BEFORE THE INDEPENDENT HEARING PANEL APPOINTED BY THE QUEENSTOWN LAKES DISTRICT COUNCIL

UNDER	the Resource Management Act 1991 (RMA)
IN THE MATTER	of the Te Pūtahi Ladies Mile Plan Variation in accordance with section 80B and 80C, and Part 5 of Schedule 1 of the Resource Management Act 1991.

STATEMENT OF EVIDENCE OF COLIN ROBERT SHIELDS
29 September 2023

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WYNN WILLIAMS

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Introduction

1 My name is Colin Robert Shields.

2 I am a Senior Principal Transport Planner at Tonkin + Taylor Limited (**T+T**) and I have held this position since November 2021. Prior to joining T+T, I was a Senior Engineer with Candor 3 Limited (**C3**).

3 I have been asked to provide evidence by Queenstown Lakes District Council (**QLDC** or **Council**).

4 I have been involved in the Te Pūtahi Ladies Mile Masterplan (**TPLM Masterplan**) and Plan Variation (**TPLM Variation**) since the commencement of the contract awarded to the Ladies Mile Consortium (**LMC**) in August 2020, through to the present day. The LMC consists of C3, Studio Pacific Architecture and Brown and Co. Working as part of the LMC, I was the lead transport planner and I was responsible for preparing the Transport Strategy. The Transport Strategy was used to inform and support the TPLM Masterplan and the TPLM Variation provisions (and was appended to the section 32 Report as Appendix 3A(i)).

5 I am familiar with the TPLM Variation site (**Site**) and the surrounding transport network and I have visited the Site on numerous occasions between August 2020 and the present day.

Qualifications and experience

6 I hold the qualification of Master of Science in Transport Engineering from the University of Newcastle Upon Tyne (UK). I am a Chartered Professional Engineer (CPEng) with Engineering NZ and I am a Chartered Member of Engineering NZ (CMEngNZ).

7 I have 35 years transport planning and engineering experience gained within New Zealand and internationally, managing the appraisal, design, and delivery of a wide range of transport projects and providing transport planning inputs to the master planning, consenting (under the Resource Management Act 1991 (**RMA**), design and delivery of residential, commercial and education land development projects.

Code of conduct

8 I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2023. Accordingly, I

have complied with the Code in the preparation of this evidence, and will follow it when presenting evidence at the hearing. Unless I state otherwise, this assessment is within my area of expertise, and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

Scope of evidence

9 My evidence addresses the following:

(a) Summarises the findings of the Transport Strategy.

(b) Summarises the findings from additional transport assessment work carried out, subsequent to the Transport Strategy.

(c) Summarises the transport related TPLM Variation provisions.

(d) Responds to the submissions received, relevant to my evidence.

10 In preparing my evidence, I have relied on the following:

(a) The Transport Strategy dated 8 March 2022.

(b) Transport strategy and policy documents referenced in my evidence and in the Transport Strategy.

(c) StatsNZ Census Data.

(d) The Way To Go Partners Queenstown Strategic Transport Model.

(e) The Way To Go Partners Public Transport Model.

(f) Site visits, aerial photographs and other online resources/websites.

(g) Way To Go Partners Bluetooth journey time data, bus journey time data, bus patronage data and traffic count data.

(h) NZ and international transport research referenced within the Transport Strategy.

Executive summary

11 The Transport Strategy was developed concurrently with the TPLM Masterplan and was then used to inform the transport related TPLM Variation provisions. The Transport Strategy included key findings on the existing transport conditions which showed AM peak period westbound queuing from the Shotover Bridge to east of Howards Drive, essential community services are located west of the Shotover Bridge,

high car ownership rates and high dependency on car use. During the school holidays queue lengths are much smaller.

12 The Transport Strategy analysed the key transport policy and strategy documents. Several key drivers and themes from these documents were incorporated into the TPLM Masterplan including encouraging good quality, compact, mixed use urban development to support densities that can support frequent public transport and making shared and active modes more attractive. Following a review of these approved transport strategy documents, a mode share target of up to 50% of the external trips from TPLM Masterplan area by non-car modes of transport was derived. The Transport Strategy also outlined the opportunity for mode shift from Shotover Country and Lake Hayes Estate with the provision of community facilities within easy walk, cycle and bus distance at TPLM, thus avoiding the need for these residents to drive across the Shotover Bridge to access these facilities.

13 The overall vision for the Transport Strategy for TPLM is to create an accessible, healthy, safe and sustainable TPLM community by reducing reliance on car use, by providing a well-connected street network to local community facilities and invest in active and public transport modes so that walking, cycling and bus use are everyone's first travel choice.

14 In order to implement this vision, the Transport Strategy details the transport interventions required. These transport interventions are included in the TPLM Variation provisions, including internal street cross sections providing a safe, healthy and attractive urban environment to promote walking and cycling, SH6 cross sections providing a safe, healthy and attractive urban environment to promote walking, cycling and bus use on SH6, a bus routing strategy, maximum on site car parking rates, minimum cycle parking and end of trip facilities, vehicular access provided via the NZUP proposed SH6/Howards Drive roundabout, a new roundabout at Lower Shotover Road/Spence Road and a new roundabout to the east of the existing #516 Ladies Mile driveway, and walking and cycling improvements. These would complement Way to Go partners investment in active and public transport modes and travel behaviour change/transport demand management measures.

15 Based on the modelling work carried out within the Transport Strategy, in my opinion, the TPLM Variation will not give rise to adverse effects on

the adjacent and wider road network, and can be appropriately mitigated as development at the TPLM Variation Site progresses. Following discussions in July 2023 with Waka Kotahi and QLDC, the modelling work undertaken as part of the Transport Strategy has been updated. This recent additional modelling work has not affected my conclusions in the Transport Strategy and I consider that the transport impact of TPLM (with the proposed transport interventions and Way To Go partner measures) will be acceptable and will be managed such that the safe, effective and efficient operation of the transport network can be achieved.

16 I consider the transport related TPLM Variation provisions informed by the Transport Strategy will enable delivery of an integrated urban environment, support key Kāi Tahu values, promote reduction in reliance on private vehicle trips and provide a safe and efficient transport network.

17 I have reviewed and addressed the significant number of submissions that relate to transport matters. I have addressed several submissions separately, for example Waka Kotahi's submission, and then addressed other submissions in groups where submissions raised similar themes. No submissions have materially altered my opinions set out in the Transport Strategy.

Transport Strategy - Background

18 The Transport Strategy was developed concurrently with the TPLM Masterplan and was then used to inform the transport related TPLM Variation provisions. The Transport Strategy used data that was available at that time of preparing the TPLM Masterplan to provide evidence of the effectiveness of the overall Transport Strategy.

19 As such, the Transport Strategy was intended to be an overarching document guiding development of the TPLM Masterplan rather than providing a more granular level of assessment which would normally be carried out within a Transport Assessment. In accordance with existing QLDC District Plan (29.7.7.1) requirements it is the intention that subsequent resource consent applications for development on the site would provide this granular level of transport assessment detail once more exact development details are known.

20 Accordingly, I consider the assessment and findings of the Transport Strategy appropriate to support the proposed TPLM Variation provisions on the basis that more detailed Transport Assessments are carried out as part of future resource consent applications.

Transport Strategy - Key findings

Existing Transport Conditions

21 The Transport Strategy provided a detailed description of the existing transport conditions on SH6 Ladies Mile and the adjacent existing communities of Shotover Country and Lake Hayes Estate. Key findings from this assessment included:

(a) Essential community facilities are all on the west side of Shotover bridge.

(b) On Shotover Bridge, traffic flows were observed to be 1,451 vehicles in the AM peak hour westbound and 1,255 in the PM peak hour eastbound. Waka Kotahi has indicated the capacity of the bridge is 1,700 vehicles/hour.

(c) Ministry of Education (**MoE**) data indicates that approximately 870 students reside east of Shotover Bridge and attend schools to the west. The Transport Strategy estimated that trips to schools represent approximately 19% of the AM peak westbound traffic flow on Shotover Bridge.

(d) AM peak period queues westbound (towards Frankton) block back from Shotover Bridge typically up to the SH6/Howards Drive intersection. Queues also block back on Stalker Road typically to the primary school and on Howards Drive typically to Jones Avenue. During the school holidays queue lengths are much smaller.

(e) High car ownership rates (with circa 96% of households owning at least 1 car) and high dependency on car use with 78% of journeys to work being driving car alone.

(f) Given the absence of any bus lanes bus passengers experience the same delays as car drivers which impacts on bus reliability. Bus patronage is low compared to use of private vehicles and declined during 2020-2022 due to Covid and bus driver shortages.

However, ORC data indicates that with the re-introduction of full timetables in Queenstown in June 2023, bus patronage is higher than pre-Covid levels.

(g) There are network gaps/poor provision for pedestrians and cyclists.

(h) 2018 census data indicates most trips from Shotover Country and Lake Hayes Estate are to Frankton and Queenstown (circa 5km and 12km distance).

(i) There are very few transport demand management and travel behaviour change measures in place.

Key transport policy and strategy documents

22 The Transport Strategy was informed by a number of Central Government and Waka Kotahi NZ Transport Agency (**Waka Kotahi**) transport policy documents. The key drivers and themes from these documents incorporated into the TPLM Masterplan included:

(a) Shaping Urban Form – encouraging good quality, compact, mixed use urban development will result in densities that can support frequent public transport, shorter trips between home and work/education/leisure and safe, healthy and attractive urban environments to encourage more walking and cycling.

(b) Making shared and active modes more attractive – improving the quality of public transport and facilities for walking and cycling will enable people to use them. This can involve optimising the existing systems (eg through reallocating space), investment in new infrastructure and services and providing better connections between modes.

(c) Influencing travel demand and transport choices – changing behaviour may also require a mix of incentives and disincentives (or 'push and pull' factors) to either discourage use of private vehicles (by making them less attractive than other options) or making people better aware of their options and incentivising them to try something new. This may include parking policies, road pricing, travel planning and education.

23 The Transport Strategy was informed by regional transport strategies including the Way to Go (**W2G**) Mode Shift Plan "Better Ways To Go" (**Mode Shift Plan**). W2G is a partnership between Waka Kotahi, Otago Regional Council (**ORC**) and QLDC and the evidence of Tony Pickard provides more background on W2G and its work programme including the Whakatipu Active Travel Network, the Queenstown and Frankton masterplans / programme level integrated transport business cases, the Queenstown Transport Business Case, the Queenstown NZUP package of works, Public Transport Interchanges, interim improvements to Public Transport Hubs in Frankton and Queenstown, Arthurs Point Crossing (a new two-lane vehicle bridge) and various travel behaviour change initiatives.

24 The Mode Shift Plan encompasses the following three key action areas: shaping urban form; improving infrastructure and services; and influencing people's travel choices. On SH6 Ladies Mile, the Mode Shift Plan states that a strong public transport emphasis is the preferred approach to accommodating future traffic growth as opposed to providing new road infrastructure.

25 The Transport Strategy was informed by various QLDC transport policies and strategies including:

(a) Housing Infrastructure Fund (**HIF**) Integrated Transport Assessment which supported a HIF business case for 1,100 residential units at Ladies Mile.

(b) Queenstown Lakes Spatial Plan "Grow Well Whaiora" (**Spatial Plan**) which identified Ladies Mile as a Priority Development Area as a new transit-oriented neighbourhood offering new housing choices where public transport walking and cycling will be everyone's first travel choice.

(c) Queenstown Transport Business Case which included the New Zealand Upgrade Programme (**NZUP**) works at the SH6/Howards Drive roundabout and SH6 westbound bus lane, enhanced public transport fleet and services and Travel Behaviour Change and Travel Demand Management measures to encourage people to use more sustainable and higher capacity forms of transport.

(d) Wakatipu Active Travel Network Single Stage Business Case which identified walking and cycling routes to be improved or provided adjacent to TPLM.

26 In October 2020, Waka Kotahi issued a Ladies Mile Position Statement which stated that the overall alternative mode share (including public transport, walking and cycling, ride sharing and working from home) across the network will need to be in the order of 40% by 2028 to maintain a functional transport network. Waka Kotahi confirmed that 1,100 residential units could be built at Ladies Mile subject to provision of certain infrastructure and, by the time of the 1,100th unit being occupied the site would need to have a 29% reduction in private vehicle trips.

27 Subsequent to the preparation of the Transport Strategy, several new national policies and strategies have been issued such as the Emissions Reduction Plan (which includes a 20% target to reduce vehicle km travelled (**VKT**) by 2035) and the National Policy Statement on Urban Development which supports the shift of mode from private vehicle to public transport and active modes. ORC have also commenced work on the Queenstown Public Transport Detailed Business Case (**PTDBC**). At the time of preparing this evidence, work was ongoing on the PTDBC and therefore was not available to be included in my evidence

TPLM Masterplan transport strategy vision and mode shift targets

28 The overall vision for the Transport Strategy is to create an accessible, healthy, safe and sustainable TPLM community by reducing reliance on car use, by providing a well-connected street network to local community facilities and invest in active (I define these as walking and cycling) and public transport modes so that walking, cycling and bus use are everyone's first travel choice.

29 TPLM Masterplan is shown in **Appendix A** and provides a high density, mixed use, transit orientated development where walking, cycling and using the bus are the first choice/go-to modes of transport. The TPLM Masterplan also provides walk, cycle and bus connections for the adjacent residents at Shotover Country and Lake Hayes Estate to access the schools, Local Centre, Community Hub, Sports Hub and community facilities to be provided within TPLM.

30 Mode shift targets within various Waka Kotahi, ORC and QLDC approved transport strategy documents (eg Waka Kotahi Ladies Mile Position Statement, W2G Mode Shift Plan, QLDC Spatial Plan and W2G Queenstown Transport Business Case) indicated that 40% of trips by 2028 and 60% by 2048 need to be by public transport, walking, cycling and ride sharing to maintain a functional transport network.

31 Specifically for Ladies Mile, the HIF bid Integrated Transport Assessment indicated that a 50% mode shift from Ladies Mile with 2,185 residential units would be required to reduce demand on the Shotover bridge.

32 Based on the above, a mode share target of up to 50% of the external trips from TPLM Masterplan was derived. Furthermore, the Transport Strategy outlined the opportunity for mode shift from Shotover Country and Lake Hayes Estate with the provision of community facilities within easy walk, cycle and bus distance at TPLM, thus avoiding the need for these residents to drive across the Shotover Bridge to access these facilities.

33 As demonstrated in the Transport Strategy at least 40 to 60 dwellings/Ha are needed to support a viable public transport network and hence deliver mode choice. International research indicates that at 40 units/Ha, there is a 20% reduction in vehicle trips compared to 20 units/Ha and at 60 units/Ha there is a 33% reduction compared to 20 units Ha. Therefore, I consider that the medium and high density proposed within TPLM Variation is required in order to support a viable public transport network and deliver mode choice for residents and visitors.

Transport Strategy interventions

34 Section 5 of the Transport Strategy provides details of the proposed TPLM Masterplan transport interventions which are included in the TPLM Variation provisions and these are summarised below:

(a) Internal street cross sections - these provide a safe, healthy and attractive urban environment to promote walking and cycling within the TPLM internal streets through by example the provision of wide footpath widths, segregated cycleways and a low speed environment.

(b) SH6 cross sections - these provide a safe, healthy and attractive urban environment to promote walking, cycling and bus use on SH6 by for example a reduction in the SH6 posted speed limit to 60 km/h and at grade signalised crossings for pedestrian and cyclists.

(c) Bus strategy - the preferred TPLM Variation bus routing is on SH6 with high quality bus stops to be provided enabling the majority of the TPLM Variation area to be within 500m of a bus stop. Increased frequency of services is proposed along with bus priorities on SH6 and a potential new bus (and pedestrian/cycle) only link from SH6 to Sylvan Street in the Lake Hayes Estate (noting as set out in Mr Pickard's evidence that the Sylvan Street link would be subject to a submission of a business case). As indicated in the Transport Strategy, the internal collector roads will be designed to accommodate bus use should, in the future, buses route on these roads.

(d) Car Parking – maximum on site car parking rates are proposed for residential, offices and retail uses. Limited on street parking will be provided for visitors, car share and deliveries/servicing and this will be provided at a much lower level than that required within the QLDC Code of Practice.

(e) Cycle parking and end of trip facilities (eg lockers and showers) - minimum cycle parking and end of trip facilities are proposed.

(f) Vehicular access - this would be provided via the NZUP proposed SH6/Howards Drive roundabout, a new roundabout at Lower Shotover Road/Spence Road and a new roundabout to the east of the existing #516 Ladies Mile driveway.

(g) Walking and cycling improvements - in addition to the improvements for active modes within the TPLM Masterplan area and on and across SH6 as outlined above, implementation of the W2G Whakatipu Active Travel Network improvements will enhance walking and cycling connections to the surrounding area. The evidence of Mr Pickard provides more details of the W2G proposals.

(h) Travel Behaviour Change/Travel Demand Management initiatives – the Transport Strategy identified the need for complementary

Travel Behaviour Change measures to be progressed alongside development of TPLM covering both TPLM and Shotover County and Lake Hayes Estate including comprehensive parking management plans, wayfinding, community, residential, school and workplace Travel Plans, Transport Management Associations, ebike public bike share, car share and car-pooling schemes. Some of these Travel Behaviour Change initiatives and how these will be delivered by QLDC are discussed in the evidence of Mr Pickard.

Implementation

35 Based on the transport interventions summarised above, the Transport Strategy identified an Action Plan which highlights the sequencing of the proposed transport interventions for each of the development sub areas. The action plan is included as **Appendix B**. Delivery of each transport intervention is based on:

(a) W2G partners proposed implementation dates (where known); or

(b) First occupation of a development sub area; or

(c) Dependency on delivery of another transport intervention; or

(d) Ongoing as the TPLM Masterplan is delivered.

36 As such, the delivery of the transport interventions is not based on a trigger for an assumed quantity of development, but rather based on what transport intervention is needed to support the delivery of development in a particular sub area in order to achieve the required mode shift.

37 The Action Plan indicates the transport intervention, its time frame/dependency, along with who is responsible for implementing the intervention.

Transport Strategy impact on surrounding road network

38 To assess the impact on the surrounding road network, transport modelling work was commissioned using the Queenstown strategic transport model and public transport model, which are models used by the W2G partners to assess the impact of land use developments and used to support various transport business cases within Queenstown. The scope of the work was agreed with the W2G partners and involved

modelling two scenarios of 1800 units (Option 1) and 2,400 units (option 2) compared to the 2048 base model. The 2,400 units was an upper level of units which, at that time in the development of the TPLM Masterplan, was considered to be deliverable. It was for this reason why this number of units was modelled. The option with 1,800 units was considered to be a suitable number of units to model since this was considered to be in between the HIF 1100 units and the upper level of 2,400 units being considered in the TPLM Masterplan at that time.

39 The outputs from the modelling indicated that on Shotover Bridge in the AM peak westbound there was a small increase in flows when compared to the base model of 69 vehicles with the 2,400 units (a 4% increase). Both the base year model and option 2 with 2,400 units resulted in traffic flows on the bridge being marginally above the Waka Kotahi calculated capacity of 1,700 vehicles/lane. In the PM peak eastbound there was a small increase in flows when compared to the base model of 98 vehicles with the 2,400 units (a 6% increase). Option 2 with 2,400 units resulted in traffic flows on the bridge being marginally above the Waka Kotahi calculated capacity of 1,700 vehicles/lane. It should be noted that this is the effect at maximum development capacity and the zone will develop over time with effects initially being lower.

40 When compared to the Base model, the modelling did not identify any issues as a result of the 2,400 units on the bridge eastbound in the AM peak, westbound in the PM peak or in the Inter Peak in both directions.

41 For the rest of the Queenstown road network, the modelling indicated only marginal changes with 2,400 units when compared to the Base model.

42 As detailed in the Transport Strategy, due to limitations of the available transport models to assess the impacts (of for example active modes and Transport Demand Management measures), further manual adjustments were made to the modelling.

Transport Strategy Summary

43 In my opinion, in accordance with national, regional and local transport strategies and initiatives, the proposed transport interventions identified in the Transport Strategy, when implemented, will deliver the required mode choice for TPLM residents and visitors to contribute to maintaining a functional transport network.

44 Furthermore, by facilitating a mode shift from the adjacent communities of Shotover Country and Lake Hayes Estate, this will further assist with achieving wider Queenstown transport network mode shift targets.

45 Overall, based on the modelling work carried out within the Transport Strategy, I consider that the TPLM Variation will not give rise to adverse effects on the adjacent and wider road network, and can be appropriately mitigated as development at the TPLM Variation Site progresses.

Updates to the Transport Strategy

Transport Strategy impact on surrounding road network

46 Following discussions in July 2023 with Waka Kotahi and QLDC, I was made aware that the QLDC/Waka Kotahi Strategic Transport Model had recently been updated and that there had been recent updates to the ORC Public Transport Model. Waka Kotahi also indicated that more recent travel time and traffic count data was available. Waka Kotahi stated that many of the comments and queries raised in their submission (submitter # 104) would be addressed through use of the updated Transport Models and survey information.

47 The Draft Technical memo attached in **Appendix C**, provides details of the additional Strategic and Public Transport Modelling work undertaken and my analysis of the results. The Draft Technical Memo also provides a review and analysis of the 2023 survey data. In the timescales available from receiving the modelling data and presenting the results in my evidence, it has not been possible to discuss the findings with Waka Kotahi. It is the intention that the results from this modelling are discussed and agreed with Waka Kotahi and the Technical Memo will be updated and reissued accordingly prior to expert conferencing.

48 Based on the results from the previous modelling work, only one TPLM option of 2,400 units was modelled with the updated Strategic and Public Transport Models, since the results from the earlier modelling indicated that this level of development could be accommodated within the surrounding transport network.

49 The findings from this updated assessment work are summarised below:

SH6 traffic volumes between 2018 to 2023

50 Based on Waka Kotahi permanent counter sites on SH6 adjacent to Ladies Mile for the period 2018 to 2023 (part of) the following is concluded. Post Covid traffic volumes on SH6 in 2022 have largely returned to 2018 pre Covid levels and the partial data for 2023 indicates flows are approximately 6% higher. As such, reference to 2018 data in the TPLM Transport Strategy report is considered to be a reliable indicator of present-day traffic flows.

Updated queue length data

51 Based on June 2023 QLDC Bluetooth journey time data, the following is concluded:

(a) SH6 eastbound AM peak BP roundabout to Lake Hayes Road - no queues and delays.

(b) SH6 eastbound PM peak BP roundabout to Lake Hayes Road - up to 6 minutes delay, with 5 of these minutes on the section BP roundabout to Hawthorne Drive.

(c) SH6 westbound AM peak Lake Hayes Road to BP roundabout, delays between Howards Drive and Stalker Road of up to 5 minutes and between Stalker Road and Hawthorne Drive (across the bridge) of up to 3 minutes.

(d) The QLDC June 2023 Bluetooth data confirms the findings from the queue surveys reported in the Transport Strategy.

Bus Journey time data

52 Based on June 2023 ORC bus journey time data, the following is concluded:

(a) From Tucker Beach Road (just west of the bridge) to Jones Avenue AM peak - no queues and delays.

(b) From Tucker Beach Road (just west of the bridge) to Jones Avenue PM peak - up to 4 minutes delay.

(c) From Jones Avenue to Tuckers Beach Road AM peak – up to 6 minutes journey time delay for buses northbound on Stalker Road.

(d) From Jones Avenue to Tuckers Beach Road PM peak- no queues and delays.

(e) The ORC June 2023 bus journey time data confirms shorter queues and delays from the queue surveys reported in the Transport Strategy.

Updated Transport Modelling

53 Based on the updated Queenstown Strategic Modelling and Public Transport modelling the following is concluded:

(a) Comparison of 2053 with and without TPLM predicted flows (post Public Transport modelling). The results indicate that the Shotover Bridge will be operating within capacity for the AM peak, Inter peak (**IP**) and PM peak for the 2053 base year both with and without TPLM. The exception is the PM peak eastbound with TPLM, which will be very marginally above capacity (only by 10 vehicles). Therefore, it is considered that the 2053 base model predictions (both with and without TPLM) indicate that there would not be any link capacity issues with TPLM and the proposed public transport measures on the surrounding transport network.

(b) Comparison of flows of 2053 with and without TPLM predicted flows (pre Public Transport modelling). The results indicate that without TPLM the Shotover Bridge eastbound will be over capacity in the PM peak. With TPLM, the Shotover Bridge will be over capacity in the AM peak westbound and in the PM peak eastbound. Therefore, it is considered that the 2053 base model predictions (both with and without TPLM) demonstrate the need for public transport investment to achieve mode shift and an operational transport network as set out by the W2G partners and as set out in the TPLM Masterplan and Variation.

(c) In terms of the distribution of TPLM trips, the Queenstown Transport Strategic and Public Transport models predict a large number (27% to 38%) of all TPLM trips to remain internal to the site. Key destinations for external trips include the adjacent Basin areas, Frankton and Queenstown CBD. For the external trips the models predict a 24% to 49% public transport modal share.

(d) The models are based on a predicted AM and PM peak bus mode share of between 21% to 22%. For the reasons outlined in the Transport Strategy, this is considered to be an underestimate of

the expected non car mode share at TPLM since it does not take into account mode shift arising for example, from the proposed TPLM Variation and W2G partners active mode, Travel Behaviour Change or Transport Demand Measures. It is therefore considered that the model is showing a worst case assessment and I consider for the reasons detailed in the Transport Strategy that it will actually be a much higher public transport mode share. However, the model indicates that even with this lower PT mode share, that there will be limited capacity issues on the adjacent road network.

(e) The models predict AM and PM peak bus mode share of between 18% to 19% at Lake Hayes Estate/Shotover Country. This is a substantially greater bus mode share than currently exists at Lake Hayes Estate and Shotover Country. The model demonstrates that with public transport investment by W2G partners and with the TPLM Variation, mode shift can be achieved at Lake Hayes Estate and Shotover Country.

(f) The models predict AM and PM peak bus mode share of 20% to 21% across the Shotover Bridge. This is a substantially greater bus mode share than currently exists across the Shotover Bridge. The model demonstrates that with public transport investment by W2G partners and with the TPLM Variation, mode shift can be achieved across the Shotover bridge with the model predicting that the bridge will work at capacity at 2053 with TPLM and with public transport investment. It should also be noted that the 2053 base model plus TPLM predicted bus trips are very close to the targets set within the ORC PTDBC set out in Section 6 above of 772/869 bus passengers on Shotover bridge for the bridge to operate at 90% volume/capacity ratio for general traffic.

(g) As noted by the consultants operating the models, the modelling suite is a fixed demand matrix, so there is no (or little) account of any temporal effects such as peak spreading and trip suppression; or any behavioural effects such as trip chaining due to congestion. Therefore, the overall demand is considered worst case in the peak hour periods.

Sidra capacity assessments of SH6/Stalker Road and SH6/Howards Drive (NZUP) roundabouts

54 Based on Sidra capacity assessments carried out using existing traffic flows and the 2053 transport model flows the following is concluded:

(a) With adjustments applied to the Sidra models (to account for the existing AM peak queues from Shotover bridge to east of Howards Drive), both roundabouts are predicted to operate above capacity in the AM peak with existing traffic flows.

(b) In the PM peak with existing traffic flows, both roundabouts are predicted to operate within capacity.

(c) For the 2053 Base with TPLM (post Public Transport modelling), at the existing SH6/Stalker Road roundabout in the AM peak the Sidra model predicts long queues and delays on Stalker Road. In the PM peak the roundabout will operate within capacity. As identified in the Transport Strategy, the preference would be to introduce traffic signal control at this intersection to improve operational performance and introduce controlled crossings for pedestrians and cyclists.

(d) For the 2053 Base with TPLM (post PT modelling), at the NZUP SH6/Howards Drive roundabout in both the AM and PM peaks the Sidra model predicts the NZUP roundabout will operate within capacity. As identified in the Transport Strategy, the preference though would be to introduce traffic signal control at this intersection to introduce controlled crossings for pedestrians and cyclists.

Summary of updated Transport Modelling

55 Overall, based on the additional modelling work carried out subsequent to the Transport Strategy, I consider that the TPLM Variation will not give rise to adverse effects on the adjacent and wider road network, and can be appropriately mitigated as development at the TPLM Variation Site progresses.

Transport Related TPLM Variation provisions

56 I was involved in drafting the TPLM Variation provisions to ensure that the Transport Strategy objectives and transport interventions will be

delivered. All of the Transport Strategy interventions discussed previously in my evidence (with the exception of the Travel Behaviour Change initiatives and the wider W2G Active Mode interventions which will be delivered through separate workstreams as detailed in Mr Pickard's evidence) have been incorporated into the TPLM Variation provisions.

57 The TPLM Variation rules are based on the transport upgrades being provided prior to development in order to provide the necessary access to and within the sub areas by walking, cycling, bus and private vehicles from the outset of development and thus provide residents and visitors with viable transport choices from day one of occupation.

