22.	122.4	2.1	69.	70	1.	101.4	0.1	167.	190	23.	113.8	Cadrona Valley Rd (North of Tuohys Gully Rd)
2746	1668	50.	15	-35.	30.0	6.1	51.	11	-40.	21.6	7.2	101.	26	-75.	25.7	Mt Barker Rd (West of SH6)
1664	1663	52.	31	-21.	59.6	3.3	72.	24	-48.	33.3	6.9	124.	55	-69.	44.4	Ballantyne Road (West of SH6)
1559	1601	235.	274	39.	116.6	2.4	277.	204	-73.	73.6	4.7	512.	478	-34.	93.4	SH6 (00600895 WANAKA - Telemetry Site 109)
1375	1362	217.	208	-9.	95.9	0.6	153.	119	-34.	77.8	2.9	370.	327	-43.	88.4	SH6 (00600884 Hawea Sth of dam)
1422	1421	6.	6	0.	100.0	0.0	29.	23	-6.	79.3	1.2	35.	29	-6.	82.9	Wanaka Mt Aspiring Rd (West of West Wanaka Rd)
1375	1362	217.	208	-9.	95.9	0.6	153.	119	-34.	77.8	2.9	370.	327	-43.	88.4	SH6 (00600884 Hawea Sth of dam)
1579	1580	19.	12	-7.	63.2	1.8	8.	10	2.	125.0	0.7	27.	22	-5.	81.5	Kane Rd (Anywhere North of SH8A)
3735	3736	11.	1	-10.	9.1	4.1	135.	205	70.	151.9	5.4	146.	206	60.	141.1	Hardware Lane (South of SH6)
3732	3731	592.	689	97.	116.4	3.8	184.	173	-11.	94.0	0.8	776.	862	86.	111.1	EAR Spine (South of SH6)
3737	3730	517.	492	-25.	95.2	1.1	459.	360	-99.	78.4	4.9	975.	852	-123.	87.4	Grants Rd (South of SH6)
1760	1745	117.	120	3.	102.6	0.3	134.	73	-61.	54.5	6.0	251.	193	-58.	76.9	Joe Oconnell Dr (South of SH6)
1693	2680	509.	630	121.	123.8	5.1	398.	392	-6.	98.5	0.3	908.	1022	114.	112.6	Lucas Pl (East of SH6)
1810	1815	291.	247	-44.	84.9	2.7	171.	220	49.	128.7	3.5	463.	467	4.	100.9	Humphrey St (East of SH6)
1745	4408	18.	14	-4.	77.8	1.0	29.	15	-14.	51.7	3.0	47.	29	-18.	61.7	Hansen Rd (North of SH6)
3319	1733	139.	174	35.	125.2	2.8	87.	109	22.	125.3	2.2	226.	283	57.	125.2	Tucker Beach Rd (North of SH6)
1164	3343	89.	150	61.	168.5	5.6	116.	139	23.	119.8	2.0	205.	289	84.	141.0	Lower Shotover Rd (North of Spence Rd)
1754	1747	105.	122	17.	116.2	1.6	199.	135	-64.	67.8	5.0	304.	257	-47.	84.5	Yewlett Cres (South of SH6A)
3069	2251	141.	126	-15.	89.4	1.3	129.	177	48.	137.2	3.9	270.	303	33.	112.2	McBride St (South of SH6A)
2679	2325	780.	859	79.	110.1	2.8	665.	731	66.	109.9	2.5	1445.	1590	145.	110.0	SH6 (South of Gray St)
3307	3744	100.	135	35.	135.0	3.2	214.	312	98.	145.8	6.0	314.	447	133.	142.4	Stalker Rd (South of SH6)
3742	3347	180.	256	76.	142.2	5.1	423.	452	29.	106.9	1.4	602.	708	106.	117.6	Howards Dr (South of SH6)
2558	1202	280.	269	-11.	96.1	0.7	310.	173	-137.	55.8	8.8	590.	442	-148.	74.9	Arthurs Pt Rd (North of Morning Star Tce)
1164	3343	89.	150	61.	168.5	5.6	116.	139	23.	119.8	2.0	205.	289	84.	141.0	Lower Shotover Rd (North of Spence Rd)
3274	3347	1003.	961	-42.	95.8	1.3	702.	707	5.	100.7	0.2	1706.	1668	-38.	97.8	SH6 (East of Lower Shotover Road)
2513	3906	309.	326	17.	105.5	1.0	302.	320	18.	106.0	1.0	611.	646	35.	105.7	SH6 (00601000 Remarkables after ski field)
2245	3111	144.	93	-51.	64.6	4.7	182.	112	-70.	61.5	5.8	326.	205	-121.	62.9	Glenorchy Qtown Rd (East of Moke Lake Rd)
2694	1693	167.	169	2.	101.2	0.2	103.	112	9.	108.7	0.9	271.	281	10.	103.7	Airport (East of Lucas Pl)
3085	2970	157.	160	3.	101.9	0.2	84.	97	13.	115.5	1.4	240.	257	17.	107.1	Ferry Hill Dr (West of Tucker Beach Rd)
3275	3268	224.	375	151.	167.4	8.7	142.	254	112.	178.9	8.0	366.	629	263.	171.9	Peninsula Rd (West of SH6)
2274	1921	315.	321	6.	101.9	0.3	321.	329	8.	102.5	0.4	636.	650	14.	102.2	SH6 (00600999 Sth of Peninsula Rd)
3526	2140	166.	98	-68.	59.0	5.9	108.	188	80.	174.1	6.6	274.	286	12.	104.4	00601005 (Between Jacks Point and Lakeside)
1310	1309	24.	27	3.	112.5	0.6	52.	54	2.	103.8	0.3	77.	81	4.	105.2	00600853 Lake Wanaka Camp Creek Bridge
3060	3064	59.	114	55.	193.2	5.9	106.	163	57.	153.8	4.9	165.	277	112.	167.9	00800263 TARRAS - Telemetry Site 110
3067	3068	370.	364	-6.	98.4	0.3	222.	261	39.	117.6	2.5	592.	625	33.	105.6	00800313 Cromwell Gorge

Number of links = 94 Number of forward links = 94 Number of back links = 94

TOTALS	FORWARD	BACK	TOTALS
COUNT	22151.	22151.	44308.
VOLUME	22774.	22774.	45548.
CHANGE	623.	623.	1240.
%	103.	103.	103.
CORREL.			
COEFF.	0.977	0.977	0.985
%RMS	23.23	23.23	18.65
r^2	0.955	0.955	0.970
GEH	4.2	4.2	5.9
GEH <5	<7	<10	<12
#	146	178	188
%	77.7	94.7	100.0
			100.0
			0.0

CORDON terminated successfully