58 Commentary on specific transport related provisions are discussed in the paragraphs below.

59 In terms of the chapter 49 objectives, transport is integrated across most of these, but specifically Objective 49.2.6 is focussed on minimising the generation of additional vehicle trips on SH6. This is achieved through providing high density development, a range of activities and the transport interventions highlighted in the Transport Strategy and summarised previously in my evidence.

60 Similarly, transport is integrated across many of the Chapter 49 TPLM plan provisions rules including:

(a) Rule 49.4 (Activities) - I consider that this addresses key transport considerations including provision of safe and efficient access, street, footpath, cycleway, servicing and parking layouts.

(b) Rule 49.5 (Standards) – In my opinion this addresses staging of development in all of the sub areas until completion of the transport interventions, as set out in the Transport Strategy.

(c) Rule 49.7 (Assessment matters for site and building design) - I consider that this addresses the need for development to safely integrate with people with accessibility requirements, people walking and cycling and also to comply with Crime Prevention Through Environmental Design (CPTED) principles.

61 Likewise, I consider that transport is integrated across most of the proposed changes to the following District Plan chapters:

(a) Chapter 4 (Urban Development) through reference to reduced reliance on travel by private vehicles through promotion of public and active transport.

(b) Chapter 27 (Subdivision and Development) through reference to bringing about a significant modal shift away from reliance on the private car to enhanced use of public and active transport. The amendment also includes a policy relating to providing a safe and efficient transport network through implementation of the transport interventions identified in the Transport Strategy.

(c) Chapter 29 (Transport) through reference to the Transport Strategy maximum car parking standards and minimum bike parking and end of trip facilities. This is further supplemented in the TPLM Variation provisions by rules relating to safe and efficient location of driveways, intersection spacing and location of car and cycle parking.

Summary of transport related TPLM Variation provisions

62 I am of the opinion that the transport related TPLM Variation provisions summarised above were informed by the Transport Strategy and will enable delivery of an integrated urban environment, support key Kāi Tahu values, promote reduction in reliance on private vehicle trips and provide a safe and efficient transport network.

Response to submissions

63 I have read and considered the submissions that relate to transport matters. Across the submissions, a number of similar transport themes were identified. To avoid repetition, I have provided my response to submissions in relation to themes raised (and subsequent sub themes) and identifying submitters that the response applies to. In my discussion I indicate whether I agree or disagree with the various submissions, my reasons, and comment on the implications if any for the TPLM Variation.

Waka Kotahi

64 Waka Kotahi (submission 104) indicates that Waka Kotahi is supportive of the TPLM Variation in principle and acknowledge that Waka Kotahi has been involved in the development of the TPLM Masterplan and Plan Variation through the Project Working Group (**PWG**) and the Project

Control Group (**PCG**). The submission sets out the following six areas where relief is sought:

(a) Specific amendments to the TPLM Variations (attachment 2 of Waka Kotahi's submission) – having reviewed these specific amendments, from a transport perspective I would agree with the proposed changes.

(b) Amendments to modelling - as discussed and agreed with Waka Kotahi, additional transport modelling has been carried out, as reported in previously in my evidence.

(c) Core waste water and water supply - this is addressed in the evidence of Amy Prestidge.

(d) Improvements to staging rules for transport infrastructure. The TPLM Variation has been updated to include provision of the SH6 bus lanes which will be required to provide improved bus journey times and reliability and to give a journey time advantage over use of private vehicles to encourage use of public transport by residents and visitors.

(e) On street parking – very limited on street parking will be provided for visitors, car share and deliveries/servicing and the TPLM Masterplan indicates that this will be provided at a much lower level than that required within the QLDC Code of Practice. As detailed in Mr Pickard's evidence, QLDC intend to re visit all aspects of their current parking approach, including revisions to the Subdivision Code Of Practice in order that on-street parking will practically disappear or be significantly reduced.

(f) Capacity assessments of the SH6 intersections with Stalker Road and Howards Drive are required - as discussed and agreed with Waka Kotahi, additional transport modelling has been carried out as reported previously in my evidence.

Sub areas H1, H2 and I

65 Several submissions[1] seek to remove the density limit from Sub Area H2, or alternatively that the maximum residential standard is 350m^2 per

[1] Caithness Developments Ltd (submitter 45), Shotover Country Limited (submitter 46), Koko Ridge Limited (submitter 80), Tim Allan (submitter 103).

residential unit or the Koko Ridge Limited Land is zoned as PDP Low Density Suburban Residential zoning, the same as the Queenstown Country Club land. These submitters also seek to amend the provisions to enable development in the H1, H2 and I precincts to occur independently of pedestrian infrastructure and independently of development in the north side of SH6. They also state that H1 is conditional within TPLM Variation *on provision of a pedestrian overpass.*

66 I would not agree with removing the density limit since this sub area is a long distance from the TPLM community facilities and also from bus stops and hence increasing the number of units further away from these facilities will increase private vehicle use. However, given the long distance from bus stops I would agree that section 49.5.10 of the TPLM Variation provisions can be amended so that H1 and H2 and I are not required to provide the bus stops on SH6 west of Stalker Road and the pedestrian connections to these on the north side of SH6. The pedestrian link on the south side of SH6 within H1 ownership will be required to be provided to ensure that delivery of this is not prevented in the future. It should be noted that the TPLM Variation does not make H1 conditional on a pedestrian overpass.

67 I also do not agree that it is appropriate to rezone subareas H1 and H2 as PDP LDSR zoning. If these areas were zoned LDSR, they would not be subject to the TPLM Variation provisions that require delivery of the transport interventions before development occurs. As stated previously in my evidence, transport intervention is needed to support the delivery of development in a particular sub area in order to achieve the required mode shift.

Residential flats within the LDR Precinct

68 Several submissions[2] seek changes to allow residential flats within the LDR Precinct. Where residential flats are proposed in the LDR, then as long as these are included in the overall number of bedrooms for the unit that the flat is associated with, then the maximum car parking standard will apply to both the combined unit and residential flat number of bedrooms. On this basis I do not consider there to be a transport impact.

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[2] Caithness Developments Ltd (submitter 45), Shotover Country Limited (submitter 46), Koko Ridge Limited (submitter 80).

Appropriateness of other locations for urban development

69 As detailed in Section 11 of the s42 report, several submissions[3] consider that other locations should be prioritised for growth ahead of Ladies Mile. In addition to the responses to these submissions provided within Section 11 of the s42 report, I provide additional transport commentary as follows:

Trustees of the Anna Hutchison Family Trust (submission 107)

70 The Trustees of the Anna Hutchison Family Trust (submission 107) request that the TPLM zone is extended to the west to include Low Density Residential (**LDR**) and Medium Density Residential (**MDR**) precincts. From a transport perspective I would not agree with this extension since:

(a) This land would be much further away from the proposed local centre, high school and sports hub, thus reducing the attractiveness to walk or cycle to these facilities.

(b) The site would also be more than 800m from the nearest TPLM Variation bus stops, which is not considered an easy walk distance to use public transport. Re-routing the bus services into the site would increase the bus journey time for passengers and thus make the route unattractive.

(c) Appendix 9 of the submission has an annotated masterplan that indicates an active travel link across SH6. At the location shown, there are steep embankments on either side of SH6 and it is unclear how a safe active mode crossing can be provided at this location.

(d) Medium and high density development is required to sustain a public transport service and therefore the addition of LDR could undermine the TPLM Transport Strategy and overall transport impact and is likely to increase vehicular use.

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[3] Threepwood Farm Residents Association & Threepwood Custodians (submitter 33), Peter Chudleigh (submitter 35), Jo and Matt Dobb (submitter 37), Friends of Lake Hayes Society Incorporated (submitter 39), Shane Pratley (submitter 41), Bill Yuill (submitter 42), Miranda Spary (submitter 43), the Trustees of the Anna Hutchinson Family Trust (submitter 107), Martin Barrett (submitter 118).

Existing transport infrastructure overwhelmed/congestion

71 Submissions relating to the theme of existing transport infrastructure being overwhelmed were made within a large number of submissions[4]. The issues raised are discussed in the following paragraphs, in the format of a summary of the submitters comment in italics and my response following this:

There is insufficient transport infrastructure to accommodate 2,400 units

72 I do not disagree that there is currently peak period congestion on SH6 adjacent to TPLM. However, the intention with the TPLM Variation is to provide high density residential development with key community facilities located within a short walking distance to enable a mode choice from private car to public and active transport modes and to provide investment in these modes. The TPLM Variation provisions align with the W2G partners transport strategies and proposed investment in the surrounding transport network which will be targeted to enabling a mode shift from car to public and active transport modes.

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4 Jake Allen (submitter 1), Ursula Davis (submitter 2), Gretchen Mark-Dear (submitter 3), Graeme Dear (submitter 4), Rick Petit (submitter 5), Tim Sanders (submitter 6), Jay Berriman (submitter 9), Mark Camilleri (submitter 10), Ian Moore (submitter 11), Jonathon Newson (submitter 13), Blair Findlay (submitter 14), Vladimir Noskov (submitter 16), Nathan Brown (submitter 17), Katie Hill (submitter 19), Samuel Belk (submitter 20), Nicole Fairweather (submitter 21), Allan Meredith (submitter 22), Nadie Lisitsina (submitter 23), Jennifer James (submitter 25), Kate Pirovano (submitter 26), Jim and Deirdre Robinson (submitter 27), James Lazor (submitter 28), Hamish MacPherson (submitter 29), Geraldine McBride (submitter 31), Lois Martin (submitter 32), Threepwood Farm Residents & the Threepwood Custodians Limited (submitter 33), Peter Chudleigh (submitter 35), Julie Johnston (submitter 38), Shane Pratley (submitter 41), Bill Yuil (submitter 42), Robert Burnell (submitter 47), Lloyd and Debbie Anderson (submitter 48), Nicky Busst (submitter 49), Kim Netlzer (submitter 50), Gary Erving (submitter 51), Gillian Clair Egerton (submitter 52), Peter Thompson (submitter 53), Sam and Kylie Strain (submitter 54), Neil McDonald & Clark Fortune Associates Ltd (submitter 55), AA Southern Lakes (submitter 56), Robert Cranfield (submitter 58), Leon Prytherch (submitter 59), Margo Pryde (submitter 60), Sherry Thornburg (submitter 63), Wayne Stiven (submitter 65), Ross George (submitter 66), Sarah and Blair O'Donnell (submitter 67), Nick Winstone (submitter 68), John Alexander (submitter 70), Anthony Stack-Forsyth (submitter 72), Blakely Wallace Family (submitter 74), Park Ridge Limited (submitter 75), Maree Wheeler (submitter 76), Ladies Mile Pet Lodge Limited (submitter 78), Lake Hayes Estate Community Association (submitter 79), Melissa Read (submitter 87), Dennis Behan (submitter 90), Andrew Morris (submitter 91), Stephen Brent and Sheena Haywood (submitter 92), Ferry Hill Trust (submitter 96), Philippa Crick (submitter 97), Louise McQuillan (submitter 98), Tim Allan (submitter 103), Robyn Macleod (submitter 109), Travis Sydney (submitter 110), Ralph Hanan (submitter 111), Janie Reese and Rob Lee (submitter 112), Debbie Bergin (submitter 113), Kirsty and Justin Crane (submitter 115), Maryann Bailey (submitter 116), Nicky Martin (submitter 117), Martin Barrett (submitter 118), Jane Hamilton (submitter 119), Rebecca Richwhite and Daniel Foggo (submitter 121), Mitzi Cole-Bailey (submitter 122), Rosemary Lee Crick (submitter 123).

73 Therefore, currently there is insufficient transport infrastructure to accommodate the 2,400 units, but going forwards in the future with a combination of the TPLM Variation provisions, including the residential densities required by the provisions and the change in emphasis of W2G partners transport investment to encourage a mode shift from car to public and active transport modes, then I consider there will be sufficient transport infrastructure to accommodate the TPLM Variation. It should be noted that this is the effect at maximum development capacity and the zone will develop over time with effects initially being lower. It should also be noted that the peak period problems are westbound in the AM peak and eastbound in the PM peak and only during school term time. For all other time periods and traffic flow directions there are no congested areas adjacent to Ladies Mile.

The Shotover Bridge, BP roundabout and surrounding network area already at capacity at peak times for both public transport and private vehicles and the additional residents will cause overcrowding of already congested Ladies Mile highway, making it difficult for residents to commute and drive around safely

74 As discussed previously in my evidence I would agree with this comment noting that going forwards in the future with the change in emphasis of transport investment to encourage a mode shift from car to public and active transport modes, then I consider there will be sufficient transport infrastructure to accommodate the TPLM Variation. The comment that the network is already at capacity at peak times for public transport clearly demonstrates this point. Currently buses have no priorities on SH6 or SH6A and, as such, bus passengers are in the same peak period queues as car drivers. However, with a change in emphasis of transport infrastructure aimed at providing bus priority, then bus journey times will become quicker than by car, bus reliability will improve and, as a result, mode shift will be expected (as evidenced elsewhere in NZ and internationally) since there will be an advantage in using a bus compared to driving a car. Waka Kotahi's NZUP proposals include for westbound bus lanes and the TPLM Variation includes for westbound bus lanes to be provided before development in sub areas commences. Furthermore, as reported in the Transport Strategy (and confirmed in Submitters responses), the peak period queuing does not occur during school holidays. With the provision of a high school at TPLM, a large amount of car trips associated with school travel will be reduced and

replaced with shorter distance walk and cycle trips to the TPLM proposed high school.

Seek no development until there is a further two-lane bridge across Shotover River or another separate bridge and widening Shotover bridge is more effective than bus lanes

75 The W2G partners Queenstown Integrated Transport Programme Business Case rejected an option involving providing a new or widened bridge across the Shotover River since it was considered that it does not address the wider network capacity constraints. As made clear in the W2G partners transport strategies and Mr Pickard's evidence, transport investment in the surrounding transport network will be focussed on public and active transport modes to enable mode shift from private vehicle/car. I consider that the transport interventions contained in the Transport Strategy and TPLM Variation provisions support the W2G partners investment approach.

Various suggestions of alternative transport modes including a tramline, gondola, monorail, cable car to connect to Frankton Bus Hub, an electric train that links to town and mass rapid transit

76 I am aware that some alternative forms of transport have been considered previously by the W2G partners and I understand these were rejected options within the Queenstown Integrated Transport Programme Business Case. This is why they were not considered further within the Transport Strategy.

Will have adverse effects on access to Queenstown CBD

77 Based on the current reliance on the car as the main form of transport, it is my opinion that congestion will only continue to increase in the future and the provision of more road capacity will only compound congestion. This is not sustainable going forwards and hence the reason why the W2G partners transport strategies are focussed on investment to achieve mode shift from car to public and active transport modes rather than perpetuating the problems arising from car oriented infrastructure, as detailed in Mr Pickard's evidence. The TPLM Variation provisions complement this by providing high density residential development within walking distance of key community facilities as well as focussing investment on public transport and active modes in order to move more

people by less vehicles. Therefore, I do not consider that there will be adverse effects on people being able to access Queenstown CBD.

Proposal should align with current transport infrastructure and commuter behaviour

78 The current transport infrastructure, and hence commuter behaviour, is car orientated and commuter behaviour is therefore dependent on the car. As detailed in the Transport Strategy and Mr Pickard's evidence, national and local planning and transport policies and strategies and the transport investment strategies of the W2G partners, is focussed on public and active transport modes rather than perpetuating the problems arising from car oriented infrastructure. Continuing investment in car orientated infrastructure is not sustainable for the continued growth in the region. I do not consider it is appropriate that the TPLM Variation provisions align with the current road based transport infrastructure or the current car dominated commuter behaviour.

Suggestion of building new roads including, a southern bypass of Queenstown and dual carriageway of SH6 at Kawarau Gorge

79 I am not aware of any Waka Kotahi or QLDC plans for a southern bypass road nor dualling of SH6 at Kawarau Gorge. As made clear in the W2G partners transport strategies and Mr Pickard's evidence, transport investment in the surrounding transport network will be focussed on public and active transport modes to enable mode shift from car. I consider that the transport interventions contained in the Transport Strategy and the TPLM Variation provisions support the W2G partners investment approach.

Some congestion would be alleviated if the existing council land on the south side of the SH was utilised for a new high school and other community facilities, reducing the need for vehicles to travel to Frankton for these reasons

80 I would agree with this comment and the TPLM Variation includes provision of a new high school and community facilities which will reduce the need for vehicles to travel to Frankton.

No further density of development east of Shotover Bridge should be granted

81 Several submissions including the submission of the Lakes Hayes Estate Shotover Community Association (**LHSCC**) (submission 79) refer to a May 2018 Statement of Evidence prepared by David Smithon behalf

of QLDC that considered traffic and transportation effects that would likely to occur if submissions requesting the rezoning of land within the Wakatipu Basin as part of Stage 2 of the Proposed District Plan (**PDP**) review hearings were to be approved. Mr Smith's evidence concluded that the approval of any submissions that propose to increase density in the Wakatipu Basin will exacerbate congestion at SH6 Shotover Bridge. On that basis, Mr Smith concluded that without appropriate mitigation being sought to address effects along SH6 including the Shotover Bridge, he opposed all submissions that seek to increase residential density beyond that provided for in the notified Wakatipu Basin Chapter.

82 I understand that Mr Smith's 2018 evidence was part of Stage 2 of the PDP review and in particular Stream 14 where QLDC was considering the rezoning requests within the Wakatipu Basin. I am not aware that there was any supporting comprehensive Transport Strategy for Mr Smith's evidence, as is the case for TPLM Variation.

83 Furthermore, there have been many changes in the transportation environment within Queenstown since Mr Smith's May 2018 evidence including:

(a) The formation of the W2G partnership in November 2018.

(b) Queenstown NZUP announcement.

(c) Multiple W2G strategies and business cases that emphasise mode shift.

(d) Various new Government strategies for instance the Emissions Reduction Plan (which includes a 20% target to reduce vehicle km travelled by 2035) and the National Policy Statement on Urban Development which supports the shift of mode from private vehicle to public transport and active modes.

(e) Updated Queenstown Strategic and Public Transport Models.

(f) Commencement of the ORC PTDBC.

84 Therefore, investment strategies and priorities have greatly changed subsequent to Mr Smith's May 2018 evidence. Furthermore, the TPLM Variation sets out various transport interventions that need to be in place before development takes place in order to mitigate the effects of development at TPLM.

85 For all of the above reasons I do not consider it appropriate to compare the TPLM Variation with Mr Smith's May 2018 evidence.

Road Safety

86 Submissions relating to the theme of road safety were made within numerous submissions[5]The issues raised are discussed in the following paragraphs, in the format of a summary of the submitters comment in italics and my response following this:

The risk of accidents on the Ladies Mile will be increased with large slow moving traffic and trades coming and going on a State Highway and the entrance to the district

87 The proposed transport interventions identified within the TPLM Variation provisions will be designed in accordance with Waka Kotahi Safe System principles and, as such, I do not consider will result in unsafe solutions.

Inappropriate to rezone Koko Ridge to medium density (only one road in and out and increase danger to Stalker Road)

88 The TPLM Variation proposes this area will provide for less than 100 new residential units. These will be accessed from the existing Kahiwi Drive/Stalker Road intersection and I consider this to be a safe access solution for this level of development.

Emergency services will not be able to get through

89 I am not aware of any issues raised by the emergency services in terms of existing access to properties on Ladies Mile. It is my opinion that the TPLM Variation will not make conditions any worse for emergency services to access properties at Ladies Mile and I am aware that Fire and Emergency New Zealand (**FENZ**) have made recommendations in their submission to wording of the TPLM Variation provisions. I understand FENZ's submission and the requested amendments have been addressed in the s42A report and in Stuart Dun's evidence.

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5 Tim Sanders (submitter 6), Jay Berriman (submitter 9), Vladimir Noskov (submitter 16), Hamish MacPherson (submitter 29), Lois Martin (submitter 32), AA Southern Lakes (submitter 56), Wayne Stiven (submitter 65), Maree Wheeler (submitter 76), Philippa Crick (submitter 97), Janie Reese and Rob Lee (submitter 112), Kirsty and Justin Crane (submitter 115), Maryann Bailey (submitter 116), Rosemary Lee Crick (submitter 123).

This increase in traffic will mean considerably longer times for Threepwood residents to safely exit McDowell Drive and for them and the wider community to travel along SH6. Increased traffic numbers and travel times will result in frustrated motorists, meaning road safety will also be compromised

90 As made clear in the W2G partners transport strategies, transport investment in the surrounding transport network will be focussed on public and active transport modes to enable mode shift from car. The transport interventions contained in the Transport Strategy and TPLM Variation provisions support the W2G partners investment approach. Therefore, it is my opinion that by moving more people by less vehicles will not necessarily result in increased vehicles. Furthermore, travel times by public transport will be vastly improved and, as such, I do not consider that road safety will be compromised.

It is not feasible to suggest that all students would use alternative transport to get to school while needing to cross a main road. An underpass would be required to ensure safety

91 The TPLM Variation provisions include for new at grade crossings on SH6 to assist pedestrians and cyclists (including school children) to cross safely. These crossings will be designed in accordance with Waka Kotahi Safe System principles and, as such, I do not consider will result in unsafe solutions and hence will support walking and cycling to school. As detailed in the TPLM Variation an underpass to cross SH6 is preferred at the SH6/Howards Drive intersection (see policy 49.2.6.4(b)).

To re zone the area adding a potential 10,000 people from a new development onto the roads is a dangerous and nigh on impossible situation

92 It is not clear how the submitter has estimated a population of 10,000 for 2,400 medium to high density units. Notwithstanding this, the transport interventions identified in the TPLM Variation provisions will be designed in accordance with Waka Kotahi Safe System principles and, as such, I do not consider will result in either a "*dangerous or nigh on impossible situation"*.

Development triggers (non-site or sub area specific)

93 Submissions relating to the theme of development triggers (non-site/sub area specific) were made within numerous submissions[6]. The issues raised are discussed in the following paragraphs, in the format of a summary of the submitters comment in italics and my response following this:

No rezoning / development until suitable infrastructure / transport congestion sorted. Hold off variation until better guarantees and triggers and safeguards in place over implementation of variation. Seek that any provision that seeks development is limited or stopped until infrastructure is complete

94 The TPLM Variation provisions (for example in paragraph 49.5) state that development within the sub areas shall not occur prior to completion of the required transport infrastructure works. I therefore consider that the proposed TPLM Variation provisions address these submission points.

TPLM Variation should contain provisions that provide for triggers that need to be met before development can occur / implementing the LMV zoning. Consideration needs to be given to seeing evidence that the mode shift targets set out in the report can actually be achieved prior to construction work beginning

95 I consider that the proposed triggers requiring transport infrastructure to be in place before development is the most appropriate form of development trigger. I do not consider that triggers requiring measurement of mode share is either practicable or enforceable.

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6 Jake Allen (submitter 1), Ursula Davis (submitter 2), Gretchen Mark-Dear (submitter 3), Shane Melton & Phylis Wong (submitter 18), Katie Hill (submitter 19), Lois Martin (submitter 32), Peter Chudleigh (submitter 35), Julie Johnston (submitter 38), Bill Yuil (submitter 42), Gary Erving (submitter 51), Neil McDonald & Clark Fortune McDonald & Associates (submitter 55), Robert Cranfield (submitter 58), Jason Smith (submitter 62), Sherry Thornburg (submitter 63), Nick Winstone (submitter 68), Blakely Wallace Family (submitter 74), Park Ridge Limited (submitter 75), Maree Wheeler (submitter 76), Melissa Read (submitter 87), Stuart Victor (submitter 89), Ferry Hill Trust (submitter 96), Tim Allan (submitter 103), Robyn Macleod (submitter 109), Ralph Hanan (submitter 111), Debbie Bergin (submitter 113), Nicky Martin (submitter 117), Martin Barrett (submitter 118).

Development triggers (site/sub area specific)

96 Submissions relating to the theme of Development triggers (site/sub area specific) were made within several submissions[7]. The issues raised are discussed in the following paragraphs, in the format of a summary of the submitters comment in italics and my response following this:

There has been inadequate consideration of alternative locations for a crossing point across SH6 and/or any necessary related Crossing Precinct overlay

97 Options for crossings of SH6 were fully considered within the Transport Strategy (see Appendix D of the Transport Strategy) and the preferred TPLM Masterplan options were discussed and agreed with Waka Kotahi and QLDC.

Oppose rules and staging that require all infrastructure in all sub areas before any of them can be developed

98 I consider that it is appropriate that the TPLM Variation provisions stage development to integrate with the provision of the infrastructure that is required for that sub area in order to provide the necessary access to and within the sub areas by walking, cycling, bus and private vehicles from the outset of development so that the development can benefit from the transport initiatives immediately.

Seek that infrastructure is upgraded when a trigger of 400 dwellings occupies sub area B,C & E

99 As outlined above previously in my evidence, the TPLM Variation provisions stage development to integrate with the provision of the infrastructure that is required for sub area B,C & E in order to provide the necessary access to and within these sub areas by walking, cycling, bus and private vehicles from the outset of development so that the development can benefit from the transport initiatives immediately. Delaying this to when 400 dwellings are occupied would mean that the first 400 occupied dwellings may not have sufficient access by walking, cycling, bus and private vehicles.

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7 Ladies Mile Property Syndicate (submitter 77), Ladies Mile Pet Lodge Limited (submitter 78), Koko Ridge Limited (submitter 80). Sanderson Group and Queenstown Commercial (submitter 93), Winter Miles Airstream Limited (submitter 94), Maryhill Limited (submitter 105).

Oppose the requirement to form specified transport infrastructure (including specifically the pedestrian underpass) prior to being able to commence construction on their site

100 As detailed in the Transport Strategy and provided for in the TPLM Variation, the transport infrastructure specified for each sub area is required to be in place before development of these sub areas to ensure that the necessary site access and active and public transport infrastructure is in place at the outset of development. This will ensure access is possible into the sub areas and that a choice in transport mode is provided at the commencement of development.

What is backup plan if mode shift does not eventuate?

101 The TPLM Variation provisions state that development within the sub areas shall not occur prior to completion of the required transport infrastructure works. Therefore, the necessary active and public transport modes infrastructure to provide mode choice will be provided from the outset of any development. I consider that This, combined with Transport Demand Measures (such as maximum car parking standards) and supporting travel behaviour change initiatives, will provide the necessary measures to encourage mode shift.

Seek clarity of Waka Kotahi's and ORC involvement

102 Submissions relating to the theme of clarity of Waka Kotahi's and ORC involvement were made within several submissions[8]The issues raised included "*There is no evidence presented in the Variation that Waka Kotahi is actively engaged with Council to satisfy the large-scale transport issues that could be activated by the Variation, with particular reference to the Shotover Bridge and specifically looking to increase road capacity across the Shotover River. This remains of significant concern to the community if the Variation should progress".*

103 As detailed in Waka Kotahi's submission (submission 104), Waka Kotahi has been involved in the development of the TPLM Masterplan and Variation through the Project Working Group (**PWG**) and the Project Control Group (**PCG**). Waka Kotahi stated that they appreciate the extensive engagement undertaken to date and look forward to continued

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8 Jake Allen (submitter 1), Lake Hayes Estate Community Association (submitter 79), Stuart Victor (submitter 89), Ferry Hill Trust (submitter 96).

input through the TPLM Variation. ORC were also involved throughout the project through the PWG and PCG.

Public transport

104 Submissions relating to the theme of public transport were made within numerous submissions[9]. The issues raised are discussed in the following paragraphs, in the format of a summary of the submitters comment in italics and my response following this:

Public Transport unreliable and not good enough (inefficient and ineffective)

105 Currently buses are stuck in the same peak period congestion as cars and therefore I would agree that bus service provision in its current form is unlikely to provide a significant mode shift away from private vehicles. The TPLM Masterplan and Variation, the W2G proposed future transport investment strategies and the under development ORC PTDBC intend to create a transport network with bus priorities/bus lanes, more bus services and better walking connections to bus stops so that public transport will be a realistic mode choice and generate a mode shift from private vehicles.

Rely on ORC to provide bus service every 10 minutes, currently unable to provide a service even hourly. Need this to work efficiently before further development

106 Significant enhancement of bus service frequency by ORC will be important for the success of TPLM. The ORC PTDBC is currently being developed and the effectiveness of the TPLM Variation and appropriateness of securing funding for this level service will be assessed.

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9 Ursula Davis (submitter 2),Richard Pettit (submitter 5), Nathan Brown (submitter 17), Nicole Fairweather (submitter 21), Kate Pirovano (submitter 26), Jim and Deirdre Robinson (submitter 27), Peter Chudleigh (submitter 35), Sam and Kylie Strain (submitter 54), Celine Austin (submitter 57), Margo Pryde (submitter 60). Blakely Wallace Family (submitter 74), Park Ridge Limited (submitter 75), Maree Wheeler (submitter 76). Ladies Mile Pet Lodge Limited (submitter 78), Lake Hayes Estate Community Association (submitter 79). Robyn Macleod (submitter 109). Rosemary Lee Crick (submitter 123).

No public transport / bus lanes could meet the demands of the development to solve this issue

107 The TPLM Transport Strategy is focussed on moving more people by less vehicles and I'm of the opinion that the provision of bus lanes and the enhanced level of bus service will meet the demands for TPLM future residents and visitors.

Public transport providers should be required to ensure a reliable, frequent and convenient public transport service, and corresponding infrastructure, in order to facilitate a modal shift

108 Significant enhancement of bus service frequency by ORC will be important for the success of TPLM. The ORC PTDBC is currently being developed and the effectiveness of the TPLM Masterplan and Variation and appropriateness of securing funding for this level of service will be assessed.

No population base to support public transport and Increasing the density of the area would not necessarily drive demand for public transportation up to the point where it would be financially viable or feasible

109 With 2,400 residential units and assuming a ratio of 2.1 people per unit for High Density would result in a population of circa 5,000 at TPLM). Add to this the existing population of 4326 at Shotover Country and Lake Hayes Estate (based on 2018 Census) indicates a population of approximately 10,000 which would benefit from the improved bus service frequency and bus infrastructure improvements. Based on the Transport Strategy predicted mode shares, I consider that this is a large enough population base for public transport services to be financially viable and feasible. Furthermore, some submitters have suggested the TPLM population will be 10,000 and the Lake Hayes Estate Shotover Country Community Association indicates the existing population is 6,900. With this population base of close to 17,000, this would indicate an even larger population base to support public transport.

Mode Change/ Mode Shift

110 Submissions relating to the theme of mode change/mode shift were made within a large number of submissions[10]. The issues raised are discussed in the following paragraphs, in the format of a summary of the submitters comment in italics and my response following this:

No evidence mode shift will happen and targets seem unrealistic and unfeasible

111 I acknowledge that the mode shift targets are challenging, but I consider that they are achievable given the high density and mix of uses proposed on the Site combined with the active and public transport mode infrastructure provisions within the TPLM Variation and future W2G partners investment in active and public transport modes. The Transport Strategy provides a body of evidence from elsewhere in New Zealand and internationally where large mode shifts have been achieved. Furthermore, as detailed in section 3.12 of the Transport Strategy, the introduction of the $2 bus fare in November 2017 along with changes to parking in Queenstown between November 2017 and March 2018 resulted in a 192% increase in patronage year on year. This highlights the potential for future step change modal shift in Queenstown.

Mode shift not suitable for all (e.g. shift workers, families, trips to retail and services industries in Frankton, tourism)

112 I acknowledge that there may be some residents and visitors who are unable to use active and public transport modes. However, as reported in the Transport Strategy, based on the findings from elsewhere in NZ

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[10] Graeme Dear (submitter 4). Richard Pettit (submitter 5), Jay Berriman (submitter 9), J G Newson (submitter 13), Nathan Brown (submitter 17), Katie Hill (submitter 19), Nadia Lisitsina (submitter 23), Jennifer James (submitter 25), Kate Pirovano (submitter 26), Jim and Deirdre Robinson (submitter 27), Geraldine McBride (submitter 31), Peter Chudleigh (submitter 35), Julie Johnston (submitter 38), Shane Pratley (submitter 41), Robert Burnell (submitter 47), Nicky Busst (submitter 49), Gary Erving (submitter 51), Peter Thompson (submitter 53), Sam and Kylie Strain (submitter 54), Neil McDonald & Clark Fortune McDonald & Associated Ltd (submitter 55), Celine Austin (submitter 57), Robert Cranfield (submitter 58), Margo Pryde (submitter 60), Wayne Stiven (submitter 65), Sarah and Blair O'Donnell (submitter 67). Nick Winstone (submitter 68), Blakely Wallace Family (submitter 74), Park Ridge Limited (submitter 75), Maree Wheeler (submitter 76), Ladies Mile Pet Lodge Ltd (submitter 78), Lake Hayes Estate Community Association (submitter 79), Melissa Read (submitter 87), Stuart Victor (submitter 89), Dennis Behan (submitter 90), Philippa Crick (submitter 97), Louise McQuillan (submitter 98), Tim Allan (submitter 103), Maryhill Limited (submitter 105), Robyn Macleod (submitter 109), Travis Sydney (submitter 110), Gordon Griffin (submitter 114), Maryann Bailey (submitter 116), Martin Barrett (submitter 118), Jane Hamilton (submitter 119), Rosemary Lee Crick (submitter 123).

and internationally, there is no evidence to support the assertion that some parts of society will not use active or public transport modes.

Winter weather not taken into account when considering mode shift

113 I acknowledge that there may be some residents and visitors who may not want to use active and public transport modes during winter weather. However, international evidence with similar winter conditions, indicates that even in wintery conditions people continue to use active and public transport modes. For example research reported in the 'Spinoff NZ indicates that:[11]

(a) Inclement weather is more likely to reduce weekend and off peak travel i.e. discretionary trips, than weekday commute trips.

(b) Bad weather has more serious effects in areas with less frequent services and without protected bus stops. Travellers in areas with more frequent services and well-designed shelters are less sensitive to bad weather.

(c) In areas with high population densities the effect of weather also appears to weaken particularly for active modes.

Mode shift not an acceptable solution to traffic congestion

114 The intention with the TPLM Variation is to provide high density residential development with key community facilities located within a short walking distance to enable a mode choice from private car to public and active transport modes and to provide investment in these modes. The proposed TPLM Variation provisions align with the W2G partners transport strategies and proposed investment in the surrounding transport network which will be targeted to enabling a mode shift from car to public and active transport modes.

Physical layout of Queenstown means mode shift is not realistic

115 TPLM Site is between 4km and 5km to Frankton. This distance equates to a 10 minute ebike journey time, which I consider to be a relatively short journey time. Queenstown CBD is about 12 km from TPLM which would be a 25 minute ebike journey time, which I consider to be an acceptable journey time. Both Frankton and Queenstown would be

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11 https://thespinoff.co.nz/society/11-04-2018/what-does-heavy-weather-do-to-the-transport-system

connected to TPLM via enhanced bus services and enhanced bus priorities providing a reliable and quick bus journey time. I therefore consider that mode shift is realistic in Queenstown.

Support mode shift but plan is inadequate

116 As detailed in the Transport Strategy, I consider the complementary mode change physical, travel behaviour and transport demand management measures to be more than adequate.

Relying on people using public transport because Shotover Bridge is failing does not represent sound resource management practice

117 The intention with the TPLM Variation is to provide high density residential development with key community facilities located within a short walking distance to enable a mode choice from private car to public and active transport modes and to provide investment in these modes. The proposed TPLM Variation provisions align with the W2G partners transport strategies and proposed investment in the surrounding transport network which will be targeted to enabling a mode shift from car to public and active transport modes. As such, I consider this represents very sound management of resources.

Likely people will still have their own private vehicles

118 I consider that this is very unlikely since the TPLM Variation has maximum car parking provisions, which will reduce private vehicle ownership.

Mode shift unrealistic given location in relation to employment etc

119 TPLM is approximately 4km to 5km to employment areas in Frankton. This short distance is a 10 minute ebike journey time, which I consider to be a relatively short journey time. Queenstown CBD is about 12 km from TPLM, which would be a 25 minute ebike journey time, which I consider to be an acceptable journey time. Both Frankton and Queenstown would be connected to TPLM via enhanced bus services and enhanced bus priorities providing a reliable and quick bus journey time. I therefore consider that mode shift is realistic in relation to employment locations.

Waka Kotahi: nominal 50% mode shift target significant departure from current 78% single private vehicle use

120 As stated in the Transport Strategy, Lake Hayes Estate and Shotover Country currently have a high dependency on car trips with 78% of journeys to work being drive alone. As detailed by the W2G partners, the overall alternative mode share (including public transport, walking and cycling, ride sharing and working from home) across the network will need to be in the order of 40% by 2028 and 60% by 2048 to maintain a functional transport network. I confirm that this is a significant departure from the current high dependency on car trips and needs to be achieved to maintain a functional transport network.

The transportation strategy contains examples of modal related activities from other parts of New Zealand and overseas. However, there appears to be little analysis on the compatibility of the examples with the Queenstown environment or in the case of any incompatibility, whether any contingency has been applied

121 The Transport Strategy provides examples of active and public transport mode and travel behaviour change activities in various parts of New Zealand including Queenstown, Auckland, New Plymouth, Hastings, Tauranga, Hawkes Bay, Dunedin, Hutt City, Wellington, Hamilton and Christchurch. I consider that these are appropriate and representative NZ city examples to compare with Queenstown.

122 International examples are drawn from various locations in Europe, USA and Canada, with also many similar attributes to Queenstown. As detailed in section 2.2 of the Transport Strategy of particular relevance is the comparison with Queenstown's sister city of Aspen, Colorado which has achieved a 67.8% non-car driver mode share for commuting. Aspen has many features in common with Queenstown including 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 (including similar winter weather conditions), 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. It has even similarly constrained access as Queenstown with one route in and out of the town centre. I therefore consider that the NZ and international examples are comparable with the Queenstown environment and are therefore suitable to use without the need to apply any contingency.

The transportation strategy does not appear to be any 'ground truthing' exercise or analysis to understand what proportion of the existing residents of Lake Hayes Estate and Shotover Country use the existing active transport network or whether they have any desire to do so in the future

123 As detailed in the Transport Strategy, the level of take up of active transport in Lake Hayes Estate and Shotover Country by commuters is currently low which reflects the high car dependency of these two communities given that all of the key community facilities are west of the bridge and also given the network gaps and generally poor current provision for pedestrians and cyclists. As reported in the Transport Strategy, there is an exception to this car dependency in terms of the 30% of trips to Shotover primary school which are by walk or bike. This demonstrates that even in a car dominated community, by providing key community facilities within easy walk and cycle distance then people will use active modes.

124 Therefore, by focussing the TPLM Masterplan and Variation on providing key local community facilities (which will also be within an easy walk or cycle distance of the Lake Hayes Estate and Shotover Country communities) combined with W2G partners future investment in active mode improvements, should provide the encouragement to use active modes. Furthermore, as reported in the Transport Strategy, the population of those living in Lake Hayes Estate and Shotover Country is predominately of an age to use active modes. Therefore, I consider that the Transport Strategy does 'ground truth' to understand what proportion of the existing residents of Lake Hayes Estate and Shotover Country use the existing active transport network. In terms of whether they have any desire to do so in the future is demonstrated by the 30% who walk or cycle to Shotover primary school demonstrating that if you provide local community facilities within an easy walk or cycle distance of Lake Hayes Estate or Shotover Country then people will use active modes.

In a region such as the Wakatipu Basin, dispersed destinations such as downtown Queenstown, Remarkables Park, Five Mile, Queenstown Airport, ski fields, Wakatipu High School, accessing regional towns such as Cromwell, Alexandra, Wanaka, or accessing the DOC estate which is a key benefit of living in this location, make reliance on private vehicles more practical and often absolutely necessary

125 As demonstrated in the Transport Strategy the majority of trips currently from Lake Hayes Estate and Shotover County are to Frankton and Queenstown. The intention with the TPLM Variation is to provide high density residential development with key community facilities located within a short walking distance to enable a mode choice from private car to public and active transport modes and to provide investment in these modes. The proposed TPLM Variation provisions align with the W2G partners transport strategies and proposed investment in the surrounding transport network which will be targeted to enabling a mode shift from car to public and active transport modes. As such, I consider that reliance on the private car (as is the existing situation) will not be the situation into the future.

Extrapolation of the 2018 Census data of 3.8% of households in Lake Hayes Estate and Shotover Country to the proposed 2,400 units at TPLM would give a minimum 2,309 vehicles accessing TPLM and the TPLM Variation does not guarantee that this situation won't eventuate

126 I do not agree with this extrapolation for a number of reasons including the maximum car parking standards within the TPLM Variation and also this simplistic approach does not take into account the high density residential development with key community facilities located within a short walking distance to enable a mode choice from private car to public and active transport modes and to provide investment in these modes. The proposed TPLM Variation provisions align with the W2G partners transport strategies and proposed investment in the surrounding transport network which will be targeted to enabling a mode shift from car to public and active transport modes.

Density being promoted is too high

127 As demonstrated in the Transport Strategy at least 40 to 60 dwellings/Ha are needed to support a viable public transport network and hence deliver mode choice. International research indicates that at 40 units/Ha there is a 20% reduction in vehicle trips compared to 20 units/Ha and at 60 units/Ha there is a 33% reduction compared to 20 units Ha. Therefore, I consider that the medium and high density proposed within TPLM Variation is required in order to support a viable public transport network and deliver mode choice for residents and visitors.

Construction effects on traffic

128 Submissions relating to the theme of construction effects on traffic were made within several submissions[12]. The issues raised are discussed in the following paragraph, in the format of a summary of the submitters comment in italics and my response following this:

Construction will have effects on nearby residents for years, safety concerns from large construction vehicles coming and going, construction materials coming from Glenda Drive on very busy stretch of road and Construction of school will create congestion during construction phase

129 As part of subsequent consenting of any resource consent applications submitted for development at TPLM, conditions would be imposed by QLDC relating to submission and approval of a Construction Traffic Management Plan (**CTMP**). The CTMP would form part of a comprehensive suite of environmental controls within a Construction Environmental Management Plan (**CEMP**) for the construction phase of any development. The CTMP typically addresses the potential construction traffic effects associated with the construction of a project and sets out how the impacts of construction traffic would be mitigated.

Cycle / walking trail connections

130 Submissions relating to the theme of cycle and walking trail connections were made within numerous submissions[13]. The issues raised are discussed in the following paragraphs, in the format of a summary of the submitters comment in italics and my response following this:

Variation must provide proper walkways along roads

131 Adequate provision for footpaths is provided within the street cross sections detailed in the Structure Plan at Rule 49.8 of the TPLM Variation.

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12 Tim Sanders (submitter 6), Jay Berriman (submitter 9), Hamish MacPherson (submitter 29), Nicky Busst (submitter 49), AA Southern Lakes (submitter 56).

13 Sandy Waddingham (submitter 7), Jennifer James (submitter 25), Shane Pratley (submitter 41), Lloyd and Debbie Anderson (submitter 48), Romain Kuhm (submitter 64), Sarah and Blair O'Donnell (submitter 67), Ladies Mile Property Syndicate (submitter 77), Stephen Brent and Sheena Haywood (submitter 92), Sanderson Group and Queenstown Commercial (submitter 93), David Finlin (submitter 101). Robyn Macleod (submitter 109), Janie Reese and Rob Lee (submitter 112), Kirsty and Justin Crane (submitter 115), Louise and Philip Keoghan (submitter 120).

Concern connections won't happen (developer's won't provide these), Proposal needs proper protecting cycling and walking trails (currently unsafe), Concerns regarding routes, timing and design

132 Adequate provision for cyclists and pedestrians is provided within the street cross sections detailed in the Structure Plan at Rule 49.8 of the TPLM Variation.

Walking and cycle accessibility not in line with best practice and reach of these modes overstated

133 As identified in the Transport Strategy, the proposed walking and cycling interventions are based on current best practice guidance and standards and also based on research from elsewhere in NZ and internationally.

There should be a pedestrian/bike path on the bridge so that residents also have this option to get over the river

134 Waka Kotahi do not have any plans to widen or provide an additional bridge over the Shotover River. Pedestrians and cyclists can cross the Shotover river using the existing active mode link across the old Shotover Bridge.

Installing pedestrian lights to cross SH6 will further disrupt traffic. All crossings need to be underpasses or bridges to maintain flow of traffic

135 The TPLM Variation provisions include for new at grade crossings on SH6 to assist pedestrians and cyclists (including school children) to cross safely and these crossings will be designed taking into account the phasing of the signals to minimise impact on traffic flows. Signalised at-grade crossings are generally considered to be the optimal form of pedestrian crossing due to the ease of accessibility, and safety and security for all users. As detailed in the TPLM Variation an underpass to cross SH6 is preferred at the SH6/Howards Drive intersection.

Need separated cycleway Ladies Mile to Frankton

136 Cyclists can currently cycle between TPLM and Frankton and avoid riding on SH6 by using the existing cycle trail via Lower Shotover Rd, Spence Road, the old bridge and then the Twin Rivers/Queenstown Trail to Frankton. As detailed in the Transport Strategy, the W2G partners are planning several improvements to the active travel network in the

TPLM /Lake Hates Estate area including improved walking and cycle connections between Lake Hayes Estate and Frankton.

Modelling

137 Submissions relating to the theme of modelling were made within a large number of submissions . The issues raised are discussed in the following paragraphs, in the format of a summary of the submitters comment in italics and my response following this:

Concern as to actual vehicle trips generated as a result of 2400 units and the report relies on population assumptions that fails to take into account newly consented developments around the wider basin and new visitor growth

138 As detailed in Section 6 of the Transport Strategy, the impact (including calculation of vehicle trips generated) of the TPLM Masterplan on the adjacent transport network has been assessed using the W2G partners Queenstown Strategic Transport Model. Furthermore as detailed in previously in my evidence, the modelling work has been updated with the latest version of the Strategic and Public Transport Models which takes into account updated consent and future developments. This is the same transport model used by the W2G partners to assess the impact of future land development growth across Queenstown and to support business cases for transport infrastructure investment within Queenstown. As such, I consider that using this transport model is a consistent basis for calculating vehicle trip generation across Queenstown and for accounting for all consented development and future housing growth.

Seek that scientifically proven road traffic models be incorporated into proposal

139 As detailed in Section 6 of the Transport Strategy, the W2G partners Queenstown Strategic Transport Model was used for the assessment of TPLM Masterplan and my evidence reports on the findings from the recent updates to the models and I consider that this is a proven traffic model.

Concern that population data used from 2018 census and traffic data from November 2020 (affected by Covid) and used dated modelling data

140 As detailed in Section 6 of the Transport Strategy, the 2048 base year from the W2G partners Queenstown Strategic Transport Model was used to assess the impact of TPLM Masterplan and not 2018 or 2020 data. Furthermore, my evidence reports on the findings from using the recent updated transport model which was used to assess the 2053 situation. My evidence also reports on confirmation that the 2018 and 2020 count and queue data validates against June 2023 data.

Modelling does not take into account that not just families will live in units (e.g. flatmates with separate cars)

141 As detailed in the TPLM Variation provisions, maximum car parking standards will apply and therefore residents will move into the TPLM knowing that there is restricted car parking available. Therefore, I do not consider that the modelling needs to take into account that flatmates with separate cars will live in the units.

Evidence does not support what level of density is required to achieve complete modal shift

142 As detailed in Appendix H of the Transport Strategy, international research indicates that at least 40 to 60 dwellings/Ha are needed to support a viable public transport network. Furthermore, at 60 dwellings/Ha there is a 33% reduction in vehicle Kms travelled compared to 20 dwellings/Ha and 17% reduction compared to 40 dwellings/Ha. I therefore consider that there is sufficient evidence to demonstrate the level of density required to achieve mode shift.

The report relies on "anecdotal evidence"

143 The Transport Strategy refers to 'anecdotal evidence' in respect of the following two issues relating to queue lengths:

(a) Section 3.19 in reference to very little queueing on SH6 during the school holidays. I made reference to this being anecdotal evidence since no queue length surveys were carried out during the school holidays. However, during the various community engagement events on the TPLM, various members of the public stated that there were no traffic problems in the school holidays and this is also confirmed in Submission number 62.

(b) Section 3.11 in reference to queue lengths on SH6 being longer than those observed. I made reference to this being anecdotal

evidence since during the community engagement events on the TPLM Masterplan various members of the public stated that queue lengths vary in length by particular day and this is also confirmed in differing queue lengths stated in several of the submissions.

At the very least, an expert review of this transport masterplan strategy (preferably by an unbiased independent third party with local knowledge, outside of existing QLDC/Alliance) needs to be conducted. This review should completely revise the traffic assessment based on 2023 data during winter and summer peak periods, and use 2023 growth projections for the future for the whole district and surrounds, accompanied by real life surveying of existing residents travel demands and propensity for change to public transport. This would be a significant scope of work.

144 As detailed in Section 6 of the Transport Strategy, the impact of the TPLM Masterplan on the adjacent transport network has been assessed using the W2G partners 2048 Queenstown Strategic Transport Model. This is the same transport model used by the W2G partners to assess the impact of future land development growth across Queenstown and to support business cases for transport infrastructure investment within Queenstown. As such I consider that using this transport model is a consistent basis for calculating the impact of TPLM Variation. Furthermore, as detailed previously in my evidence, the modelling work has been updated with the latest version of the Strategic and Public Transport Models which takes into account updated consented and future developments for a 2053 assessment year.

Parking

145 Submissions relating to the theme of parking were made within several submissions[14]. The issues raised are discussed in the following paragraphs, in the format of a summary of the submitters comment in italics and my response following this:

Increase the number of cars spaces required per dwelling, delete the standard specifying a maximum car parking. The imposition of a maximum parking area is therefore not aligned with recreational aspirations of residents in the QLDC region. Concerned that the provisions of the LMV relating to traffic (including

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[14] Nicole Fairweather (submitter 21), AA Southern Lakes (submitter 56), Koko Ridge Limited (submitter 80), Winter Miles Airstream Limited (submitter 94), Milstead Trust (submitter 108), Gordon Griffin (submitter 114), Martin Barrett (submitter 118).

apparent discouragement of private vehicle ownership) are unduly restrictive, onerous and contrary to sound resource management planning. It is submitted that the number of parking spaces, particularly in the LDR and MDR Precincts are too onerous and should be amended to allow 2 parking spaces for 3 bedroom single detached houses in the LDR Precinct and terraced housing in the MDR Precinct.

146 As detailed in the Transport Strategy, one of the key focus areas is to have restrictive maximum residential car parking standards in order to support the required mode choice at TPLM and reduce overall private car use. Therefore, I would not agree with increasing the number of car park spaces per dwelling or removing the maximum standards. This also is the approach being adopted by QLDC as indicated in Mr Pickard's evidence.

People living within Ladies Mile will, of course, still all own (and use) cars causing significant problems. It has been stated that there will be minimal parking provision for vehicles in the new town. However, cars are a necessity for most people and council cannot control this. Given this lack of parking options in the proposed new town, a future problem is inevitable. With the likelihood of up to 1,000 vehicles unable to park in the new town there will be chaotic parking in all areas adjacent to Ladies Mile.

147 Residents will choose to move into TPLM knowing there is restricted car parking and that high quality public and active transport modes will be available as an alternative to car travel.

Streets are being designed with 'cyclists and pedestrians' in mind with 'slow' vehicle movements from which we take that there will be very limited 'on street' parking allowed – what provisions are in place for parking hubs? We don't think assuming residents will just choose not to have personal vehicles is sufficient evidence to ignore parking requirements

148 It is correct that streets are being designed for people rather than vehicles and there will be very limited on street parking available. Residents will choose to move into TPLM knowing there is restricted car parking and that high quality public and active transport modes will be available as an alternative to car travel.

The allocation of one visitor carpark space per 50 students is just not realistic (29.10.7)

149 As detailed in Rule 29.10.7, this is 1 visitor cycle park per 50 students, not 1 car park.

Parking will be needed associated with any commercial area and with any school

150 As detailed in the Transport Strategy and TPLM Variation provisions, car parking provisions are made for the commercial area and the schools.

Clarification whether TPLM Variation provisions Rule 29.5.25.1 (uncovered carparking) is in addition to the maximum parking rates

151 This is not additional to the maximum car parking rates.

Increase the LDR maximum car park rate to 2 car spaces for 3 + bedrooms

152 For the LDR areas I would agree with increasing the maximum car park ratio from 1.5 to 2 spaces given that the average of 1.5 could be more difficult to apply to the small number of LDR units proposed.

Provide additional storage area for eg boats I would not agree with including additional parking space for boats since this would not be an efficient use of the space.

153 As done elsewhere in NZ, these can be stored offsite.

Service Station

154 Submissions relating to the provision of service stations to be allowed as a Discretionary or Restricted Discretionary activity were made within three submissions[15]. From a transport perspective, since trips to a service station are typically already on the network and would be pass by trips (i.e. they would simply turn off and back onto SH6), then these would not be new generated trips and, as such, the transport impact of a service station would be negligible.

Park and Ride

155 AA Southern Lakes (submitter 56) indicates that park and ride should be encouraged as another transport option. As detailed in the Transport Strategy, QLDC have investigated park and ride options on the eastern corridor including preparation of a draft Park and Ride Business Case.

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[15] Shotover Country Limited (submitter 46), Glenpanel Development Ltd (submitter 73), Milstead Trust (submitter 108).

As highlighted in section 6.2.4 of the Transport Strategy, Park and Ride mode share for TPLM is anticipated to be zero given that a high frequency bus service would already be provided and that residents would have to spend time driving to the park and ride site and then catch the bus. Park and Ride though could contribute to a reduction in existing car alone trips on SH6 and this will be subject to any future business case work carried out by QLDC. I understand though that work on the park and ride business case has been put on hold by QLDC.

Howards Drive intersection

156 Ladies Mile Pet Lodge Limited (submitter 78) raises a concern that SH6 and Howards Drive roundabout may impede access to Pet Lodge. This roundabout will be constructed by Waka Kotahi as part of the NZ Upgrade Programme (NZUP) and as such Waka Kotahi are dealing with the designs for this intersection.

Sylvan street

Allan Meredith (submitter 22) disagrees with the Sylvan Street Link in terms of *impact of noise, dust and light on adjacent properties during and post construction. Concerns were also raised that the road is also very narrow and already it is a struggle for two vehicles to drive along with cars parked on the side of the road. Why build another road when there is already one in Howards Drive that vehicles and buses can easily access and keep your proposed bus route the same. Another road means another round about which slows traffic further and creates congestion at the entrance to Queenstown-does not make sense as there are so many already. The Sylvan Street link should just be for non-motorised transport eg bikes and walking. This would get rid of the noise, lights problem, reduces costs, separates pedestrians from motorised vehicles and the bus route only needs a minor variation i.e. up and down Howards Drive as occurs at present.*

157 As detailed in the Transport Strategy and TPLM Masterplan, the Sylvan Street link is proposed as a future bus, walk and cycle connection between Lake Hayes Estate and SH6 and TPLM. This will provide a quick and easy walk/cycle connection between the east side of Lake Hayes Estate and the community facilities at TPLM and also provides a quicker bus connection between Lake Hayes Estate and TPLM than using Howards Drive. Construction impacts for this link road would be addressed within a Construction Traffic Management Plan and any noise

and light impacts resulting from buses using the road would be addressed as part of any future consenting for construction of this road. No parking would be provided on this new link road and should there be issues on Sylvan Street regarding existing on street parking inhibiting bus movements, then this could be addressed by QLDC through implementation of on street parking controls.

Conclusions

158 Based on the current reliance on the car as the main form of transport, it is my opinion that congestion will only continue to increase in the future and the provision of more road capacity will only compound congestion. This is not sustainable going forwards and hence the reason why the W2G partners transport strategies are focussed on investment to achieve mode shift from car to public and active transport modes rather than perpetuating the problems arising from car oriented infrastructure.

159 The TPLM Variation provisions complement this by providing high density residential development within walking distance of key community facilities as well as focussing investment on public transport and active modes in order to move more people by less vehicles.

160 Transport modelling demonstrates that the transport impact of TPLM (with the proposed public transport measures) will be acceptable and will be managed such that the safe, effective and efficient operation of the transport network can be achieved.

161 Multiple submissions were received relating to transport matters and I have addressed each of these matters in my evidence.

162 Therefore, in relation to transport, I see no reason not to approve TPLM Variation as amended.

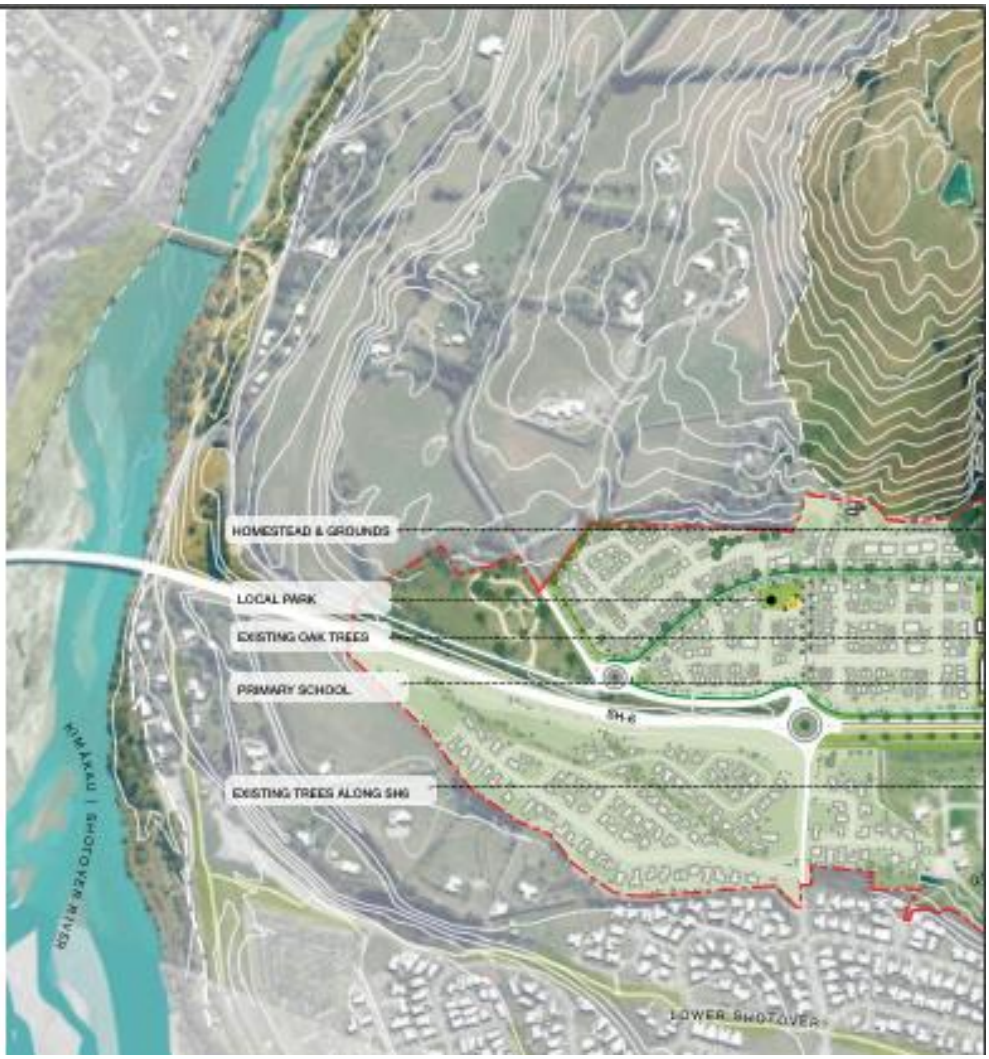
Colin Robert Shields

29 September 2023

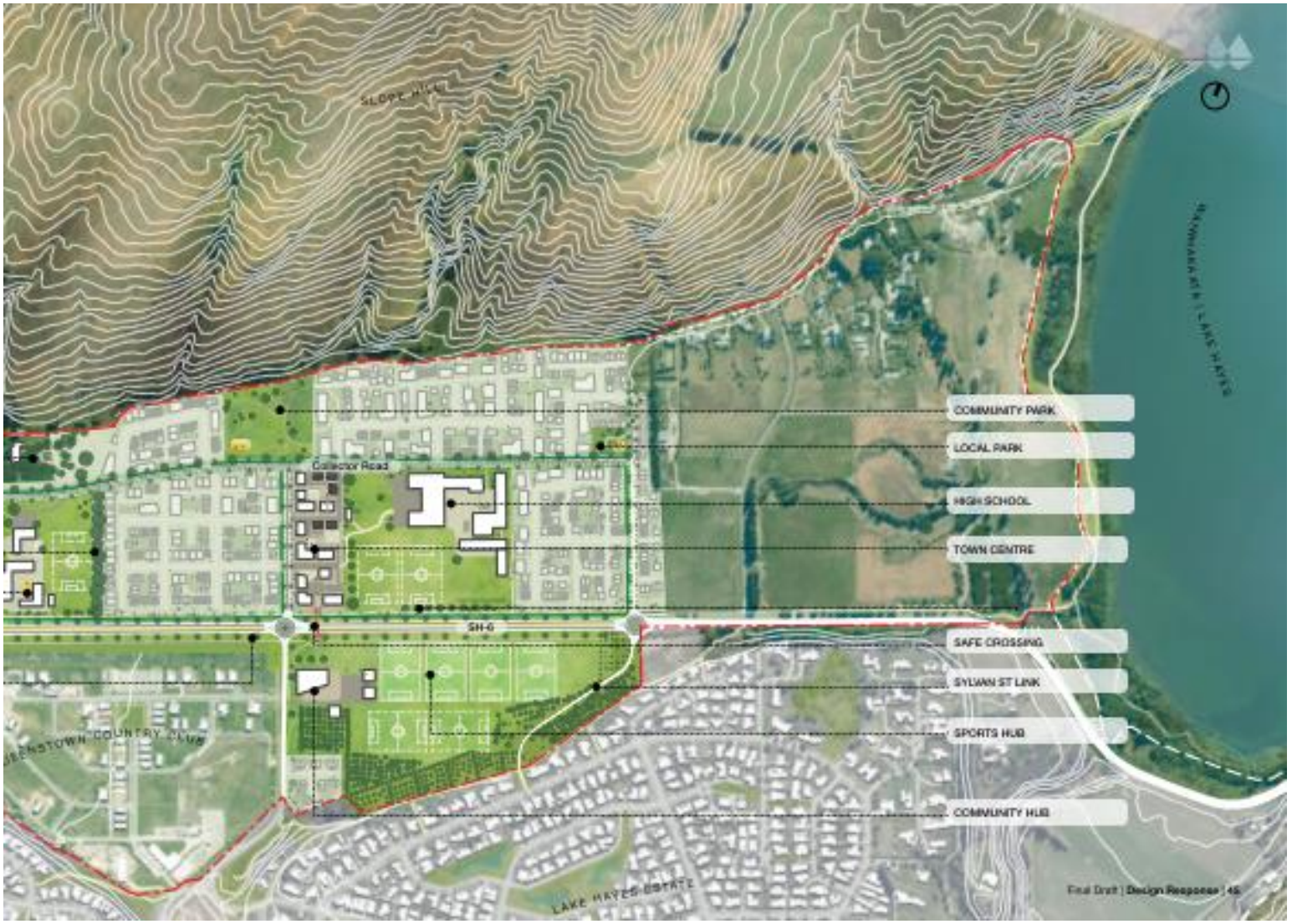
Appendix A – TPLM Masterplan

Illustrative Masterplan

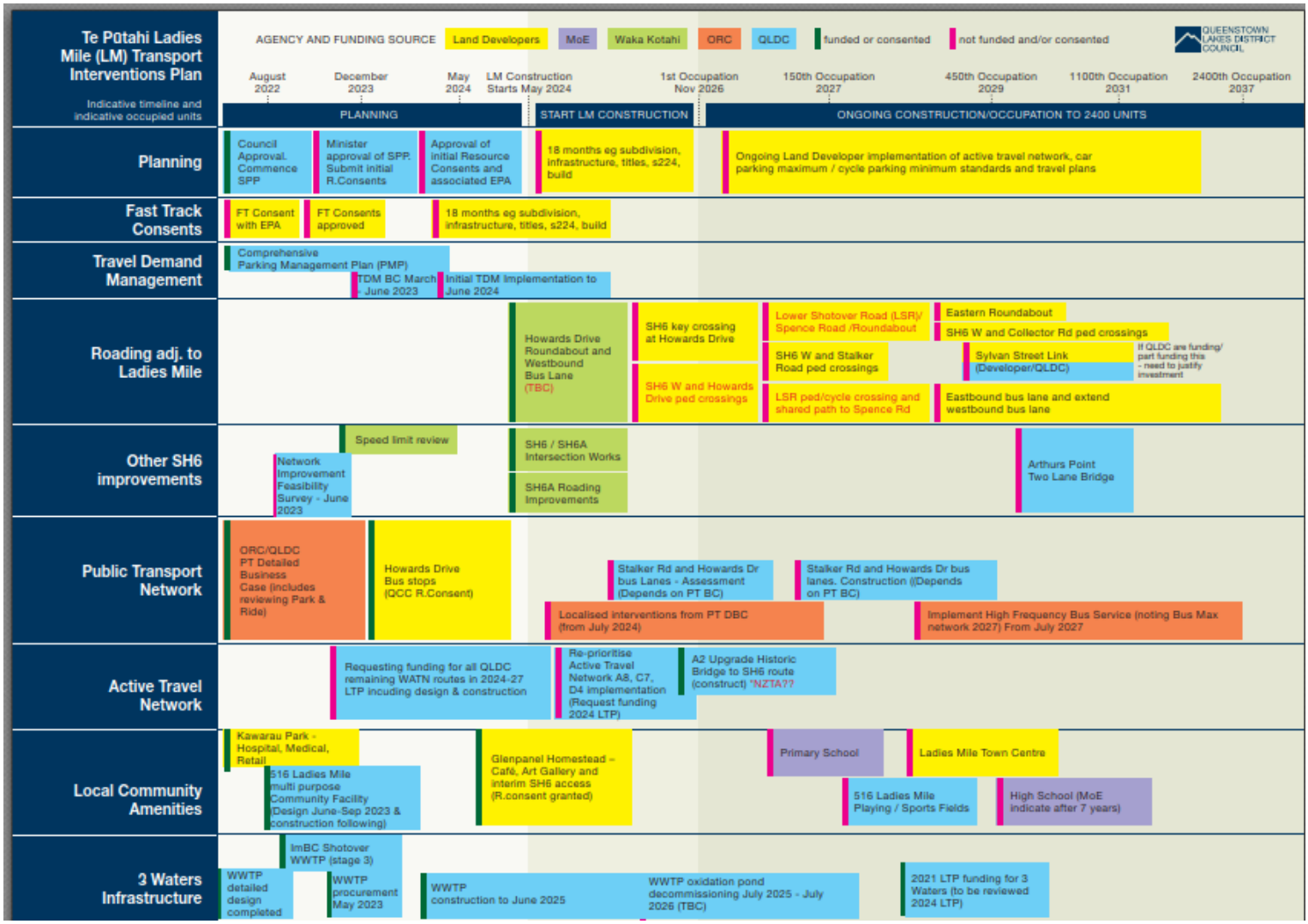
The Illustrative Masterplan provides a possible future for Te Pūtahi Ladies Mile.
The Masterplan is indicative only, and provides an impression of what the site could look like in the future.



Note: The illustrative school locations and layouts are indicative only and are subject to confirmation by Ministry of Education.


SLOPE HILL
COMMUNITY PARK
LOCAL PARK
Collector Road
HIGH SCHOOL
TOWN CENTRE
SH-6
SAFE CROSSING
SYLVAN ST LINK
SPORTS HUB
COMMUNITY HUB
LAKE HAYES ESTATE
Final Draft | Design Response | 45

Appendix B - TPLM Transport Interventions Plan



Appendix C - Technical Memo

Draft Memo

To:	QLDC/Waka Kotahi	**Job No:**	1091554
From:	Colin Shields	**Date:**	27 September 2023
cc:			
Subject:	TPLM – Review of Updated Transport Modelling and Data (Rev A)		

Executive Summary

Based on Waka Kotahi requests to review and update data used in the TPLM Transport Strategy and to review outputs from the recently updated Queenstown Strategic and PT models the following is concluded:

SH6 traffic volumes between 2018 to 2023

Based on Waka Kotahi permanent counter sites on SH6 adjacent to Ladies Mile for the period 2018 to 2023 (part of) the following is concluded:

- Post covid traffic volumes on SH6 in 2022 have largely returned to 2018 pre covid levels and the partial data for 2023 indicates flows are approximately 6% higher. As such, reference to 2018 data in the TPLM Transport Strategy report is considered to be a reliable indicator of present day traffic flows.

Updated queue length data

Based on June 2023 QLDC Blue tooth journey time data, the following is concluded:

- SH6 eastbound AM peak BP roundabout to Lake Hayes Road - no queues and delays.
- SH6 eastbound PM peak BP roundabout to Lake Hayes Road - up to 6 minute delay, with 5 of these minutes on the BP roundabout to Hawthorne Drive section.
- SH6 westbound AM peak Lake Hayes Road to BP roundabout , delays between Howards Drive and Stalker Road of up to 5 minutes and between Stalker Road and Hawthorne Drive (across the bridge) of up to 3 minutes.
- The QLDC June 2023 Bluetooth data confirms the findings from the queue surveys reported in the Transport Strategy.

Bus Journey time data

Based on June 2023 ORC bus journey time data the following is concluded:

- From Tucker Beach Road (just west of the bridge) to Jones Avenue AM peak - no queues and delays.

- From Tucker Beach Road (just west of the bridge) to Jones Avenue PM peak - up to 4 minute delay.
- From Jones Avenue to Tuckers Beach Road AM peak – up to 6 minute journey time delay for buses northbound on Stalker Road.
- From Jones Avenue to Tuckers Beach Road PM peak- no queues and delays.
- The ORC June 2023 bus journey time data confirms shorter queues and delays from the queue surveys reported in the Transport Strategy.

Updated Transport Modelling

- Comparison of the 2053 with and without TPLM predicted flows (post PT modelling) results indicates that the Shotover Bridge will be operating within capacity for the AM, IP and PM peaks for the 2053 base year both with and without TPLM. The exception is the PM peak eastbound with TPLM, which will be very marginally above capacity (only by 10 vehicles). Therefore, it is considered that the 2053 base model predictions (both with and without TPLM) indicate that there would not be any link capacity issues with TPLM and the proposed public transport measures on the surrounding transport network.
- Comparison of the 2053 with and without TPLM predicted flows (pre PT modelling) results indicate that without TPLM the Shotover Bridge eastbound will be over capacity in the PM peak. With TPLM the Shotover Bridge will be over capacity in the AM peak westbound and in the PM peak eastbound. Therefore, it is considered that the 2053 base model predictions (both with and without TPLM) demonstrate the need for public transport investment to achieve mode shift and an operational transport network as set out by the W2G partners and as set out in the TPLM Masterplan and Variation.
- In terms of the distribution of TPLM trips the Queenstown Transport Strategic and PT models predict a large number (27% to 38%) of all TPLM trips to remain internal to the site. Key destinations for external trips include the adjacent Basin areas, Frankton and Queenstown CBD. For the external trips the models predict a 24% to 49% public transport modal share.
- The Models are based on a predicted AM and PM peak bus mode share of 21% to 22%. For the reasons outlined in the Transport Strategy, this is considered to be an underestimate of the expected non car mode share at TPLM since it does not take into account mode shift arising for example, from the proposed TPLM Variation and W2G partners active mode, Travel Behaviour Change or Transport Demand Measures. However, the model indicates that even with this lower PT mode share, that there will be limited capacity issues on the adjacent road network.
- The models predict AM and PM peak bus mode share of 18% to 19% at Lake Hayes Estate/Shotover Country. This is a substantially greater bus mode share than currently exists at Lake Hayes Estate and Shotover Country. The model demonstrates that with public transport investment by W2G partners and with the TPLM Masterplan, mode shift can be achieved at Lake Hayes Estate and Shotover Country.
- The models predict AM and PM peak bus mode share of 20% to 21% across the Shotover Bridge. This is a substantially greater bus mode share than currently exists across the

Shotover Bridge. The model demonstrates that with public transport investment by W2G partners and with the TPLM Masterplan, mode shift can be achieved across the Shotover bridge with the model predicting that the bridge will work at capacity at 2053 with TPLM with public transport investment. It should also be noted that the 2053 base model plus TPLM predicted bus trips are very close to the targets set within the ORC PTDBC of 772/869 bus passengers on Shotover bridge for the bridge to operate at 90% volume/capacity ratio for general traffic.

- As noted by the consultants operating the Models, the modelling suite is a fixed demand matrix, so there is no (or little) account of any temporal effects such as peak spreading and trip suppression; or any behavioural effects such as trip chaining due to congestion. Therefore, the overall demand could be considered worst case in the peak hour periods.

Sidra capacity assessments of SH6/Stalker Road and SH6/Howards Drive (NZUP) roundabouts

- With adjustments applied to the Sidra models (to account for the existing AM peak queues from Shotover bridge to east of Howards Drive), both roundabouts are predicted to operate above capacity in the AM peak with existing traffic flows.
- In the PM peak with existing traffic flows, both roundabouts are predicted to operate within capacity.
- For the 2053 Base with TPLM (post PT modelling), at the existing SH6/Stalker Road roundabout in the AM peak the Sidra model predicts long queues and delays on Stalker Road. In the PM peak the roundabout will operate within capacity. As identified in the Transport Strategy, the preference would be to introduce traffic signal control at this intersection to improve operational performance and introduce controlled crossings for pedestrians and cyclists.
- For the 2053 Base with TPLM (post PT modelling), at the NZUP SH6/Howards Drive roundabout in both the AM and PM peaks the Sidra model predicts the NZUP roundabout will operate within capacity. . As identified in the Transport Strategy, the preference though would be to introduce traffic signal control at this intersection to introduce controlled crossings for pedestrians and cyclists.

1 Background

1.1 Following meetings with Waka Kotahi on 13 July, 21 July and 27 July (and various subsequent emails), the following modelling work was requested to update the work carried out within the TPLM Transport Strategy:

- Compare traffic count data on SH6 Ladies Mile pre and post Covid.
- Review queue length survey data on SH6.
- Review bus journey time data.
- Review emerging Queenstown Public Transport Detailed Business Case (PTDBC) PT targets.
- Update the transport modelling work using the recently updated Queenstown Strategic Transport Model and Public Transport Model.
- Carry out Sidra modelling of SH6/Stalker Road/Lower Shotover Road/TPLM access intersection and SH6/Howards Drive/TPLM access intersection to understand the performance of the roundabouts.

1.2 This memo reports on the findings from the above work.

2 Comparison of SH6 traffic count data pre, during and post Covid

2.1 Based on the Waka Kotahi permanent count data site on SH6 between Howards Drive and Stalker Road (Traffic Management System (TMS) site # 00600991), Table 2.1 below summarises the Annual Average Daily Traffic (AADT) flows between 2018 and 2022 and the average daily traffic flows for January-August 2023. It should be noted that the 2023 data is obviously for an incomplete year and therefore may not as yet be a reliable comparator.

Table 2.1: AADT 2018-2022 and average daily traffic flows in January-August 2023 at TMS site #00600991

	2018	2019	2020	2021	2022	2023*
AADT	16,882	17,168	15,068	15,826	16,682	17,876
Change from previous year	N/A	1.7%	-12%	5.0%	5.4%	7.1%

Note: Negative change indicates reduction in traffic volume from previous year.

*Average of all available daily traffic volumes recorded (both light and heavy) between 1 January and 27 August 2023.

2.2 Table 2.2 below summarises the AADT between 2018 and 2022 and the average daily traffic flows in January-August 2023 for TMS site # 00600993 west of Shotover Bridge.

Table 2.2: AADT 2018-2022 and average daily traffic flows in January-August 2023 at TMS site #00600993

	2018	2019	2020	2021	2022	2023*
AADT	24,919	Not Available	20,906	23,152	24,318	26,140
Change from previous year	N/A	N/A	-16%	10.7%	5.0%	7.4%

Note: Negative change indicates reduction in traffic volume from previous year.
*Average of all available daily traffic volumes recorded (both light and heavy) between 1 January and 27 August 2023.

2.3 For TMS site # 00600988 (east of Howards Drive), Table 2.3 summarises the AADT between 2018 and 2022 and the average daily traffic flows in January-August 2023:

Table 2.3: AADT 2018-2022 and average daily traffic flows in January-August 2023 at TMS site #00600988

	2018	2019	2020	2021	2022	2023*
AADT	13,034	13,278	11,281	11,664	12,607	14,064
Change from previous year	N/A	1.8%	-15%	3.4%	8.1%	11.6%

Note: Negative change indicates reduction in traffic volume from previous year.
*Average of all available daily traffic volumes recorded (both light and heavy) between 1 January and 27 August 2023.

2.4 The above AADT data indicates that post covid traffic volumes on SH6 in 2022 have largely returned to 2018 pre covid levels and the data so far for 2023 indicates flows are approximately 6% higher. As such, reference to 2018 data in the TPLM Transport Strategy report is considered to be a reliable indicator of present day traffic flows.

3 Updated queue length data

3.1 Waka Kotahi agreed that existing QLDC Bluetooth journey time data could be used to review peak period queueing on SH6, post Covid. Weekday journey times between the SH6/6A (BP) roundabout and Howards Drive eastbound and westbound were provided for a 12 month period (July 2022 to July 2023) at 15 minute intervals 06:00-21:00. Journey time data was not

available on Stalker Road or Howards Drive. The sample size is approximately 20% of traffic passing between both nodes (shown in green below) on the route (shown in blue below). An extract of the survey area analysed is shown below:

3.2 The routes analysed were:

- Eastbound **Nodes 341>342>438>574 routes 2598-2600-3096**
- Westbound **Nodes 574>438>342>341 routes 3097-2601-2599**

3.3 The 0800-0900 period was used for the AM peak and 1700-1800 for the PM peak. A free flow journey time (i.e. the journey time expected when there is much lower traffic volumes and hence no congestion or delays) was assumed to be the 1900-0000 and 0500-0700 periods. Using data from June 2023, average and maximum journey times in minutes are summarised in Tables 3.1 and 3.2 below:

Table 3.1: Average and maximum journey times for SH6 eastbound (i.e. from Queenstown)

	BP to Hawthorne Dr (2598)	Hawthorne Dr to Stalker Rd (2600)	Stalker Rd to Howards Dr (3096)	Howards Dr to Lake Hayes Rd (7154)	Total
AM peak average time	1.8	2.3	1.0	2.6	7.7
AM peak max time	2.0	2.5	1.1	2.8	8.0
PM peak average time	3.2	3.2	1.0	2.4	9.8
PM peak max time	6.4	3.7	1.1	2.6	13.2
Average Free flow time	1.6	2.1	0.9	2.5	7.1

Table 3.2: Average and maximum journey times for SH6 westbound (i.e. to Queenstown)

	Lake Hayes Rd to Howards Dr (7155)	Howards Dr to Stalker Rd (3097)	Stalker Rd to Hawthorne Dr (2601)	Hawthorne Dr to BP (2599)	Total
AM peak average time	3.6	3.8	3.4	2.0	12.9
AM peak max time	4.7	6.0	5.1	2.6	16.5
PM peak average time	3.2	1.1	2.2	5.4	11.9
PM peak max time	4.3	1.2	2.4	13	19.2
Average Free flow time	3.0	0.9	2.1	1.7	7.6

3.4 Key findings from analysis of the journey time data includes:

3.5 SH6 eastbound between BP and Lake Hayes Road

- AM peak journey time being about 8 minutes is very close to the free run time, indicating no queues or delays.

- PM peak journey time up to 13.2 minutes, which is up to a 6 minute delay compared to the free run time, indicating some queues. The largest variation in journey time occurs on the section between the BP roundabout and Hawthorne Drive, where there is up to a 5 minute delay compared to the free run time.

3.6 SH6 westbound between Lake Hayes Road and BP

- In the AM peak compared to the free flow journey time, journey times between Howards Drive and Stalker Road are up to 5 minutes longer and between Stalker Road and Hawthorne Drive (across the bridge) are up to 3 minutes longer. This indicates some queues and delays on the section between Howards Drive and Hawthorne Drive.
- In the PM peak compared to the free flow journey time, journey times between Hawthorne Drive and BP are up to 12 minutes longer, elsewhere journey times are similar to free run travel times. This indicates some queues and delays on the section between Hawthorne Drive and BP.

3.7 In respect of the Queue length survey reported in Section 3.11 of the Transport Strategy, the 2023 journey time data confirms the findings in the Transport Strategy noting the 2020 queue survey indicated an 11 minute journey time in the AM peak from the back of the queue on SH6 (east of Howards Drive) to Grant Avenue (just beyond Hawthorne Drive) of 11 minutes, whilst the 2023 data indicates a journey time of 12.9 minutes. A worsening in travel time reflects the higher traffic flows in 2023 than 2020, as evidenced in section 2 above.

3.8 The 2023 journey time data also confirms the findings of the Transport Strategy queue length survey which indicates that queues are not static but more of a slow moving (20 km/h) queue. From the back of queue east of Howards Drive to Hawthorne Drive is approximately 4km. At an average speed of 20 Km/h then this would equate to a travel time of 12 mins, which is very close to the journey time observed in 2020 and very close to the journey time from the 2023 data.

4 Bus journey time data

4.1 ORC provided weekday bus journey time data from ticketing information for June 2023, on SH6 between the BP roundabout and Howards Drive eastbound and westbound and also on Stalker Road. The results are summarised below:

4.2 Route 5 eastbound - From Tucker Beach Road (just west of the bridge) to Jones Avenue is a journey time of circa 6 minutes in the AM peak and 10 minutes in the PM peak. Out of the

peak period the journey time is 6 minutes, which is indicating a 4 minute journey time delay for buses in the PM peak.

4.3 Route 5 westbound -Jones Avenue to Tuckers Beach Road is a journey time of just under 10 mins in the AM peak and 4 minutes in the PM peak. Out of the peak period the journey time is 4 minutes, which is indicating a 6 minute journey time delay for buses northbound on Stalker Road in the AM peak.

4.4. These journey times are shorter than those reported in section 3.11 of the Transport Strategy, where an AM peak journey time of 12 minutes was recorded on Stalker Road. It is considered that the journey time reported in the Transport Strategy is a more accurate record of delays and queues on Stalker Road.

5 Queenstown Public Transport Detailed Business Case (PTDBC) PT targets

5.1 Information has been provided from ORC/WSP (who are preparing the PTDBC), on critical target PT shares on the three main pinch points in the network as shown in the table below:

Table 19: Critical PT mode share targets

		AM peak hour		PM peak hour	
		PT share	PT Pass/hour	PT share	PT Pass/hour
2027	SH6A	27%	592	28%	594
	Shotover Bridge	18%	323	18%	369
	Kawarau Falls	11%	186	7%	123
2039	SH6A	40%	1082	40%	1028
	Shotover Bridge	25%	514	29%	657
	Kawarau Falls	40%	1033	37%	909
2053	SH6A	47%	1466	48%	1384
	Shotover Bridge	34%	772	35%	869
	Kawarau Falls	53%	1687	49%	1489

5.2 The following was noted by WSP:

- These are the target PT shares that result in the pinch points operating at 90% volume/capacity ratio for general traffic. The PT model estimates PT patronage (and PT mode share levels) at much lower levels than these predictions – as traffic still continues to flood the network (due to availability of parking, poor access to PT for some trips etc).

Hence, these values are very much aspirational targets, but as above are linked to the level required to maintain under capacity operation of the road network.

- As the suite of modelling tools only has car-based, bus and ferry modes, the PT patronage quoted in the table below also includes active mode trips (as it effectively is measured as the non-car mode). WSP noted that these are likely to be only 5-10% of the PT patronage, but this adjustment could be made.
- Also, the modelling suite is a fixed demand matrix, so there is no (or little) account of any temporal effects such as peak spreading and trip suppression; or any behavioural effects such as trip chaining due to congestion – so again, the overall demand could be considered worst case in the peak hour periods.
- The above was based on demand sets (from the QLDC Tracks model) with a maximum number of residences on Ladies Mile of 1,100. Mode share targets could therefore be higher with TPLM Masterplan.

6 Updated Transport Modelling

6.1 Background

6.1.1 Attached is the Technical Note (Rev A dated 21/9/23) prepared by Abley consultants on behalf of Waka Kotahi outlining the updated modelling work carried out for TPLM.

6.1.2 The results are presented in this Technical Memo in terms of:

- Comparison of results for 2053 base model (without TPLM) with 2053 base model (with TPLM) - to assess the overall impacts of the TPLM Masterplan on the adjacent transport network.
- Comparison of results for 2053 base model with TPLM pre and post Public Transport (PT) modelling- to assess the effects that the model predicted PT modal share will have.

6.1.2 The following modelling information was supplied:

- Strategic Model outputs in the form of a spreadsheet of results issued 13 September (file name Ladies Mile Revised Modelling inputs and outputs 12 Sep 2023 with skims.xlsx) and subsequent clarification emails.
- PT model outputs in the form of a spreadsheet of results issued 14 September (file name Output Summary.xlsx) and subsequent clarification emails.
- Strategic Model outputs in the form of a spreadsheet of results issued 14 September (file name Distribution of LM Traffic by origin destination summary.xlsx) and subsequent clarification emails.

6.1.3 The modelling refers to pre PT modelling as ‘pre PT skim’ and post PT modelling as ‘post PT skim’.

6.1.4 As noted in the Transport Strategy, the results from the Strategic Model and PT model are considered to be conservative since they do not take into account mode shift arising from the proposed TPLM active mode, travel behaviour change or Transport Demand Measures.

6.2 Comparison of 2053 base with and without TPLM predicted vehicle flows

6.2.1 Flow comparison (with PT mode shift)

A comparison of the 2053 with and without TPLM traffic flows (both post PT skim) is summarised below (worksheets 10 and 16 of outputs issued 13/9/23):

2053 base model flows (no TPLM) with TPLM

Location	AM peak	IP	PM peak
Shotover Bridge westbound (to Queenstown)	1494 1581	1233 1350	1227 1235
Shotover Bridge eastbound (from Queenstown)	968 1005	1300 1388	1630 1710
Stalker Rd northbound	364 361	196 217	197 200
Stalker Rd southbound	123 120	195 198	385 391
SH6 (between Howards Dr and Stalker Rd) westbound	1169 1028	1021 972	1040 931
SH6 (between Howards Dr and Stalker Rd) eastbound	843 799	1096 1054	1284 1115
Howards Drive northbound	459 467	301 277	314 321
Howards Drive southbound	219 232	299 293	502 509
SH6 (Howards Dr and Eastern roundabout) westbound	813 741	805 716	976 895
SH6 Howards Dr and Eastern roundabout) eastbound	793 726	885 794	954 866
SH6 (McDowell Dr and Eastern roundabout) westbound	791 769	792 797	976 1024
SH6 (McDowell Dr and Eastern roundabout) eastbound	784 815	872 879	938 923
Total Lake Hayes Estate and Shotover Country (Stalker Rd plus Howards Drive)	1165 1404	991 1054	1398 1673

The results indicate that the Shotover Bridge will be operating within capacity for the AM, IP and PM peaks for the 2053 base year both with and without TPLM. The exception is the PM peak eastbound with TPLM, which will be very marginally above capacity (only by 10 vehicles).

Therefore, it is considered that the 2053 base model predictions (both with and without TPLM) indicate that there would not be any link capacity issues with TPLM and the proposed public transport measures on the surrounding transport network.

6.2.2 Flow comparison (without PT mode shift)

A comparison of the 2053 with and without TPLM traffic flows (both pre PT skim) is summarised below (worksheets 7 and 13 of outputs issued 13/9/23 plus as noted in the Abley email 25 September 2023 corrections to the model as reported in Appendix A1 to A3 of the Abley Technical Note):

2053 base model flows (no TPLM) with TPLM

Location	AM peak	IP	PM peak
Shotover Bridge westbound (to Queenstown)	1667 1814	1285 1441	1315 1340
Shotover Bridge eastbound (from Queenstown)	1054 1111	1338 1477	1780 1923
Stalker Rd northbound	457 459	211 234	220 220
Stalker Rd southbound	135 131	207 212	485 495
SH6 (between Howards Dr and Stalker Rd) westbound	1294 1144	1052 1023	1097 980
SH6 (between Howards Dr and Stalker Rd) eastbound	887 850	1120 1105	1379 1193
Howards Drive northbound	545 557	317 297	344 357
Howards Drive southbound	240 257	313 311	592 601
SH6 (Howards Dr and Eastern roundabout) westbound	819 751	813 727	1006 915
SH6 (Howards Dr and Eastern roundabout) eastbound	821 751	887 798	920 828
SH6 (McDowell Dr and Eastern roundabout) westbound	788 758	798 807	1003 1044
SH6 (McDowell Dr and Eastern roundabout) eastbound	811 843	873 880	894 861
Total Lake Hayes Estate and Shotover Country (Stalker Rd plus Howards Drive)	1367 1404	1048 1054	1641 1673

The results indicate that:

- The Shotover Bridge will be operating within capacity for the AM, IP and PM peaks for the 2053 base year without TPLM except for the PM peak eastbound, which will be above capacity by 80 vehicles.
- The Shotover Bridge will be operating within capacity for the AM, IP and PM peaks for the 2053 base year with TPLM except for the AM peak westbound, which will be above capacity by 114 vehicles and PM peak eastbound, which will be above capacity by 223 vehicles.

Therefore, it is considered that the 2053 base model predictions (both with and without TPLM) demonstrate the need for public transport investment to achieve mode shift and an operational transport network as set out by the W2G partners and as set out in the TPLM Masterplan and Variation.

6.3 2053 Base Model plus TPLM and public transport modelling

6.3.1 Distribution of TPLM trips (post PT skim)

The model predicts the following distribution of AM and PM peak trips:

AM Peak from TPLM to:

- Wakatipu Basin = 19%
- East of Wakatipu Basin = 6%
- Frankton = 28%
- Lake Hayes Estate = 4%
- Shotover Country = 3%
- Internal TPLM = 27%
- SH6 South of Kawarau Falls Bridge = 1%
- SH6A west of BP roundabout = 12%

AM Peak to TPLM from:

- Wakatipu Basin = 15%
- East of Wakatipu Basin = 8%
- Frankton = 17%
- Lake Hayes Estate = 6%
- Shotover Country = 7%
- Internal TPLM = 34%
- SH6 South of Kawarau Falls Bridge = 7%
- SH6A west of BP roundabout = 5%

PM Peak from TPLM to:

- Wakatipu Basin = 16%
- East of Wakatipu Basin = 7%
- Frankton = 20%
- Lake Hayes Estate = 6%
- Shotover Country = 6%
- Internal TPLM = 38%
- SH6 South of Kawarau Falls Bridge = 3%
- SH6A west of BP roundabout = 5%

PM Peak to TPLM from:

- Wakatipu Basin = 19%
- East of Wakatipu Basin = 9%
- Frankton = 25%
- Lake Hayes Estate = 4%
- Shotover Country = 3%
- Internal TPLM = 32%
- SH6 South of Kawarau Falls Bridge = 2%
- SH6A west of BP roundabout = 7%

As expected, with the mixed use high density TPLM Masterplan, the model predicts a large number (27% to 38%) of all TPLM trips to remain internal to the site. Key destinations for external trips include the adjacent Basin areas, Frankton and Queenstown CBD.

6.3.2 TPLM mode share by destination

Information provided from the PT model indicates in terms of the key origin and destination of trips from TPLM, that:

- To Queenstown Centre, 49% of all trips would be by bus in the AM peak.
- To Frankton, 24% of all trips would be by bus in the AM peak.
- From Queenstown, 49% of all trips would be by bus in the AM peak.
- From Frankton, 30% of all trips would be by bus in the AM peak.

Therefore, for the key destinations to/from TPLM the model predicts a 24% to 49% public transport modal share.

6.3.3 Predicted bus flows and mode shares

Information provided from the PT model indicates the following 2053 base plus TPLM bus passenger flows:

Location	AM	IP	PM
Shotover bridge westbound	559	129	142
Shotover bridge eastbound	112	154	582
Shotover bridge total	671	283	724
TPLM in	103	108	328
TPLM out	283	88	117
TPLM Total	386	196	445
Lake Hayes Estate/ Shotover Country In	54	54	286
Lake Hayes Estate/ Shotover Country Out	269	51	79
Lake Hayes Estate/ Shotover Country total	323	105	365

The model predicted external vehicle trip totals (post PT skim) for TPLM (worksheet 9 of outputs issued 13/9/23) are summarised below:

	In	Out	Total
AM peak	578	786	1364
IP	658	681	1339
PM peak	968	718	1686

Comparing the predicted modelled bus trips with the above vehicle trips, indicates the model is predicting the following bus mode share for TPLM external trips:

- AM peak = 22%
- IP = 13%
- PM peak = 21%.

For the reasons outlined in the Transport Strategy, this is considered to be an underestimate of the expected non car mode share at TPLM since it does not take into account mode shift arising for example, from the proposed TPLM Variation and W2G partners active mode, Travel Behaviour Change or Transport Demand Measures.

However, the model indicates that even with this lower PT mode share, that there will be limited capacity issues on the adjacent road network.

Lake Hayes Estate/Shotover Country

Comparing the predicted modelled bus trips above, with the vehicle trips indicated in section 6.2.1 above for the 2053 base with TPLM, indicates the model is predicting the following bus mode share for Lake Hayes Estate/Shotover Country external trips:

- AM peak = 19%
- IP = 9%
- PM peak = 18%.

This is a substantially greater bus mode share than currently exists at Lake Hayes Estate and Shotover Country. The model demonstrates that with public transport investment by W2G partners and with the TPLM Masterplan, mode shift can be achieved at Lake Hayes Estate and Shotover Country.

Shotover Bridge

Comparing the predicted modelled bus trips above, with the vehicle trips indicated in section 6.2.1 above for the 2053 base with TPLM, indicates the model is predicting the following bus mode share across the Shotover Bridge:

- AM peak = 21%
- IP = 9%
- PM peak = 20%.

This is a substantially greater bus mode share than currently exists across the Shotover Bridge. The model demonstrates that with public transport investment by W2G partners and with the TPLM Masterplan, mode shift can be achieved across the Shotover bridge with the model predicting that the bridge will work at capacity at 2053 with TPLM with public transport investment. It should also be noted that the 2053 base model plus TPLM predicted bus trips are very close to the targets set

within the ORC PTDBC set out in Section 6 above of 772/869 bus passengers on Shotover bridge for the bridge to operate at 90% volume/capacity ratio for general traffic.

As noted in section 6, the modelling suite is a fixed demand matrix, so there is no (or little) account of any temporal effects such as peak spreading and trip suppression; or any behavioural effects such as trip chaining due to congestion. Therefore, the overall demand could be considered worst case in the peak hour periods.

7 Sidra modelling of SH6/Stalker Road/Lower Shotover Road/TPLM access intersection and SH6/Howards Drive/TPLM access intersection

7.1 Background

As requested by Waka Kotahi, Sidra capacity assessments were undertaken at the SH6/Stalker Road/Lower Shotover Road roundabout and SH6/Howards Drive NZUP roundabout. Reference is made below to Worksheet 11 (WS11) from the information received 13 September 2023.

7.2 SH6/Stalker Road/Lower Shotover Road roundabout

Sidra assessment was undertaken for the existing roundabout layout (including the proposed NZUP bus lane) using:

- Existing turning flows (based on 2018 turning counts from section 3.6 of the Transport Strategy).
- 2053 base with TPLM post PT skim (WS11) turning flows. The TPLM access was assumed to be combined with the Lower Shotover Road access.

7.3 SH6/Howards Drive roundabout

Sidra assessment was undertaken using NZUP roundabout layout (Drawing No. KHT-NZU-DZ1-LD-DG-1002 Rev D) using:

- Existing turning flows (based on 2018 turning counts from section 3.6 of the Transport Strategy) assessed without TPLM traffic flows.
- 2053 with TPLM post PT skim (WS11) turning flows.

7.4 Calibration of roundabout models for existing situation

With the existing westbound queues on SH6 in the AM peak between Shotover Bridge and east of Howards Drive, the existing Sidra models at both intersections were calibrated against the queue length surveys (from Section 3.11 of the Transport Strategy), in order to give a more accurate assessment of the existing performance of both intersections. The calibration was achieved by

adjusting the value for "Capacity Adjustment" of affected traffic lanes to a negative value until similar queue lengths to the site observations was achieved.

Since there are no queues in the PM then this was not required for the existing PM peak.

7.5 AM peak existing traffic results

The outputs from Sidra (before calibration) for the existing traffic are summarised in Table 7.1 and Table 7.2 below:

Table 7.1: Sidra modelling uncalibrated outputs AM peak – existing SH6/Stalker Road/Lower Shotover Road roundabout

Approach	Lane	Average Delay (secs)	Level of Service (LoS)	95th %tile back of queue (vehicles)*
Stalker Road	One lane, all directions	205.3	F	58
SH6 East	Through and left-turn lane	7.2	A	0
	Through and right-turn lane	10.4	B	12
Lower Shotover Road	One lane, all directions	12.9	B	1
SH6 West	Through and left-turn lane	6.3	A	2
	Through and right-turn lane	7.7	A	2

Note: *Rounded to the nearest integer (except 0).

Table 7.2: Sidra modelling uncalibrated outputs AM peak –SH6/Howards Drive NZUP roundabout

Approach	Lane	Average Delay (secs)	LoS	95th %tile back of queue (vehicles)*
Howards Drive	Left-turn lane	4.8	A	2
	Through and right-turn lane	9.1	A	1
SH6 East	Through and left-turn lane	9.6	A	1
	Through and right-turn lane^	8.2	A	2
TPLM Access	All directions^	3.9	A	0

SH6 West	Through and left-turn lane	8.0	A	2
	Right-turn lane	14.2	B	1

Note: ^The default and minimum sidra value input of traffic volume is 1 per hour and cannot be 0. The impact of the TPLM approach on the modelling result is considered to be negligible.
*Rounded to the nearest integer.

As shown in Tables 7.1 and 7.2, the LoS is A or B ,with small delays and queue lengths in most lanes for all approaches (except Stalker Road). This does not reflect the observations from the queue survey. Therefore, Table 7.3 and Table 7.4 below show the capacity adjustments applied to the roundabout for the AM peak:

Table 7.3: Capacity adjustments applied in AM peak – SH6/Stalker Road/Lower Shotover Road

Approach	Lane	Capacity adjustments*
Stalker Road	Roundabout: one lane, all directions	-22.5%
SH6 East	Roundabout: both westbound lanes	-30.8% in each lane

Note: *Negative indicates reduced capacity.

Table 7.4: Capacity adjustments applied in AM peak –SH6/Howards Drive NZUP roundabout

Approach	Lane	Capacity adjustments*
Howards Drive	Roundabout: left-turn lane	-76.5%
SH6 East	Roundabout: both westbound lanes	-74.5% in each lane

Note: *Negative indicates reduced capacity.

The outputs from Sidra after calibration, are summarised Table 7.5 and Table 7.6 below:

Table 7.5: Sidra modelling calibrated outputs AM peak – existing SH6/Stalker Road/Lower Shotover Road roundabout

Approach	Lane	Average delay (secs)	LoS	95th %tile back of queue (vehicles)*
Stalker Road	One lane, all directions	341.6	F	85
SH6 East	Through and left-turn lane	7.2	A	1
	Through and right-turn lane	145.2	F	103

Lower Shotover Road	One lane, all directions	12.9	B	1
SH6 West	Through and left-turn lane	6.2	A	2
	Through and right-turn lane	7.6	A	3

Note: *Rounded to the nearest integer.

Table 7.6: Sidra modelling calibrated outputs AM peak –SH6/Howards Drive NZUP roundabout

Approach	**Lane**	**Average delay (secs)**	**LoS**	**95th %tile back of queue (vehicles)***
Howards Drive	Left-turn lane	404.8	F	72
	Through and right-turn lane	8.7	A	1
SH6 East	Through and left-turn lane	9	A	1
	Through and right-turn lane^	240.9	F	75
TPLM Access	All directions^	3.9	A	0
SH6 West	Through and left-turn lane	8.0	A	2
	Right-turn lane	14.2	B	1

Note: ^The default and minimum sidra value input of traffic volume is 1 per hour and cannot be 0.

As shown in the modelling results, with calibration, the LoS reduces to F on Stalker Road and Howards Drive and on the westbound lanes on SH6 approaches. The 95th %tile back of queue also increases and is comparable to the observed queue lengths.

7.6 AM peak 2053 base plus TPLM after PT modelling

The results for SH6/Stalker Road/Lower Shotover Road/TPLM roundabout AM peak with the 2053 base plus TPLM (post PT skim WS11) including existing calibration are summarised in Table 7.7 below:

Table 7.7: Sidra modelling calibrated outputs AM peak –SH6/Stalker Road/Lower Shotover Road/TPLM roundabout 2053 plus TPLM post PT skim

Approach	Lane	Average delay (secs)	LoS	95th %tile back of queue (vehicles)*
Stalker Road	One lane, all directions	107.8	F	28
SH6 East	Through and left-turn lane	8.8	A	0
	Through and right-turn lane	373.5	F	209
Lower Shotover Road/TPLM	One lane, all directions	15.5	B	2
SH6 West	Through and left-turn lane	7.1	A	2
	Through and right-turn lane	7.2	A	4

Compared to the existing calibrated situation (Table 7.5 above), delays and queue lengths on SH6 will increase in the 2053 base plus TPLM scenario. This assumes the same level of calibration used to model the existing situation.

For the 2053 base scenario with TPLM, public transport improvements as modelled by the PT model, will result in mode shift from both TPLM and the adjacent communities. Therefore, applying the existing calibration is not considered appropriate for the future scenario with public transport improvements and mode shift across the bridge. Table 7. 8 below presents the results for the 2053 base plus TPLM without the calibration applied:

Table 7.8: Sidra modelling outputs AM peak – existing SH6/Stalker Road/Lower Shotover Road/TPLM roundabout 2053 plus TPLM post PT skim (without calibration)

Approach	Lane	Average delay (secs)	LoS	95th %tile back of queue (vehicles)*
Stalker Road	One lane, all directions	449.5	F	87
SH6 East	Through and left-turn lane	9.5	A	0
	Through and right-turn lane	32.0	C	35
Lower Shotover Road	One lane, all directions	15.5	B	2
SH6 West	Through and left-turn lane	7.1	A	2
	Through and right-turn lane	7.2	A	4

Table 7.8 indicates that queues and delays on SH6 East are predicted to be lower in the scenario without the calibration capacity reduction, although they are predicted to be slightly higher on Stalker Road. As identified in the Transport Strategy, the preference would be to introduce traffic signal control at this intersection to improve operational performance and introduce controlled crossings for pedestrians and cyclists.

The results from the assessment of SH6/Howards Drive/TPLM access roundabout AM peak 2053 base plus TPLM (post PT skim WS11) including existing calibration are summarised in Table 7.9 below:

Table 7.9: Sidra modelling calibrated outputs AM peak –SH6/Howards Drive/TPLM NZUP roundabout 2053 plus TPLM post PT skim

Approach	Lane	Average delay (secs)	LoS	95th %tile back of queue (vehicles)*
Howards Drive	Left-turn lane	158.9	F	22
	Through and right-turn lane	5.5	A	2
SH6 East	Through and left-turn lane	160.0	F	28
	Through and right-turn lane	609.2	F	132
TPLM Access	All directions	7.5	A	3
SH6 West	Through and left-turn lane	9.3	A	5
	Right-turn lane	15.6	B	1

Compared to the existing calibrated situation (Table 7.6 above), delays and queue lengths on SH6 East will increase in the 2053 base plus TPLM scenario. This assumes the same level of calibration used to model the existing situation.

For the 2053 base scenario with TPLM, public transport improvements as modelled by the PT model, will result in mode shift from both TPLM and the adjacent communities. Therefore, applying the existing calibration is not considered appropriate for the future scenario with public transport improvements and mode shift across the bridge. Table 7. 10 below presents the results for the 2053 base plus TPLM without the calibration applied:

Table 7.10: Sidra modelling outputs AM peak –SH6/Howards Drive/TPLM NZUP roundabout 2053 plus TPLM post PT skim (without calibration)

Approach	Lane	Average delay (secs)	LoS	95th %tile back of queue (vehicles)*
Howards Drive	Left-turn lane	7.0	A	2
	Through and right-turn lane	6.4	A	2
SH6 East	Through and left-turn lane	11.2	B	2
	Through and right-turn lane^	9.8	A	3
TPLM Access	All directions	7.5	A	3
SH6 West	Through and left-turn lane	9.5	A	5
	Right-turn lane	15.7	B	1

The results from this assessment indicates that the roundabout intersection would be working within capacity. As identified in the Transport Strategy, the preference though would be to introduce traffic signal control at this intersection to introduce controlled crossings for pedestrians and cyclists.

7.7 PM Peak existing results

The outputs from Sidra are summarised in Table 7.10 and Table 7.2 below for both roundabouts:

Table 7.10: Sidra modelling outputs PM peak –SH6/Stalker Road/Lower Shotover Road roundabout

Approach	Lane	Average delay (secs)	LoS	95th %tile back of queue (vehicles)*
Stalker Road	One lane, all directions	9.8	A	3
SH6 East	Through and left-turn lane	8.3	A	0
	Through and right-turn lane	11.4	B	8
Lower Shotover Road	One lane, all directions	14.8	B	2
SH6 West	Through and left-turn lane	7.6	A	3
	Through and right-turn lane	8.2	A	5

Note: *Rounded to the nearest integer.

Table 7.7: Sidra modelling outputs PM peak – proposed SH6/Howards Drive roundabout

Approach	Lane	Average delay (secs)	LoS	95th %tile back of queue (vehicles)*
Howards Drive	One lane, all directions	3.4	A	1
SH6 East	Through and left-turn lane	9.2	A	0
	Through and right-turn lane	9.9	A	1
TPLM access	One lane, all directions	9.3	A	2
SH6 West	Through and left-turn lane	5.4	A	0
	Through and right-turn lane	7.8	A	3

Note: *Rounded to the nearest integer.

The results indicate that both intersections are working within capacity for the existing situation.

7.8 PM peak 2053 base plus TPLM after PT modelling

The results for both roundabouts in the PM peak with the 2053 base plus TPLM (post PT skim WS11) are summarised in Table 7.12 and 7.13 below:

Table 7.8: Sidra modelling outputs PM peak –SH6/Stalker Road/Lower Shotover Road/TPLM access roundabout

Approach	Lane	Average delay (secs)	LoS	95th %tile back of queue (vehicles)*
Stalker Road	One lane, all directions	17.9	B	4
SH6 East	Through and left-turn lane	10.0	A	0
	Through and right-turn lane	32.8	C	30
Lower Shotover Road/TPLM	One lane, all directions	19.8	B	3
SH6 West	Through and left-turn lane	7.6	A	5
	Through and right-turn lane	8.2	A	10

Note: *Rounded to the nearest integer.

Table 7.9: Sidra modelling outputs PM peak – proposed SH6/Howards Drive/TPLM access roundabout

Approach	Lane	Average delay (secs)	LoS	95th %tile back of queue (vehicles)*
Howards Drive	Left-turn lane	7.5	A	1
	Through and right-turn lane	7.3	A	2
SH6 East	Through and left-turn lane	12.4	B	3
	Through and right-turn lane^	14.0	B	6
TPLM Access	All directions	13.8	B	6
SH6 West	Through and left-turn lane	12.5	B	11
	Right-turn lane	16.3	B	2

Note: *Rounded to the nearest integer.

The results indicate that both intersections are working within capacity for the existing situation.

Abley Technical Note

Te Pūtahi Ladies Mile Plan Change Modelling

Technical Note

Prepared for	Waka Kotahi NZ Transport Agency; Queenstown-Lakes District Council
Job Number	NZTA-J321
Revision	B
Issue Date	27 September 2023
Prepared by	Regan Toogood, Graduate Transportation Modeller; Dave Smith, Technical Director
Reviewed by	Dave Smith, Technical Director

1. Introduction

Queenstown-Lakes District Council have prepared a Plan Change application to establish Te Pūtahi Ladies Mile Zone. Abley have been commissioned by Waka Kotahi NZ Transport Agency (Waka Kotahi) to review the Transport Strategy lodged as part of the Plan Change application. Subsequent to this review, Abley and Waka Kotahi have engaged with the Council team and agreed that the transportation modelling presented in the Transport Strategy should be updated to inform the Ladies Mile Plan Change.

Modelling has previously been completed by Abley as an input to the development of a Transport Strategy for the Ladies Mile Masterplan. This was undertaken in 2020/21 using the Queenstown-Lakes Tracks Transportation Model (Tracks Model) with the results documented in an Abley document "Ladies Mile Masterplan Transportation Modelling: Technical Note" dated 17 March 2021 and attached to the Transport Strategy as Appendix F. The modelling focused on a base year of 2016 and future year of 2048 based on the most recently available development and infrastructure planning forecasts at the time. In terms of process the Tracks model was run with no mode shift, the results were then passed to WSP who run a bespoke Public Transport model and returned a vehicle driver skim matrix which implements the mode shift based on improved public transport provision and infrastructure. The Tracks model was then re-run with the mode shift away from vehicle driver trips removed from the vehicle assignment.

The modelling presented in this technical note has been completed using the most recently updated Tracks model with a based year of 2022 and future year of 2053. The underlying future land use forecasts were most recently updated within the model in August 2022 based on growth forecasts supplied by Queenstown-Lakes District Council. The results presented correspond to the future 2053 base model from the August 2022 growth forecasts and a scenario which aligns with the level of development anticipated by the Ladies Mile Plan Change. The specification of the modelling assumptions and outputs have been agreed collaboratively between Colin Shields and Dave Smith (who have been engaged by Council and Waka Kotahi respectively).

2. Modelling scenarios

The modelled scenarios are as follows:

1. 2053 Base Model (Base Model) – developed based on Council growth forecasts and include 1044 Households and 764 Jobs in the Ladies Mile zones

2. 2053 with Ladies Mile Plan Change (LM Model) – 2053 Base Model but scaled up to include 2411 Households and 964 Jobs in the Ladies Mile zones

The base model was prepared in August 2022 and reflects the growth forecasts signed off by Council at the time. As such they include some development on the Ladies Mile block and are not consistent with a 'without development' or 'permitted baseline' scenario. Regardless they are the current set of endorsed models to inform transport planning across the Queenstown-Lakes District as of August 2022.

All scenarios assume that 90% of Ladies Mile households are occupied by residents with the remaining 10% of households being holiday homes. This proportion has been calibrated from the 2018 census data corresponding to the Shotover Country and Lake Hayes Estate statistical areas. The total number of households included in each zone are as shown in the following table.

Table 2.1 Ladies Mile Land Use Summary by Tracks Zone

Tracks Zone	Base Model		Ladies Mile Model	
Zone	Households	Jobs	Households	Jobs
217	117	32	128	0
270	30	30	389	0
271	84	68	520	904
272	76	46	1264	60
273	737	588	110	0
Total	**1044**	**764**	**2411**	**964**

The base model road network does not include the Ladies Mile structure plan but instead feeds the majority of traffic generated on Ladies Mile being in zone 273 which feeds into a new road which forms a fourth leg at the Howards Drive intersection. A smaller amount of traffic feeds from zones 270-272 onto the Springbank Grove and McDowell Drive. This is shown in Figure 2.1.

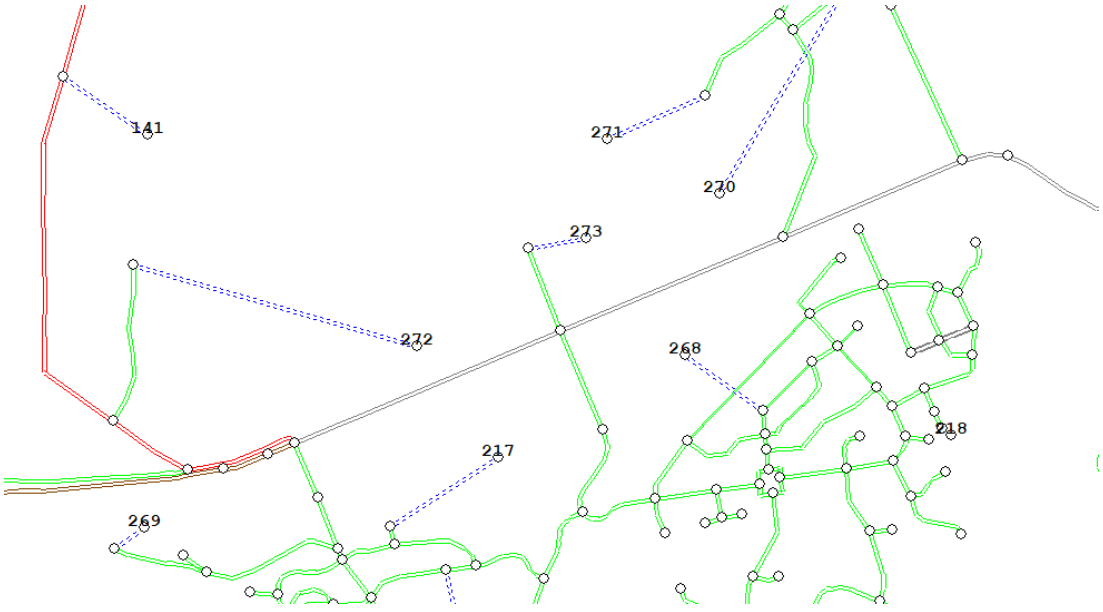


Figure 2.1 Base Model Road Network

The road network layout for LM Model is shown in Figure 2.2 with the Ladies Mile residential activity for the base and Option 1 loaded into zones 270, 271 and 272. Zone 217 has minor changes under the Ladies Mile Master Plan. Zone 270 and 273 are residential only, whilst zones 271 and 272 are mixed residential and commercial, with the majority of commercial activity for the Ladies Mile area being in zone 271. Roundabouts have been modelled at each of the three connections to SH6. The three accesses to the development (highlighted below) from left to right will be referred to as:

- Lower Shotover Rd Access
- Howards Dr Access
- Eastern Access

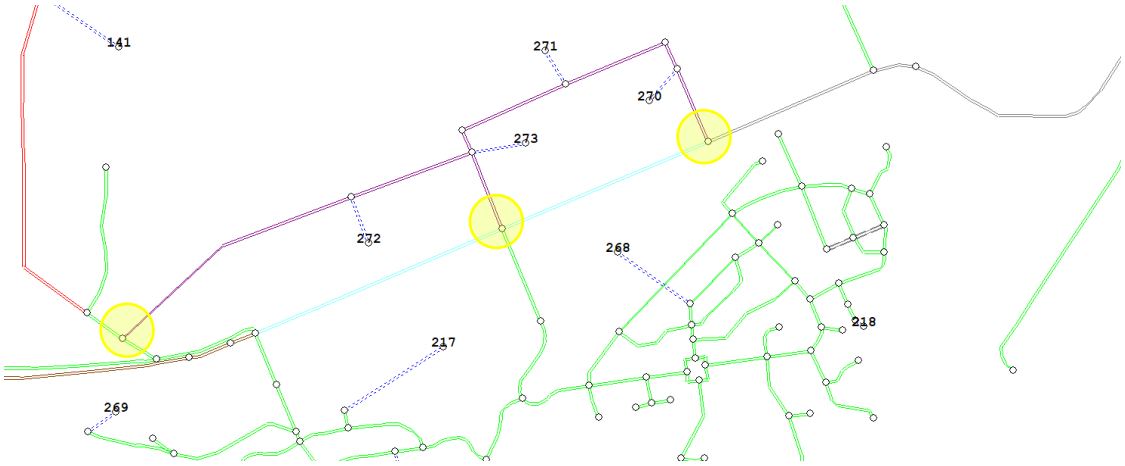


Figure 2.2 Ladies Mile Model Road Network

Additionally, there are 3 public transport routes that will service the development taken from the Transport Strategy document operating at 10 minute frequency throughout the day. These routes are shown in Figure 2.3.

Figure 2.3 Ladies Mile Model Public Transport Network

2.1 Report nomenclature

For clarity, a list of acronyms/ common phrases used throughout the report and their meanings are given in Table 2.2

Table 2.2 Nomenclature used throughout report

Acronym/ Phrase	Meaning
Basin	The Wakatipu Basin area outside of the Ladies Mile
E of Basin	All areas east via the Crown Range and Kawarau Gorge
Frk	The wider Frankton area north of Kawarau River and west of Shotover River
LHE	Lake Hayes Estate
LMMP	Ladies Mile Masterplan areas
SC	Shotover Country
SofKwBdg	Areas south of the Kawarau River crossing on SH6
WofBp	Areas accessed by SH6A and beyond west of the BP roundabout
Base model	The 2053 model with 1044 households on Ladies Mile development
LM model	The 2053 model with the Ladies Mile development

3. Pre-Skim Totals

The peak hour matrices from the Tracks model have been analysed and sectored so the trip distribution can be understood outside of the Ladies Mile Area. There are eight areas of the model study area that have been defined to capture the trip patterns as follows:

- Basin – the Wakatipu Basin area outside of the Ladies Mile
- E of Basin – All areas east via the Crown Range and Kawarau Gorge
- Frk – The wider Frankton area north of Kawarau River and west of Shotover River
- LHE – Lake Hayes Estate
- LMMP – Ladies Mile Masterplan areas
- SC – Shotover Country
- SofKwBdg – areas south of the Kawarau River crossing on SH6.
- WofBP – areas accessed by SH6A and beyond west of the BP roundabout.

The results in this section are presented as a table of trips to and from Ladies Mile. The tables in this section are for the 2053 morning peak hour first showing the base model then LM model and following on from this is the 2053 evening peak hour in the same order. They represent the pre-skim scenario once the trip generation and distribution modules have been run and the model has achieved convergence. They also represent the number of vehicle trips.

Table 3.1 Base model AM peak pre-skim trip distribution

From	To LM	%		To	From LM	%
Basin	83	20%		Basin	126	20%
E of Basin	38	9%		E of Basin	31	5%
Frk	89	21%		Frk	217	34%
LHE	36	8%		LHE	27	4%
LMMP	71	17%		LMMP	71	11%
SC	39	9%		SC	24	4%
SofKwBdg	44	10%		SofKwBdg	8	1%
WofBp	26	6%		WofBp	129	20%
Total	**426**	**100%**		**Total**	**633**	**100%**

Table 3.2 LM model AM peak pre-skim trip distribution

From	To LM	%		To	From LM	%
Basin	145	15%		Basin	234	17%
E of Basin	76	8%		E of Basin	64	5%
Frk	172	18%		Frk	393	29%
LHE	64	7%		LHE	47	3%
LMMP	302	32%		LMMP	302	22%
SC	68	7%		SC	44	3%
SofKwBdg	70	7%		SofKwBdg	13	1%
WofBp	51	5%		WofBp	246	18%
Total	**949**	**100%**		**Total**	**1344**	**100%**

Table 3.3 Base model PM peak pre-skim trip distribution

From	To LM	%		To	From LM	%
Basin	137	21%		Basin	116	21%
E of Basin	53	8%		E of Basin	47	9%
Frk	222	33%		Frk	143	26%
LHE	28	4%		LHE	48	9%
LMMP	82	12%		LMMP	82	15%
SC	25	4%		SC	44	8%
SofKwBdg	14	2%		SofKwBdg	28	5%
WofBp	102	15%		WofBp	40	7%
Total	**663**	**100%**		**Total**	**548**	**100%**

Table 3.4 LM model PM peak pre-skim trip distribution

From	To LM	%		To	From LM	%
Basin	277	17%		Basin	201	16%
E of Basin	126	8%		E of Basin	87	7%
Frk	465	28%		Frk	270	21%
LHE	62	4%		LHE	85	7%
LMMP	456	28%		LMMP	456	36%
SC	54	3%		SC	76	6%
SofKwBdg	23	1%		SofKwBdg	36	3%
WofBp	194	12%		WofBp	74	6%
Total	**1657**	**100%**		**Total**	**1285**	**100%**

Summaries of the pre-skim traffic entering and exiting the development for the AM, IP and PM peak are shown in Table 3.5, Table 3.6, Table 3.7 respectively.

Table 3.5 LM Model AM peak pre-skim access summary

Access Name	In	Out	Total
Lower Shotover Rd Access	102	359	**461**
Howards Dr Access	409	403	**812**
Eastern Access	144	228	**372**
Total	**655**	**990**	**1645**

Table 3.6 LM Model IP peak pre-skim access summary

Access Name	In	Out	Total
Lower Shotover Rd Access	167	160	**327**
Howards Dr Access	399	402	**801**
Eastern Access	170	173	**343**
Total	**736**	**735**	**1471**

Table 3.7 LM Model PM peak pre-skim access summary

Access Name	In	Out	Total
Lower Shotover Rd Access	402	154	**556**
Howards Dr Access	508	451	**959**
Eastern Access	295	199	**494**
Total	**1205**	**804**	**2009**

4. Public Transport Model

4.1 General

The WSP PT model has been to estimate the capture rate (or mode share) of public transport modes, given the future trip levels in 2053, by creating a “skim” of PT trips from the overall trip demand. The input to the model is the “pre-skim” travel demand matrices from Tracks, with the output being the “post-skim” matrices (i.e. once PT trips have been removed) – these remaining trips are assumed to be private-vehicle trips, and are assigned onto the network within the Tracks model.

4.2 Application to Ladies Mile Masterplan

The PT model assumes:

- No Park and Ride spaces at Ladies Mile or Alec Robins Road
- 10-minute frequency on service 2 (Arrowtown to Queenstown Town Centre)
- 10-minute frequency on service 5 (Lake Hayes Estate to Queenstown Town Centre) in each direction

Outputs from the model are included in Appendix B and are as follows:

a) Bus, ferry and car percentage mode share by sector and period (nine tables)

b) Bus patronage on key corridors by period (three figures)

c) Mode share at key locations by period (one table)

5. Trip Assignment Post-Skim

The pre skim matrices are provided to WSP as an input to the PT model process of which an output is the number of trips to be removed from the pre-skim matrices that have transferred to public transport. This is fed into the Tracks model as a matrix to remove these trips and allowing the Tracks model to be reassigned with mode shift applied to account for appropriate PT demand in terms of the number of vehicular trips removed.

The matrices in this section are for the 2053 morning peak hour first showing the base model then LM model and following on from this is the 2043 evening peak hour in the same order representing the post-skim scenario. They also represent the total number of private vehicle trips.

Table 5.1 Base model AM peak post-skim trip distribution

From	To LM	%		To	From LM	%
Basin	76	20%		Basin	117	22%
E of Basin	37	9%		E of Basin	30	6%
Frk	78	20%		Frk	184	34%
LHE	31	8%		LHE	24	4%
LMMP	70	18%		LMMP	70	13%
SC	34	9%		SC	21	4%
SofKwBdg	41	11%		SofKw Bdg	8	2%
WofBp	23	6%		WofBp	82	15%
Total	**390**	**100%**		**Total**	**537**	**100%**

Table 5.2 LM model AM peak post-skim trip distribution

From	To LM	%		To	From LM	%
Basin	132	15%		Basin	218	19%
E of Basin	73	8%		E of Basin	62	6%
Frk	146	17%		Frk	317	28%
LHE	54	6%		LHE	40	4%
LMMP	301	34%		LMMP	301	27%
SC	58	7%		SC	38	3%
SofKwBdg	65	7%		SofKw Bdg	13	1%
WofBp	44	5%		WofBp	140	12%
Total	**874**	**100%**		**Total**	**1130**	**100%**

Table 5.3 Base model PM peak post-skim trip distribution

From	To LM	%		To	From LM	%
Basin	128	23%		Basin	108	21%
E of Basin	52	9%		E of Basin	46	9%
Frk	182	32%		Frk	127	25%
LHE	24	4%		LHE	43	8%
LMMP	82	14%		LMMP	82	16%
SC	22	4%		SC	39	8%
SofKwBdg	14	2%		SofKw Bdg	27	5%
WofBp	63	11%		WofBp	33	7%
Total	**567**	**100%**		**Total**	**504**	**100%**

Table 5.4 LM model PM peak post-skim trip distribution

From	To LM	%		To	From LM	%
Basin	259	18%		Basin	187	16%
E of Basin	123	9%		E of Basin	85	7%
Frk	354	25%		Frk	235	20%
LHE	53	4%		LHE	73	6%
LMMP	456	32%		LMMP	456	38%
SC	46	3%		SC	66	6%
SofKwBdg	22	2%		SofKwBdg	35	3%
WofBp	105	7%		WofBp	59	5%
Total	**1419**	**100%**		**Total**	**1196**	**100%**

Summaries of traffic entering or exiting the Ladies Mile development for the AM, IP and PM peak and shown in Table 5.5, Table 5.6, Table 5.7 respectively.

Table 5.5 LM Model AM peak post-skim access summary

Access Name	In	Out	Total
Lower Shotover Rd Access	91	258	349
Howards Dr Access	354	333	687
Eastern Access	133	195	328
Total	578	786	1364

Table 5.6 LM Model IP peak post-skim access summary

Access Name	In	Out	Total
Lower Shotover Rd Access	145	152	297
Howards Dr Access	352	364	716
Eastern Access	161	165	326
Total	658	681	1339

Table 5.7 LM Model PM peak post-skim access summary

Access Name	In	Out	Total
Lower Shotover Rd Access	289	136	425
Howards Dr Access	422	397	819
Eastern Access	257	185	442
Total	968	718	1686

6. Impact of mode shift towards public transport

If the pre skim and post skim matrices are compared the reduction of trips by origin and destination area can be calculated. The tables in this section present these vehicle driver trips skimmed from the model. The values represent the number of vehicles removed from the network and not the number of public transport passengers or the number of persons in those vehicles. Additionally, as with previous sections summary tables of the change in flows at the accesses are included.

Table 6.1 Base model AM peak pre-skim/ post-skim comparison

From	To LM	%		To	From LM	%
Basin	-7	-9.0%		Basin	-9	-6.8%
E of Basin	-1	-3.0%		E of Basin	-1	-2.8%
Frk	-11	-12.4%		Frk	-33	-15.2%
LHE	-5	-13.2%		LHE	-3	-11.2%
LMMP	-1	-0.9%		LMMP	-1	-0.9%
SC	-5	-13.2%		SC	-3	-11.0%
SofKwBdg	-3	-6.7%		SofKw Bdg	0	-2.4%
WofBp	-3	-12.1%		WofBp	-48	-36.9%
Total	**-36**	**-8.5%**		**Total**	**-97**	**-15.3%**

Table 6.2 LM model AM peak pre-skim/ post-skim comparison

From	To LM	%		To	From LM	%
Basin	-13	-9.0%		Basin	-16	-6.9%
E of Basin	-2	-3.0%		E of Basin	-2	-3.0%
Frk	-27	-15.4%		Frk	-76	-19.4%
LHE	-9	-14.7%		LHE	-6	-13.8%
LMMP	-1	-0.4%		LMMP	-1	-0.4%
SC	-10	-14.7%		SC	-6	-13.7%
SofKwBdg	-5	-7.4%		SofKw Bdg	-1	-3.7%
WofBp	-8	-15.1%		WofBp	-106	-42.9%
Total	**-75**	**-7.9%**		**Total**	**-214**	**-15.9%**

Table 6.3 Base model PM peak pre-skim/ post-skim comparison

From	To LM	%		To	From LM	%
Basin	-9	-6.4%		Basin	-8	-7.0%
E of Basin	-1	-2.1%		E of Basin	-1	-2.4%
Frk	-40	-17.8%		Frk	-16	-11.3%
LHE	-3	-12.5%		LHE	-5	-11.0%
LMMP	0	-0.6%		LMMP	0	-0.6%
SC	-3	-12.5%		SC	-5	-11.0%
SofKwBdg	-1	-3.6%		SofKwBdg	-1	-2.0%
WofBp	-39	-38.5%		WofBp	-7	-18.1%
Total	**-96**	**-14.5%**		**Total**	**-44**	**-8.0%**

Table 6.4 LM model PM peak pre-skim/ post-skim comparison

From	To LM	%		To	From LM	%
Basin	-18	-6.5%		Basin	-14	-6.9%
E of Basin	-3	-2.2%		E of Basin	-2	-2.2%
Frk	-110	-23.7%		Frk	-35	-12.9%
LHE	-9	-13.8%		LHE	-11	-13.5%
LMMP	-1	-0.1%		LMMP	-1	-0.1%
SC	-7	-13.8%		SC	-10	-13.5%
SofKwBdg	-1	-4.9%		SofKwBdg	-1	-2.2%
WofBp	-89	-45.8%		WofBp	-15	-20.1%
Total	**-238**	**-14.3%**		**Total**	**-89**	**-6.9%**

Table 6.5 LM Model AM peak pre-skim access summary

Access Name	In	Out	Total
Lower Shotover Rd Access	-11	-101	-112
Howards Dr Access	-55	-70	-125
Eastern Access	-11	-33	-44
Total	-77	-204	-281

Table 6.6 LM Model IP peak pre-skim access summary

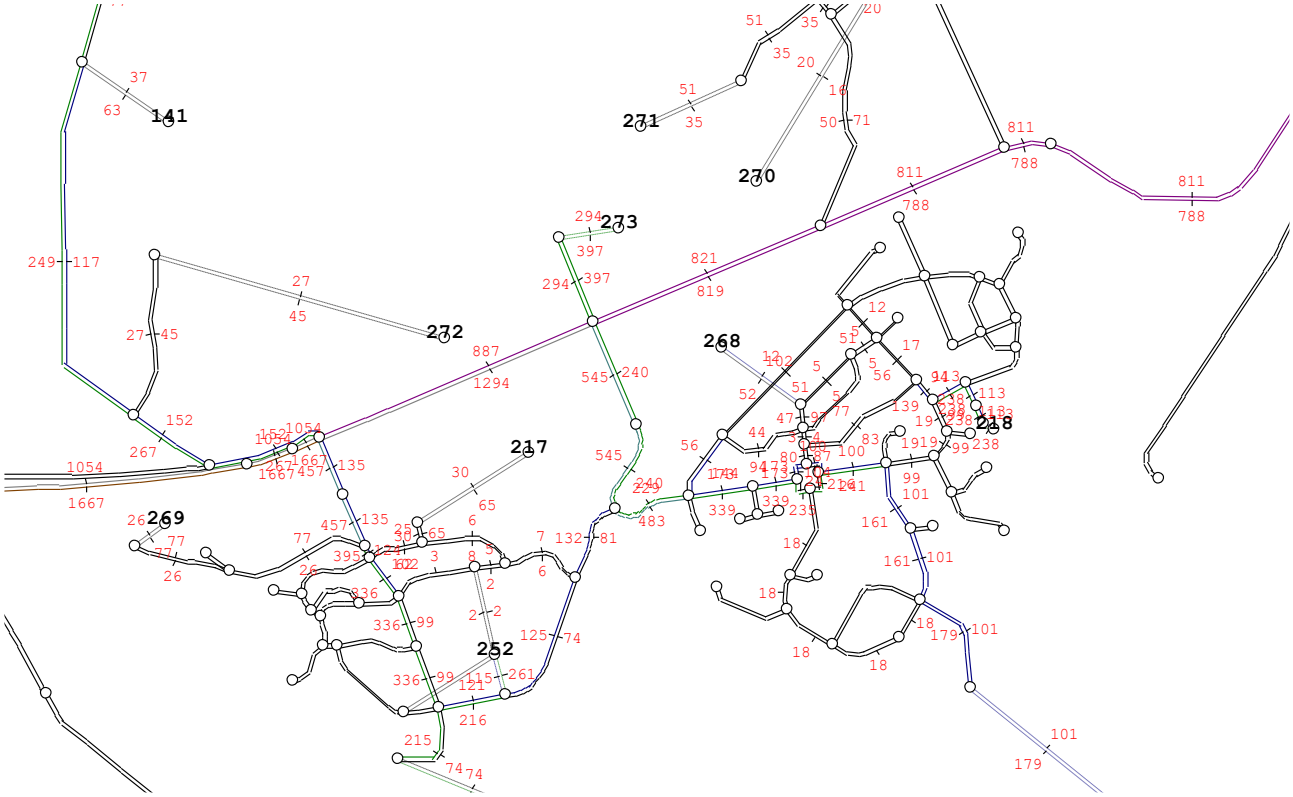
Access Name	In	Out	Total
Lower Shotover Rd Access	-22	-8	-30
Howards Dr Access	-47	-38	-85
Eastern Access	-9	-8	-17
Total	-78	-54	-132

Table 6.7 LM Model PM peak pre-skim access summary

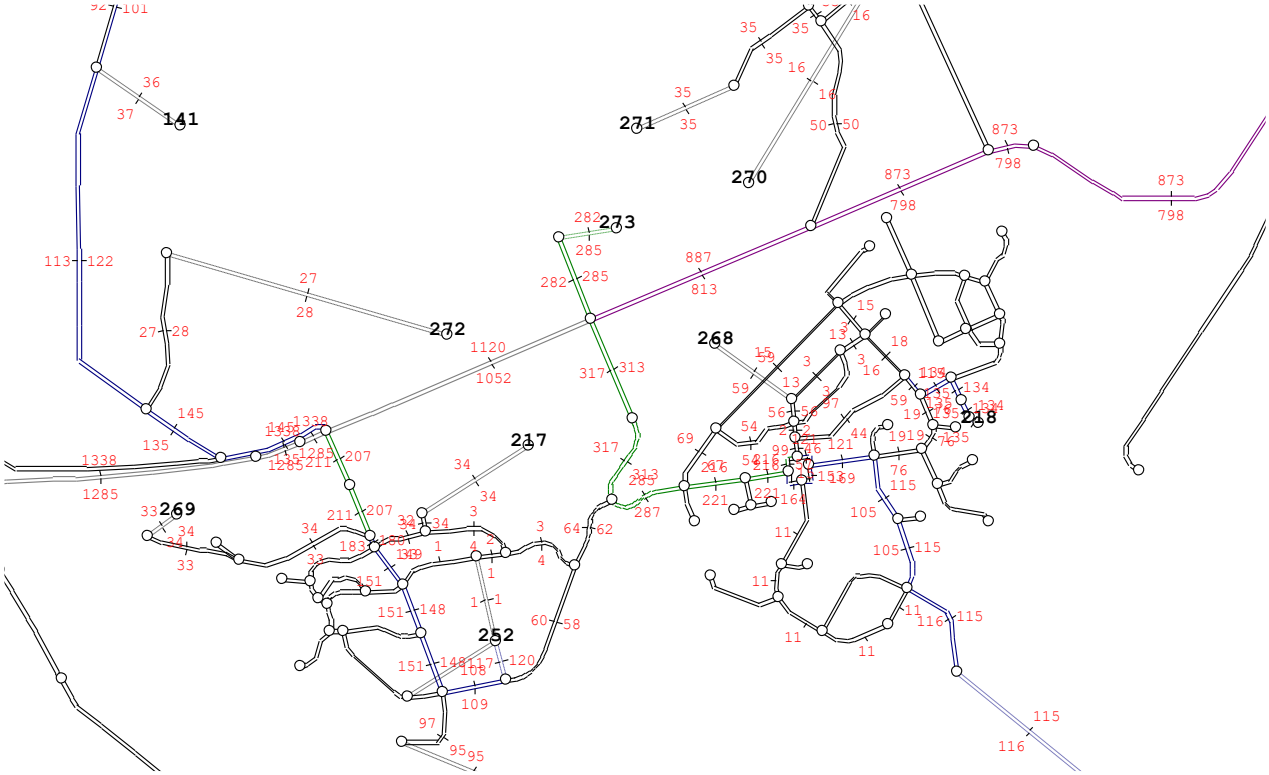
Access Name	In	Out	Total
Lower Shotover Rd Access	-113	-18	-131
Howards Dr Access	-86	-54	-140
Eastern Access	-38	-14	-52
Total	-237	-86	-323

Appendix A.
Collated Tracks Outputs

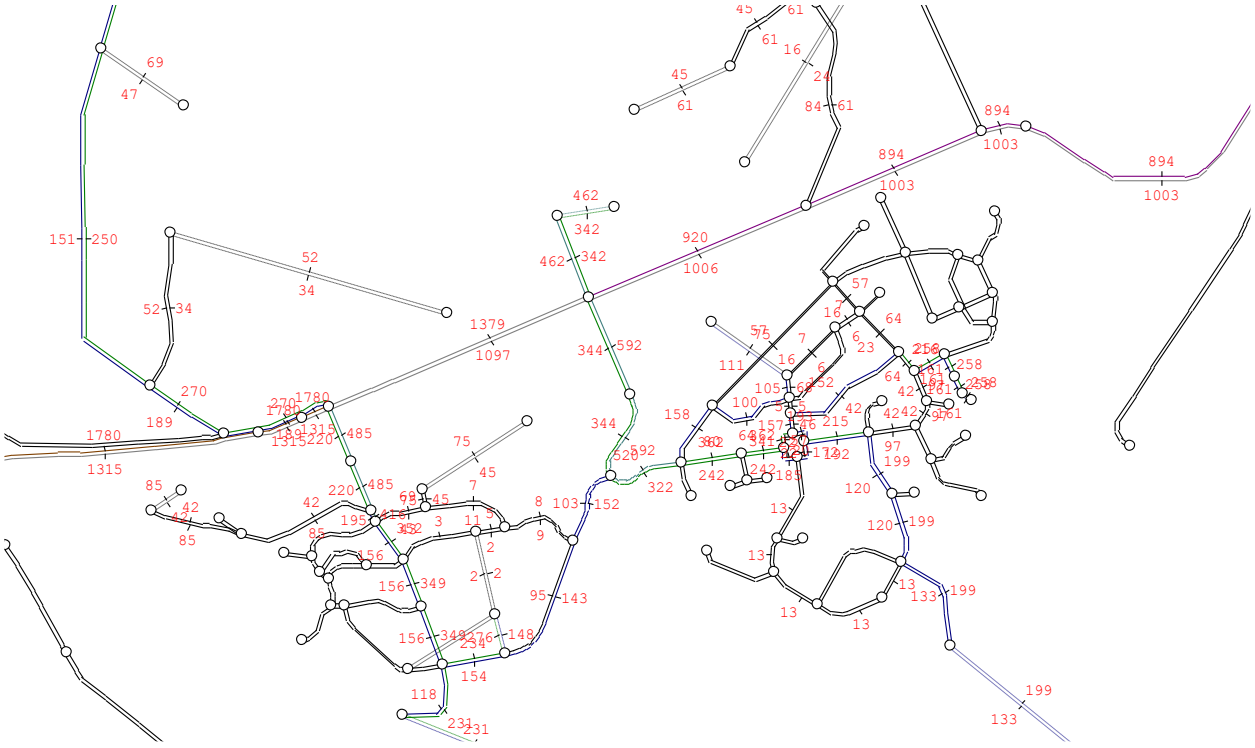
A1. AM Base Pre-skim



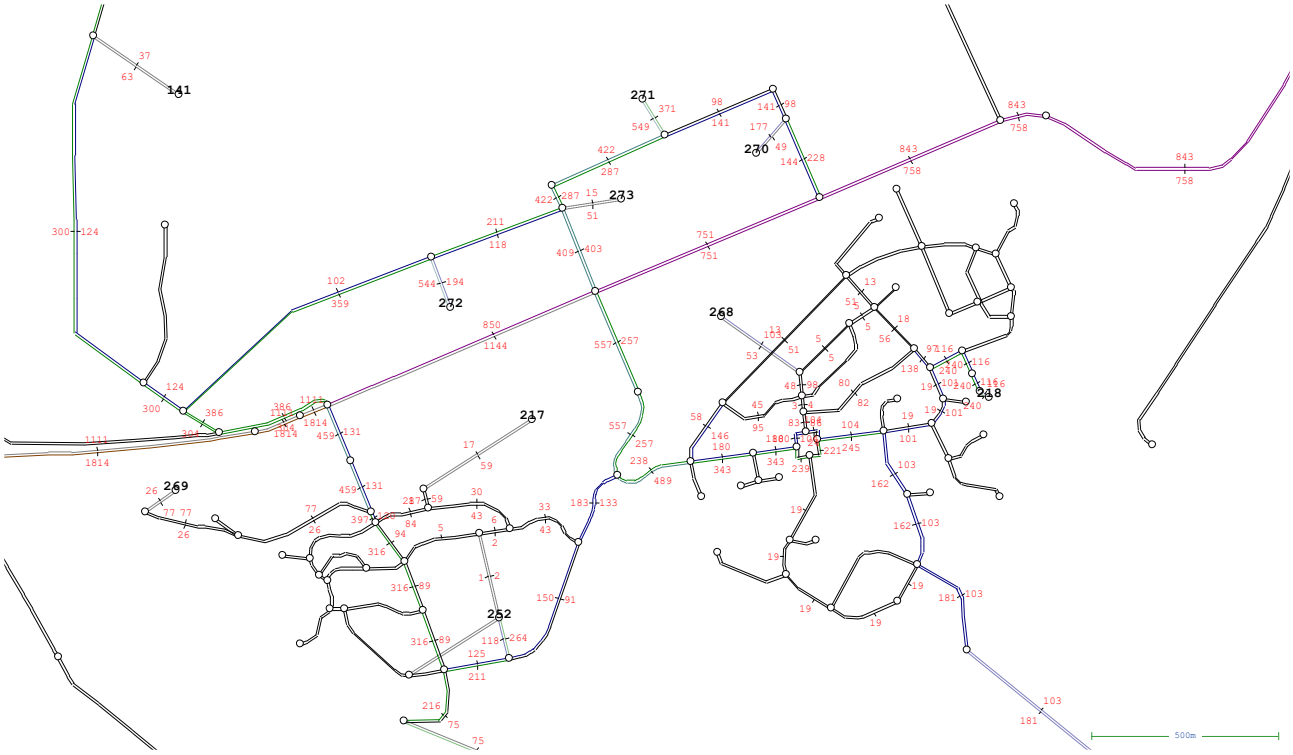
A2. IP Base Pre-skim



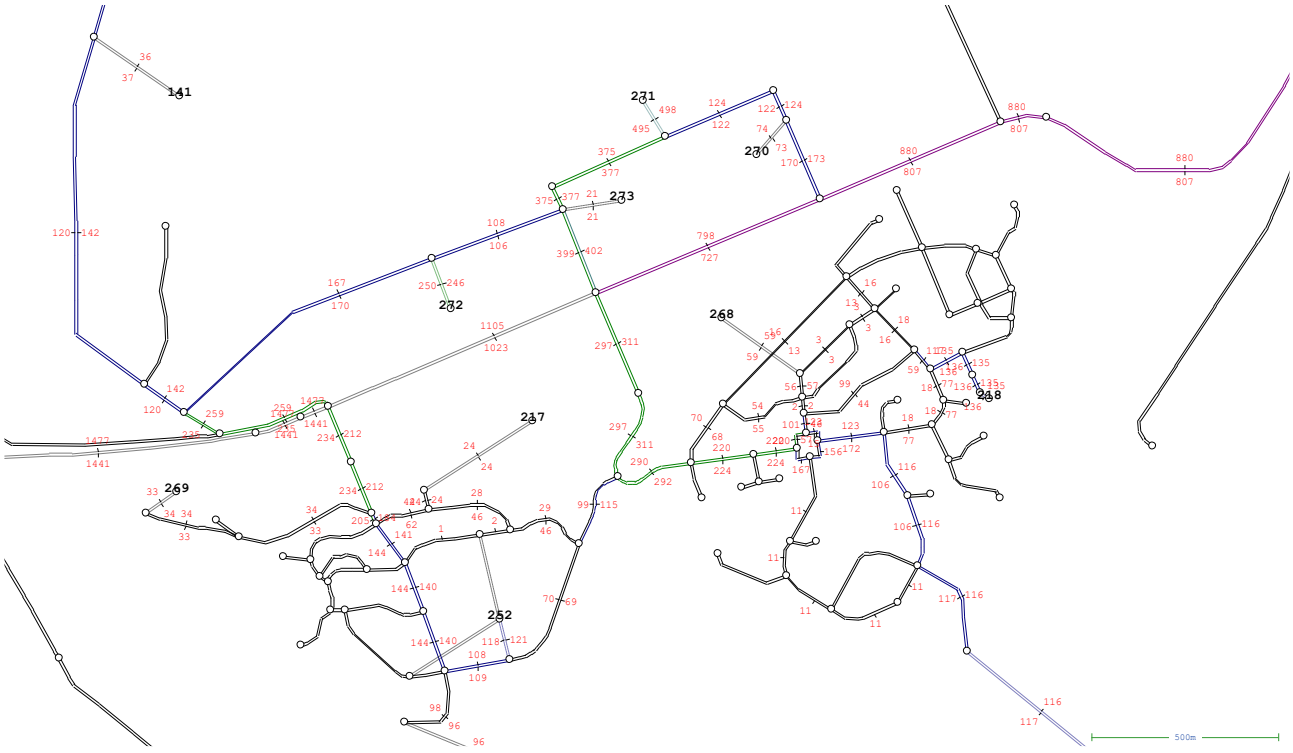
A3. PM Base Pre-skim



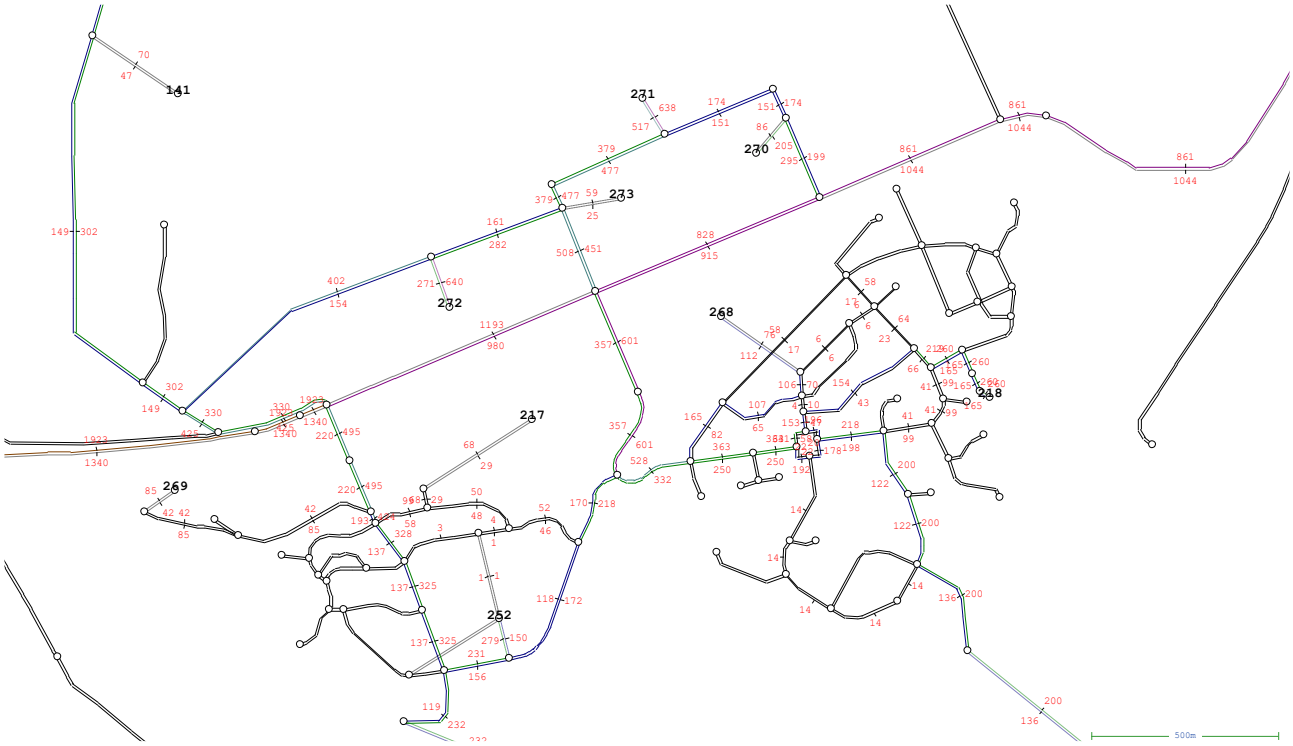
A4. AM w/ Dev Pre-skim



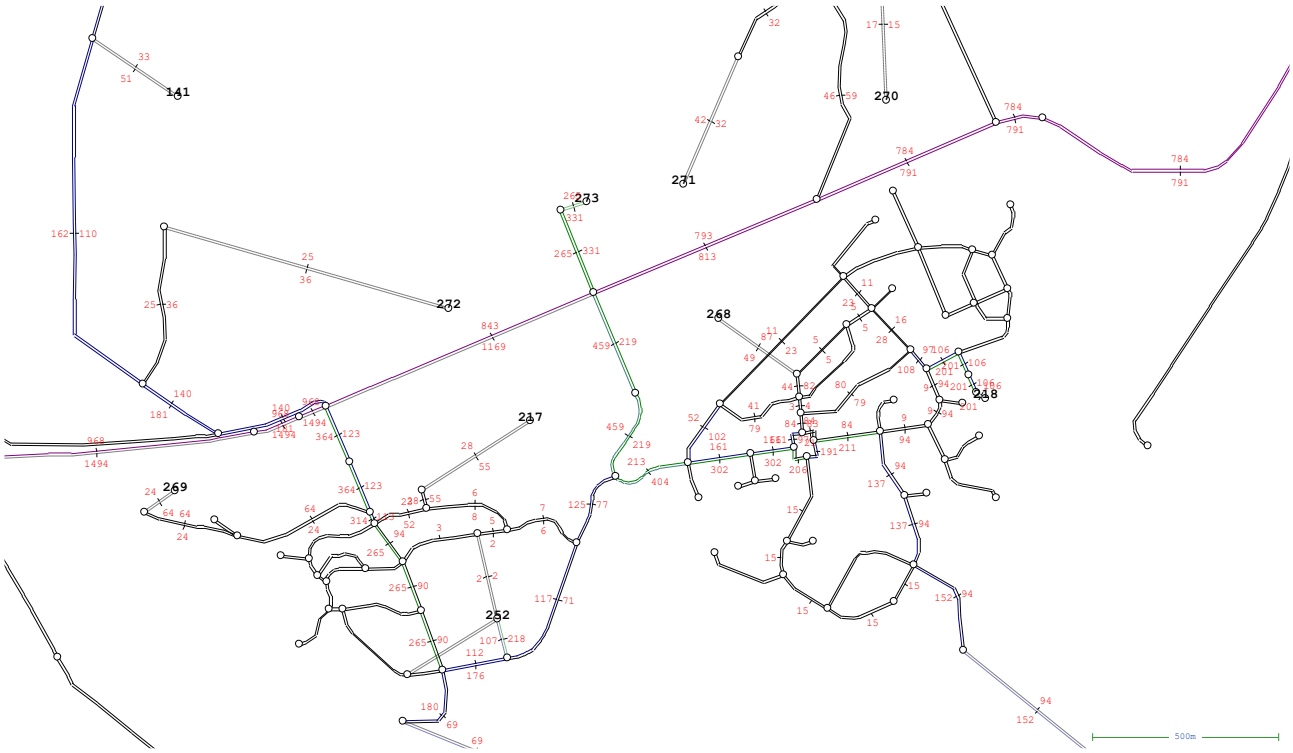
A5. IP w/ Dev Pre-skim



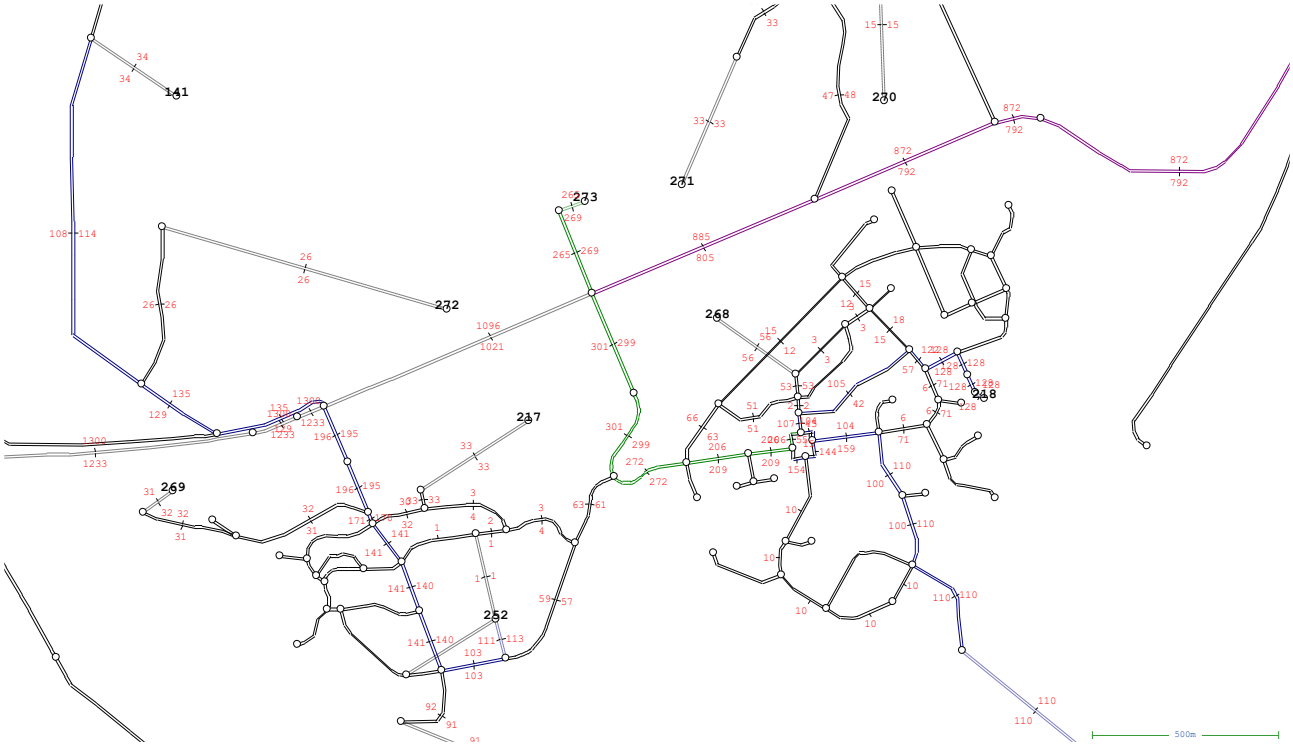
A6. PM w/ Dev Pre-skim



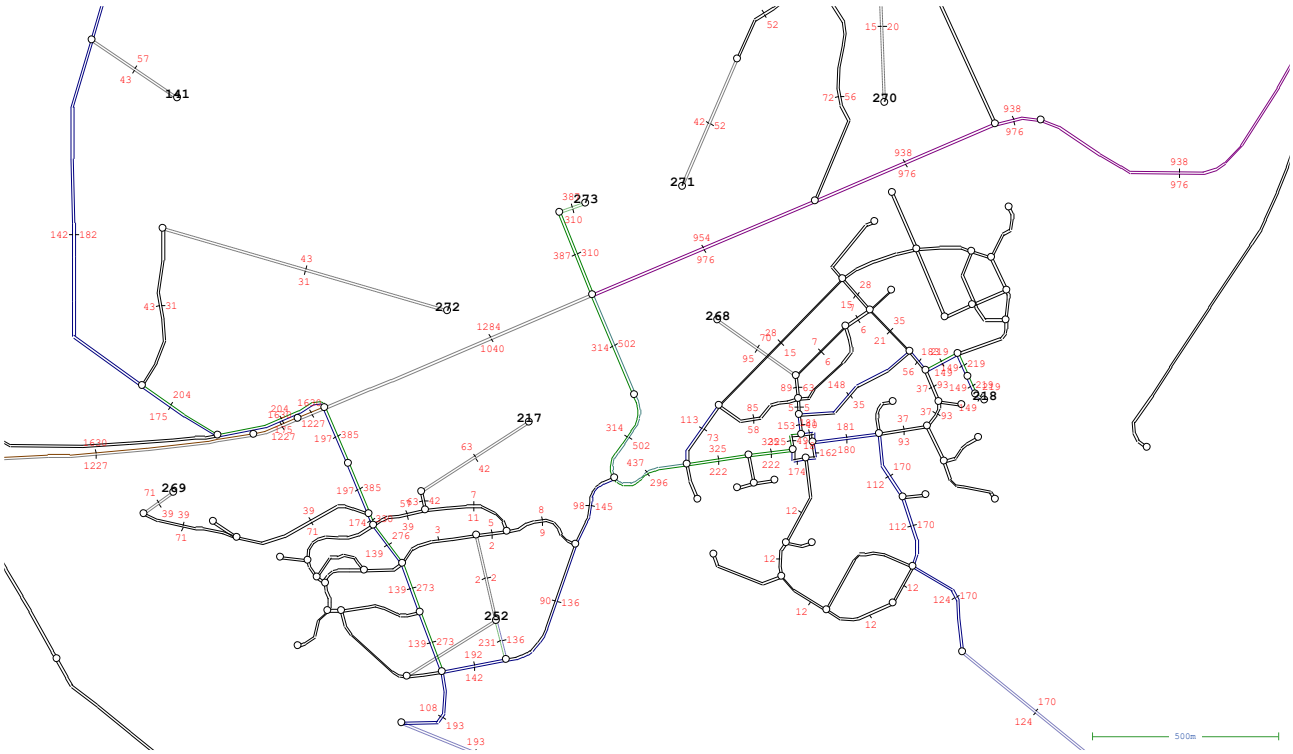
A7. AM Base Post-skim



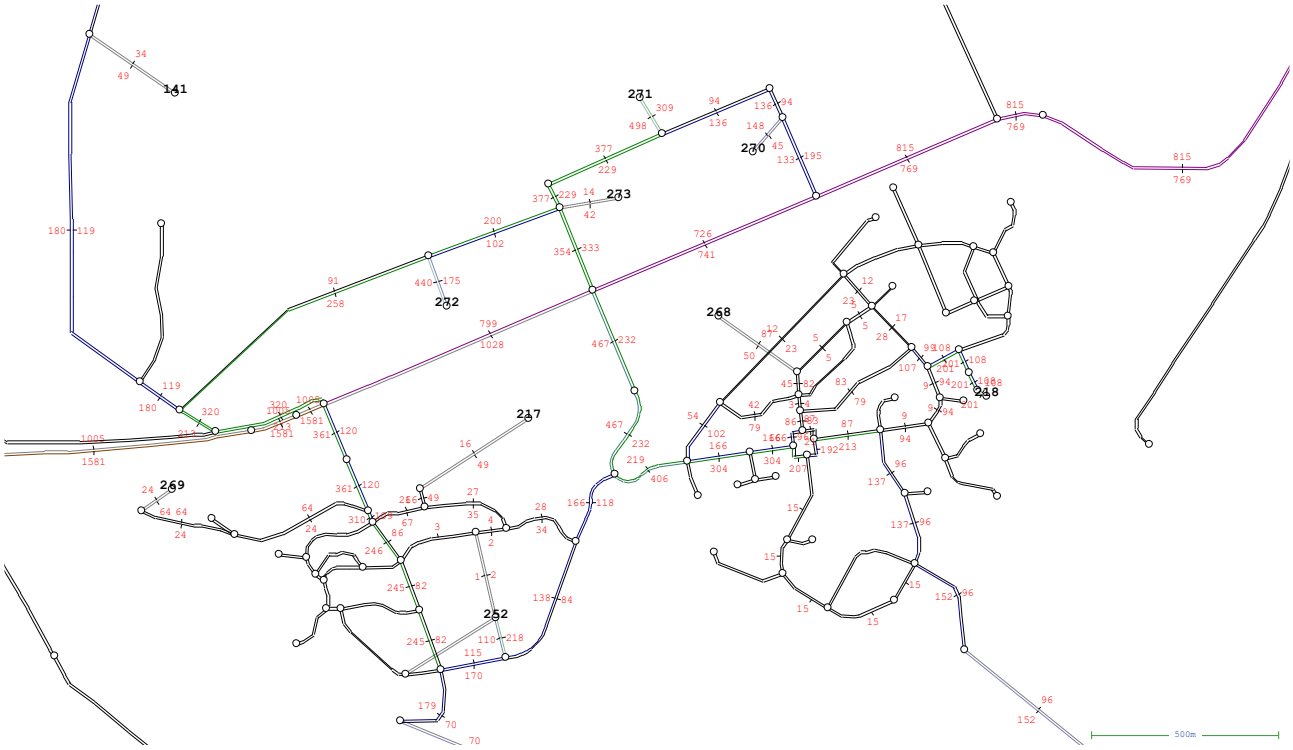
A8. IP Base Post-skim



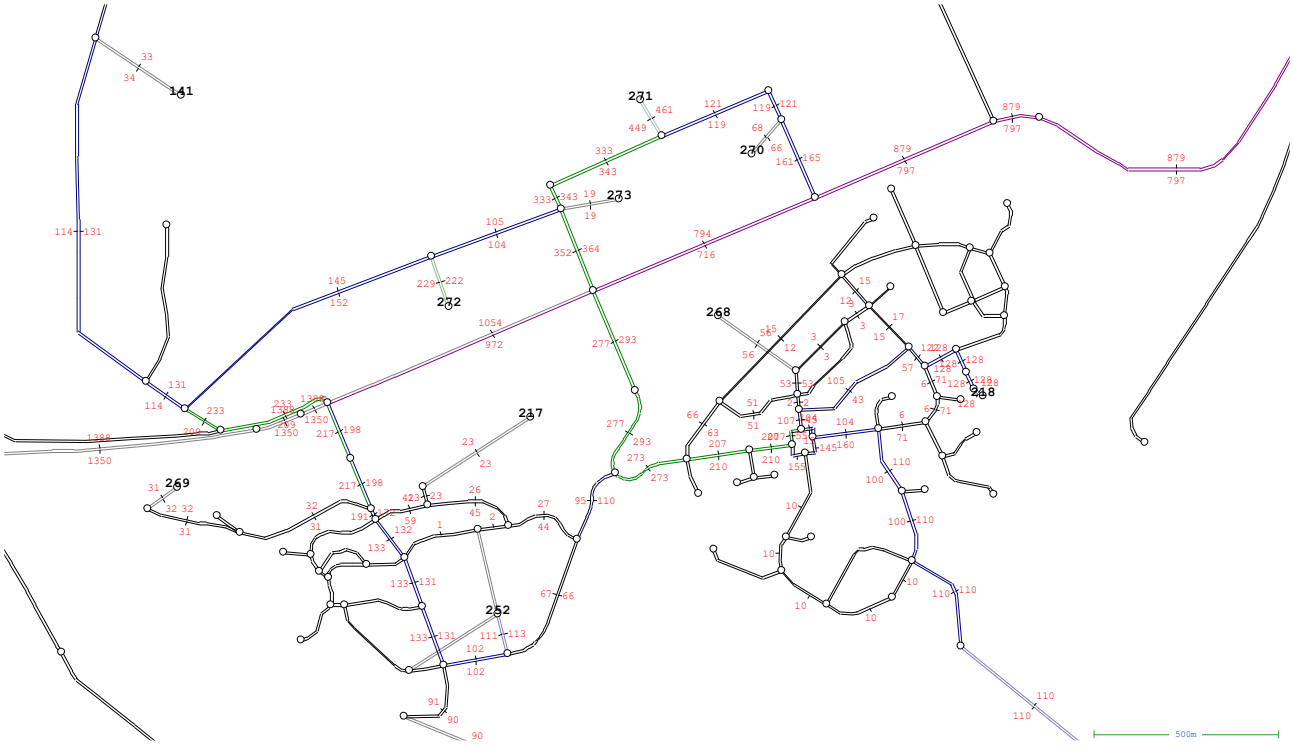
A9. PM Base Post-skim



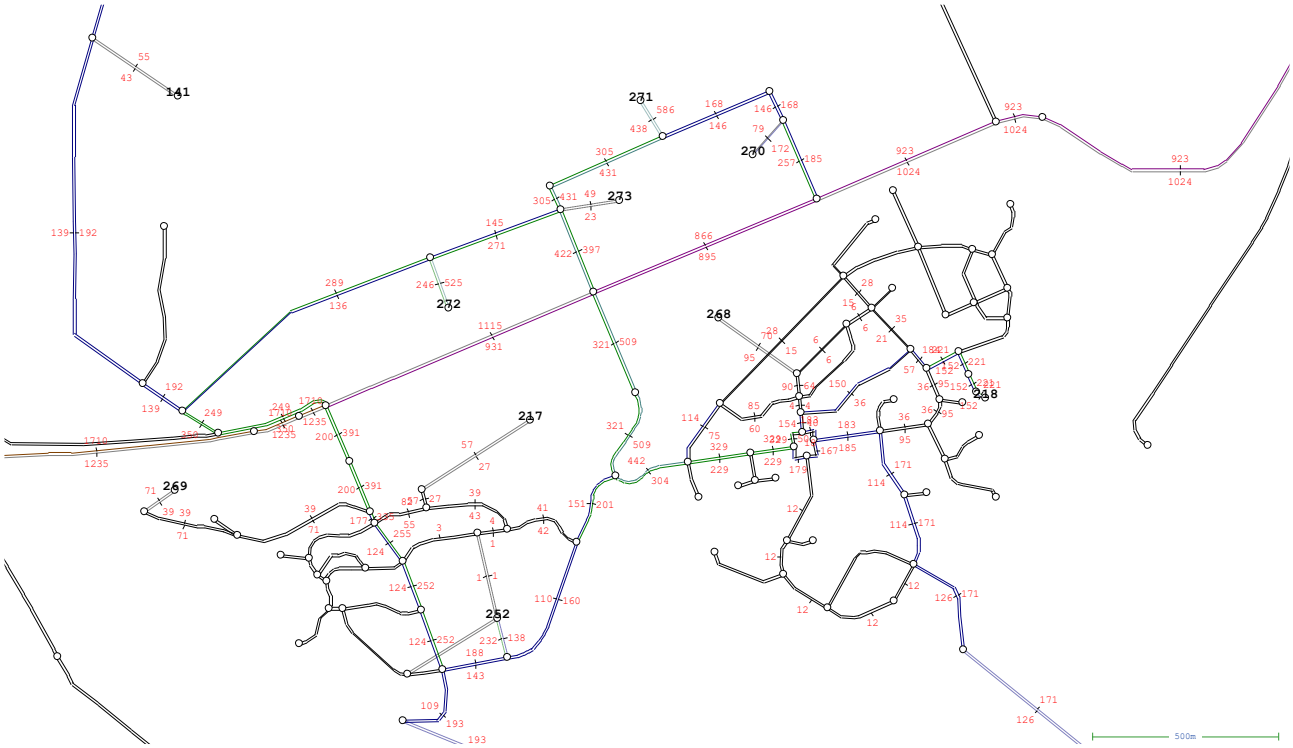
A10. AM w/ Dev Post-skim



A11. IP w/ Dev Post-skim



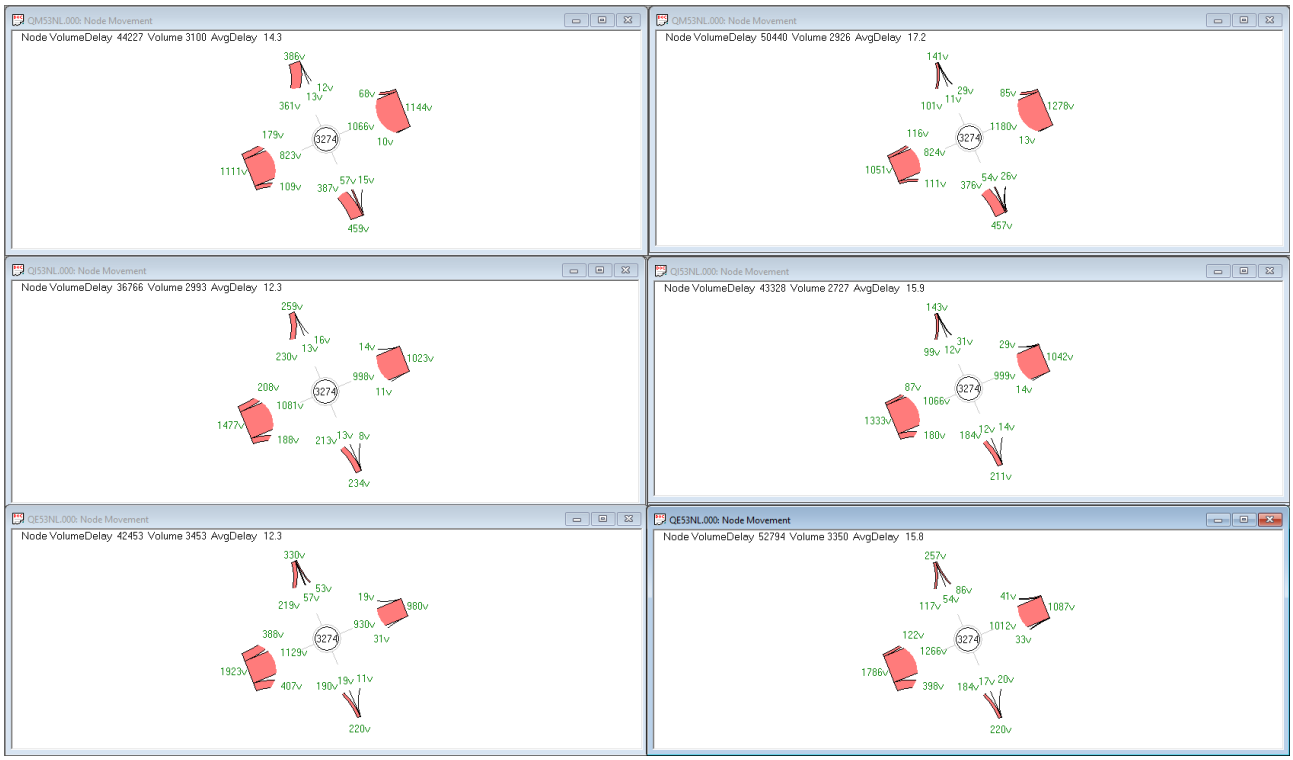
A12. PM w/ Dev Post-skim



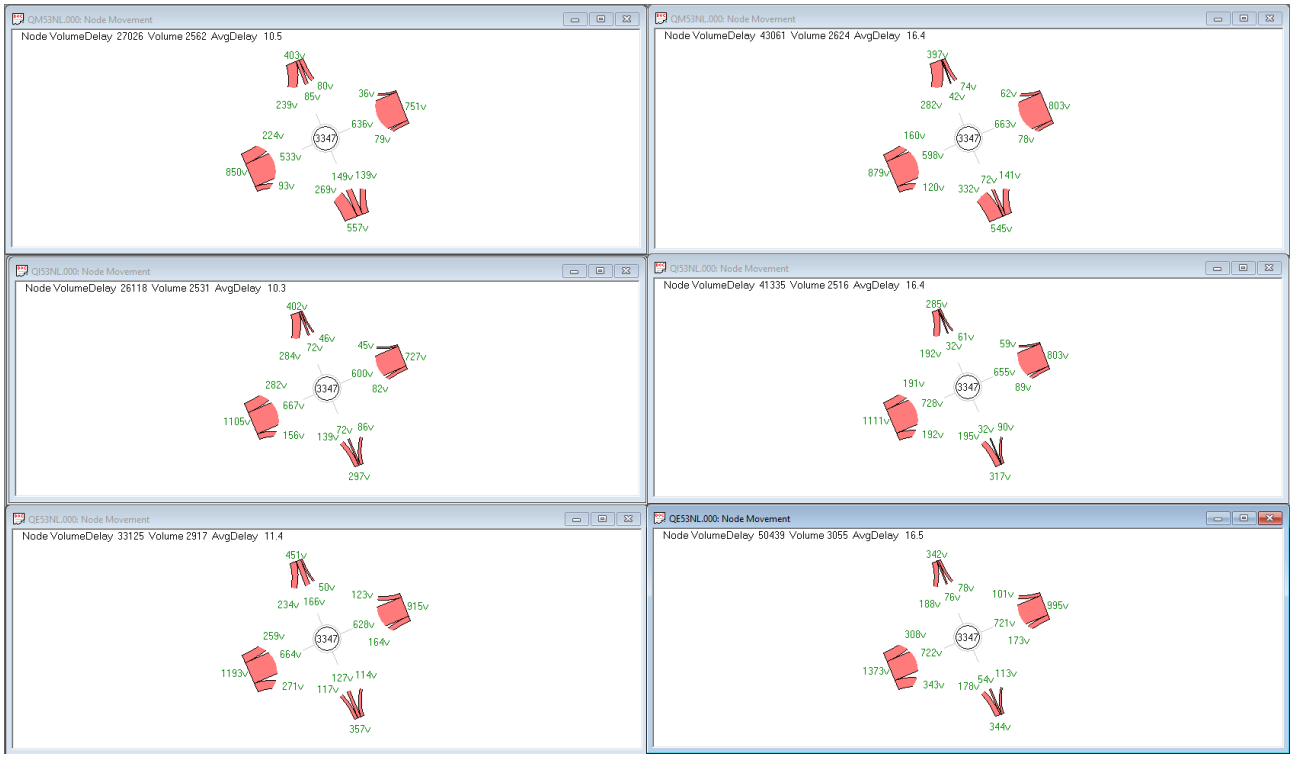
A13. Lower Shotover/Stalker Rd Roundabout Pre-skim

Left hand side is WITH LM development, right hand side is base. Top is AM, middle is IP, bottom is PM. This applies to A13-A18

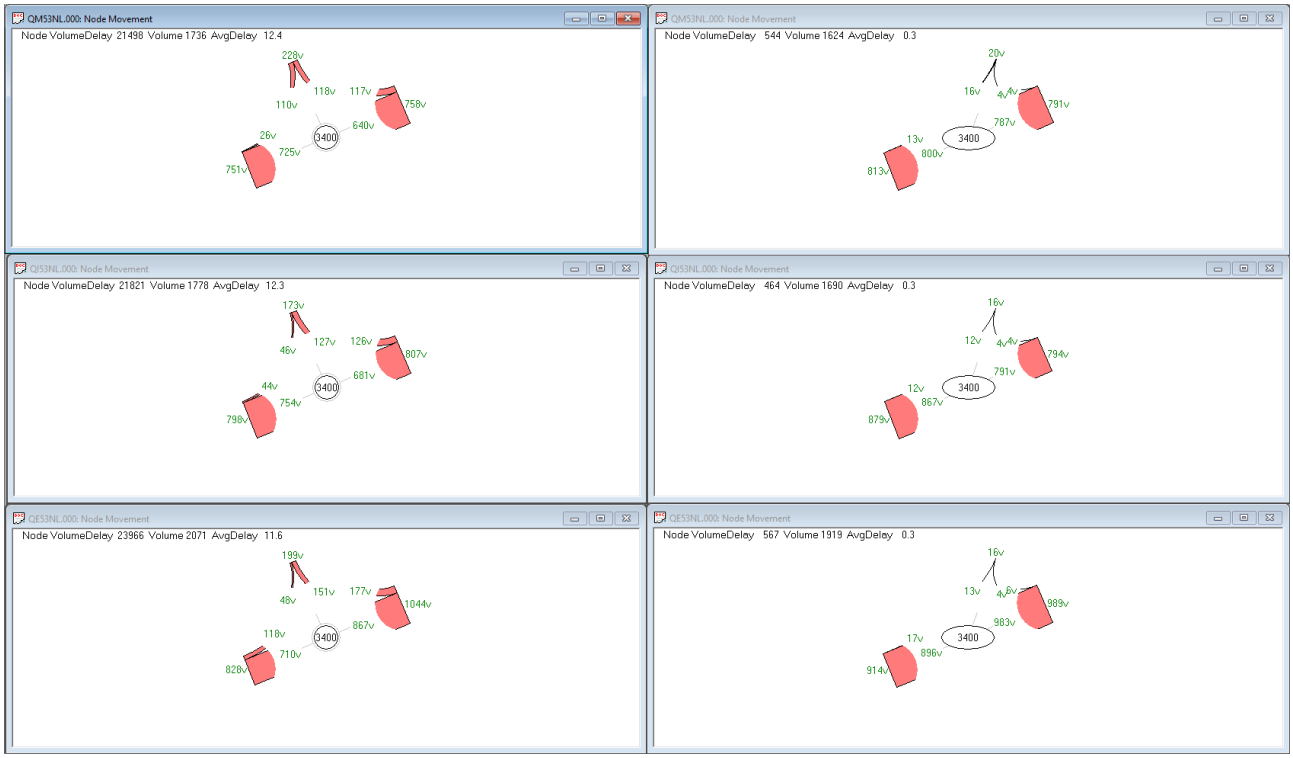
Please note the intersection average delay are from a strategic model and are therefore based on a limited number of design inputs and will substanitally under-represent actual delays. The roundabout performance should be assessed using Sidra Intersection software or another more detailed evaluation package. This applies to all of the remaining outputs in Appendix A.



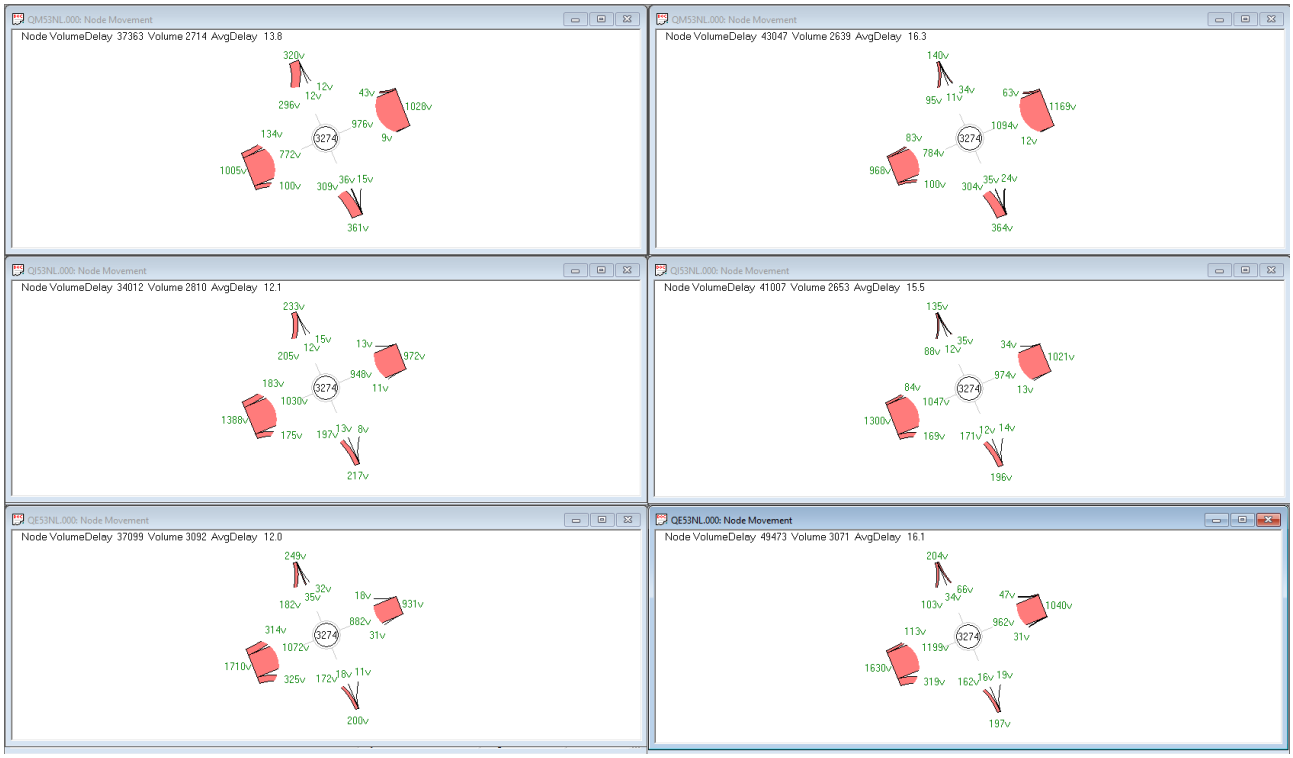
A14. Howards Drive Roundabout Pre-skim



A15. Eastern Access Roundabout Pre-skim

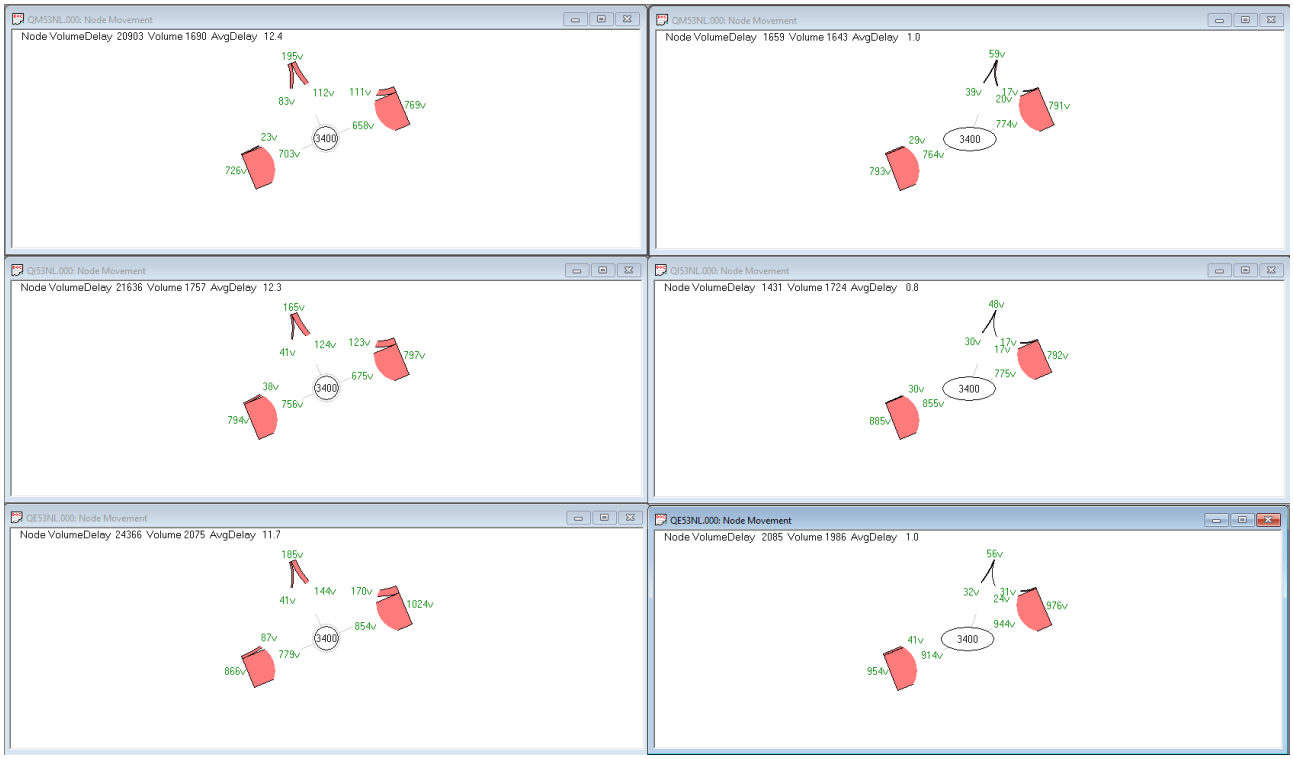


A16. Lower Shotover/Stalker Road Roundabout Post-skim



A17. Howards Drive Roundabout Post-skim

A18. Eastern Access Roundabout Post-skim



Appendix B.

Public Transport Model Outputs

B1. Bus percentage mode share by sector AM

Bus Mode Share	Town Centre	Fernhill	Cromwell	Frankton Rd	Frankton	Remarkables	Kelvin Heigh	Arrowtown	Ladies Mile	Lake Hayes/	Skippers	Glenorchy	Arthurs Point	Kingston	Jacks Point	Frankton So	Five Mile	Airport	Frankton No	Speargrass	Wanaka
Town Centre	0%	15%	0%	16%	22%	17%	7%	9%	17%	15%	0%	0%	13%	0%	5%	10%	18%	22%	18%	0%	0%
Fernhill	40%	0%	0%	8%	12%	8%	3%	4%	8%	9%	0%	0%	7%	0%	2%	5%	10%	10%	10%	0%	0%
Cromwell	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton Rd	39%	8%	0%	0%	13%	10%	5%	8%	12%	9%	0%	0%	7%	0%	3%	6%	10%	14%	11%	0%	0%
Frankton	50%	12%	0%	14%	0%	16%	8%	15%	19%	14%	0%	0%	11%	0%	5%	8%	18%	22%	17%	0%	0%
Remarkables Park	47%	16%	0%	12%	20%	0%	15%	10%	7%	6%	0%	0%	14%	0%	8%	11%	11%	21%	11%	0%	0%
Kelvin Heights	25%	9%	0%	13%	33%	23%	0%	10%	15%	17%	0%	0%	8%	0%	5%	13%	22%	11%	22%	0%	0%
Arrowtown	18%	3%	0%	13%	22%	8%	6%	0%	17%	13%	0%	0%	2%	0%	3%	11%	21%	19%	21%	0%	0%
Ladies Mile	49%	11%	0%	17%	24%	10%	8%	16%	0%	15%	0%	0%	3%	0%	4%	13%	23%	22%	23%	0%	0%
Lake Hayes/Shotover Countr	52%	12%	0%	14%	20%	8%	10%	12%	15%	0%	0%	0%	2%	0%	3%	10%	18%	18%	18%	0%	0%
Skippers	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Glenorchy	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Arthurs Point	37%	6%	0%	7%	10%	6%	3%	3%	3%	2%	0%	0%	0%	0%	1%	4%	9%	9%	9%	0%	0%
Kingston	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Jacks Point	28%	4%	0%	9%	15%	17%	8%	5%	7%	7%	0%	0%	3%	0%	0%	9%	11%	16%	11%	0%	0%
Frankton South East	41%	11%	0%	10%	16%	10%	7%	23%	8%	7%	0%	0%	7%	0%	5%	0%	9%	11%	9%	0%	0%
Five Mile	46%	10%	0%	11%	17%	7%	7%	14%	17%	12%	0%	0%	9%	0%	4%	6%	0%	12%	0%	0%	0%
Airport	72%	25%	0%	29%	39%	22%	8%	28%	33%	28%	0%	0%	23%	0%	7%	12%	25%	0%	25%	0%	0%
Frankton North	46%	10%	0%	11%	17%	7%	7%	14%	17%	12%	0%	0%	9%	0%	4%	6%	0%	12%	0%	0%	0%
Speargrass	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Wanaka	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

B2. Ferry percentage mode share by sector AM

Ferry Mode Share	Town Centre	Fernhill	Cromwell	Frankton Rd	Frankton	Remarkables	Kelvin Heigh	Arrowtown	Ladies Mile	Lake Hayes/	Skippers	Glenorchy	Arthurs Point	Kingston	Jacks Point	Frankton So	Five Mile	Airport	Frankton No	Speargrass	Wanaka
Town Centre	0%	0%	0%	2%	2%	1%	6%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%
Fernhill	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Cromwell	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton Rd	6%	0%	0%	0%	3%	1%	4%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%
Frankton	8%	0%	0%	3%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Remarkables Park	4%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Kelvin Heights	50%	3%	0%	21%	8%	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	2%	2%	2%	1%	0%	0%
Arrowtown	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Ladies Mile	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lake Hayes/Shotover Countr	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Skippers	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Glenorchy	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Arthurs Point	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Kingston	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Jacks Point	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton South East	3%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Five Mile	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Airport	3%	0%	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton North	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Speargrass	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Wanaka	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

B3. Car percentage mode share by sector AM

Car Mode Share	Town Centre	Fernhill	Cromwell	Frankton Rd	Frankton	Remarkables	Kelvin Heigh	Arrowtown	Ladies Mile	Lake Hayes/	Skippers	Glenorchy	Arthurs Point	Kingston	Jacks Point	Frankton So	Five Mile	Airport	Frankton No	Speargrass	Wanaka
Town Centre	100%	85%	100%	82%	76%	82%	87%	91%	83%	85%	100%	100%	87%	100%	95%	90%	82%	77%	82%	100%	100%
Fernhill	60%	100%	100%	91%	88%	92%	96%	96%	92%	91%	100%	100%	93%	100%	98%	95%	90%	90%	90%	100%	100%
Cromwell	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Frankton Rd	55%	92%	100%	100%	84%	89%	91%	92%	88%	91%	100%	100%	93%	100%	97%	93%	89%	85%	89%	100%	100%
Frankton	42%	87%	100%	82%	100%	84%	90%	85%	81%	86%	100%	100%	89%	100%	95%	92%	82%	78%	83%	100%	100%
Remarkables Park	49%	84%	100%	86%	80%	100%	84%	90%	93%	94%	100%	100%	86%	100%	92%	89%	89%	79%	89%	100%	100%
Kelvin Heights	24%	87%	100%	67%	58%	75%	100%	90%	84%	83%	100%	100%	92%	100%	95%	86%	76%	87%	76%	100%	100%
Arrowtown	82%	97%	100%	87%	78%	92%	94%	100%	83%	87%	100%	100%	98%	100%	97%	89%	79%	81%	79%	100%	100%
Ladies Mile	51%	89%	100%	83%	76%	90%	92%	84%	100%	85%	100%	100%	97%	100%	96%	87%	77%	78%	77%	100%	100%
Lake Hayes/Shotover Countr	48%	88%	100%	86%	80%	92%	90%	88%	85%	100%	100%	100%	98%	100%	97%	90%	82%	82%	82%	100%	100%
Skippers	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Glenorchy	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Arthurs Point	63%	94%	100%	93%	90%	94%	97%	97%	97%	98%	100%	100%	100%	100%	99%	96%	91%	91%	91%	100%	100%
Kingston	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Jacks Point	72%	96%	100%	91%	85%	83%	92%	95%	93%	93%	100%	100%	97%	100%	100%	91%	89%	84%	89%	100%	100%
Frankton South East	56%	89%	100%	89%	84%	90%	93%	77%	92%	93%	100%	100%	93%	100%	95%	100%	91%	89%	91%	100%	100%
Five Mile	54%	90%	100%	88%	83%	93%	93%	86%	83%	88%	100%	100%	91%	100%	96%	94%	100%	88%	100%	100%	100%
Airport	26%	74%	100%	69%	61%	78%	91%	72%	67%	72%	100%	100%	77%	100%	93%	88%	75%	100%	75%	100%	100%
Frankton North	54%	90%	100%	88%	83%	93%	93%	86%	83%	88%	100%	100%	91%	100%	96%	94%	100%	88%	100%	100%	100%
Speargrass	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Wanaka	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

B4. Bus percentage mode share by sector IP

Bus Mode Share	Town Centre	Fernhill	Cromwell	Frankton Rd	Frankton	Remarkables	Kelvin Heigh	Arrowtown	Ladies Mile	Lake Hayes/	Skippers	Glenorchy	Arthurs Point	Kingston	Jacks Point	Frankton Sou	Five Mile	Airport	Frankton Nor	Speargrass	Wanaka
Town Centre	0%	19%	0%	23%	31%	19%	8%	8%	28%	20%	0%	0%	17%	0%	5%	10%	26%	27%	26%	0%	0%
Fernhill	18%	0%	0%	4%	7%	4%	2%	1%	5%	5%	0%	0%	3%	0%	1%	2%	6%	4%	6%	0%	0%
Cromwell	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton Rd	21%	4%	0%	0%	9%	5%	3%	5%	10%	5%	0%	0%	4%	0%	1%	3%	7%	7%	7%	0%	0%
Frankton	31%	7%	0%	10%	0%	9%	6%	10%	18%	9%	0%	0%	6%	0%	3%	6%	14%	16%	12%	0%	0%
Remarkables Park	22%	6%	0%	7%	12%	0%	9%	5%	6%	4%	0%	0%	5%	0%	5%	8%	8%	13%	9%	0%	0%
Kelvin Heights	13%	3%	0%	5%	13%	10%	0%	4%	7%	6%	0%	0%	2%	0%	3%	4%	9%	5%	9%	0%	0%
Arrowtown	7%	1%	0%	5%	10%	4%	2%	0%	11%	7%	0%	0%	1%	0%	1%	5%	10%	8%	10%	0%	0%
Ladies Mile	21%	4%	0%	8%	13%	5%	4%	10%	0%	9%	0%	0%	1%	0%	2%	6%	12%	11%	12%	0%	0%
Lake Hayes/Shotover Countr	19%	5%	0%	5%	9%	3%	3%	6%	9%	0%	0%	0%	1%	0%	1%	4%	8%	7%	8%	0%	0%
Skippers	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Glenorchy	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Arthurs Point	15%	3%	0%	4%	6%	3%	1%	1%	1%	1%	0%	0%	0%	0%	0%	2%	5%	4%	5%	0%	0%
Kingston	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Jacks Point	7%	1%	0%	3%	5%	6%	3%	2%	3%	2%	0%	0%	1%	0%	0%	2%	3%	5%	3%	0%	0%
Frankton South East	16%	5%	0%	5%	9%	7%	4%	10%	5%	4%	0%	0%	3%	0%	2%	0%	6%	8%	6%	0%	0%
Five Mile	24%	6%	0%	7%	13%	5%	5%	9%	15%	8%	0%	0%	5%	0%	2%	4%	0%	9%	0%	0%	0%
Airport	42%	12%	0%	15%	26%	16%	5%	16%	22%	16%	0%	0%	11%	0%	5%	9%	16%	0%	16%	0%	0%
Frankton North	24%	6%	0%	7%	13%	5%	5%	9%	15%	8%	0%	0%	5%	0%	2%	4%	0%	9%	0%	0%	0%
Speargrass	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Wanaka	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

B5. Ferry percentage mode share by sector IP

Ferry Mode Share	Town Centre	Fernhill	Cromwell	Frankton Rd	Frankton	Remarkables	Kelvin Heigh	Arrowtown	Ladies Mile	Lake Hayes/	Skippers	Glenorchy	Arthurs Point	Kingston	Jacks Point	Frankton Sou	Five Mile	Airport	Frankton Nor	Speargrass	Wanaka
Town Centre	0%	0%	0%	3%	3%	2%	13%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%
Fernhill	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Cromwell	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton Rd	3%	0%	0%	0%	2%	1%	4%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%
Frankton	4%	0%	0%	2%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Remarkables Park	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Kelvin Heights	17%	1%	0%	5%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Arrowtown	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Ladies Mile	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lake Hayes/Shotover Countr	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Skippers	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Glenorchy	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Arthurs Point	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Kingston	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Jacks Point	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton South East	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Five Mile	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Airport	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton North	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Speargrass	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Wanaka	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

B6. Car percentage mode share by sector IP

Car Mode Share	Town Centre	Fernhill	Cromwell	Frankton Rd	Frankton	Remarkables	Kelvin Heigh	Arrowtown	Ladies Mile	Lake Hayes/	Skippers	Glenorchy	Arthurs Point	Kingston	Jacks Point	Frankton Sou	Five Mile	Airport	Frankton Nor	Speargrass	Wanaka
Town Centre	100%	81%	100%	75%	66%	79%	79%	92%	72%	80%	100%	100%	83%	100%	95%	89%	74%	71%	74%	100%	100%
Fernhill	82%	100%	100%	95%	93%	96%	98%	99%	95%	95%	100%	100%	97%	100%	99%	98%	94%	96%	94%	100%	100%
Cromwell	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Frankton Rd	77%	96%	100%	100%	89%	94%	93%	95%	90%	95%	100%	100%	96%	100%	99%	96%	93%	92%	93%	100%	100%
Frankton	65%	93%	100%	88%	100%	91%	93%	90%	82%	91%	100%	100%	94%	100%	97%	94%	86%	84%	88%	100%	100%
Remarkables Park	77%	94%	100%	93%	88%	100%	90%	95%	94%	96%	100%	100%	95%	100%	95%	92%	92%	87%	91%	100%	100%
Kelvin Heights	70%	96%	100%	90%	85%	90%	100%	96%	93%	94%	100%	100%	97%	100%	97%	95%	91%	95%	91%	100%	100%
Arrowtown	93%	99%	100%	95%	90%	96%	98%	100%	89%	93%	100%	100%	99%	100%	99%	95%	90%	92%	90%	100%	100%
Ladies Mile	79%	96%	100%	92%	87%	95%	96%	90%	100%	91%	100%	100%	99%	100%	98%	94%	88%	89%	88%	100%	100%
Lake Hayes/Shotover Countr	81%	95%	100%	94%	91%	97%	97%	94%	91%	100%	100%	100%	99%	100%	99%	96%	92%	93%	92%	100%	100%
Skippers	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Glenorchy	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Arthurs Point	85%	97%	100%	96%	94%	97%	99%	99%	99%	99%	100%	100%	100%	100%	100%	98%	95%	96%	95%	100%	100%
Kingston	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Jacks Point	93%	99%	100%	97%	95%	94%	97%	98%	97%	98%	100%	100%	99%	100%	100%	98%	97%	95%	97%	100%	100%
Frankton South East	83%	95%	100%	95%	91%	93%	96%	90%	95%	96%	100%	100%	97%	100%	98%	100%	94%	92%	94%	100%	100%
Five Mile	75%	94%	100%	93%	87%	95%	95%	91%	85%	92%	100%	100%	95%	100%	98%	96%	100%	91%	100%	100%	100%
Airport	57%	87%	100%	84%	74%	84%	95%	84%	78%	84%	100%	100%	89%	100%	95%	91%	84%	100%	84%	100%	100%
Frankton North	75%	94%	100%	93%	87%	95%	95%	91%	85%	92%	100%	100%	95%	100%	98%	96%	100%	91%	100%	100%	100%
Speargrass	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Wanaka	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

B7. Bus percentage mode share by sector PM

Bus Mode Share	Town Centre	Fernhill	Cromwell	Frankton Rd	Frankton	Remarkables	Kelvin Height	Arrowtown	Ladies Mile	Lake Hayes/S	Skippers	Glenorchy	Arthurs Point	Kingston	Jacks Point	Frankton Sou	Five Mile	Airport	Frankton Nor	Speargrass	Wanaka
Town Centre	0%	41%	0%	42%	49%	42%	10%	15%	54%	56%	0%	0%	39%	0%	10%	29%	46%	51%	46%	0%	0%
Fernhill	26%	0%	0%	8%	11%	7%	2%	2%	11%	13%	0%	0%	6%	0%	1%	4%	10%	6%	10%	0%	0%
Cromwell	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton Rd	26%	7%	0%	0%	12%	9%	4%	12%	19%	15%	0%	0%	7%	0%	2%	5%	10%	13%	10%	0%	0%
Frankton	36%	11%	0%	14%	0%	15%	7%	24%	30%	23%	0%	0%	11%	0%	5%	8%	17%	20%	16%	0%	0%
Remarkables Park	17%	7%	0%	5%	12%	0%	14%	13%	10%	9%	0%	0%	6%	0%	7%	10%	11%	19%	11%	0%	0%
Kelvin Heights	14%	4%	0%	6%	12%	15%	0%	8%	11%	11%	0%	0%	3%	0%	6%	8%	9%	7%	9%	0%	0%
Arrowtown	14%	4%	0%	9%	15%	5%	3%	0%	16%	12%	0%	0%	2%	0%	1%	8%	14%	12%	14%	0%	0%
Ladies Mile	26%	8%	0%	11%	16%	6%	5%	15%	0%	14%	0%	0%	3%	0%	2%	9%	15%	15%	15%	0%	0%
Lake Hayes/Shotover Country	26%	8%	0%	9%	13%	5%	3%	12%	14%	0%	0%	0%	2%	0%	2%	7%	12%	12%	12%	0%	0%
Skippers	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Glenorchy	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Arthurs Point	23%	6%	0%	7%	10%	5%	2%	1%	2%	1%	0%	0%	0%	0%	1%	3%	8%	8%	8%	0%	0%
Kingston	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Jacks Point	9%	2%	0%	4%	6%	10%	8%	4%	5%	5%	0%	0%	2%	0%	0%	5%	4%	7%	4%	0%	0%
Frankton South East	18%	8%	0%	6%	9%	10%	6%	9%	10%	8%	0%	0%	4%	0%	4%	0%	8%	10%	9%	0%	0%
Five Mile	31%	10%	0%	11%	16%	8%	6%	23%	27%	21%	0%	0%	8%	0%	3%	6%	0%	11%	0%	0%	0%
Airport	45%	15%	0%	18%	25%	20%	8%	28%	34%	30%	0%	0%	13%	0%	7%	11%	15%	0%	15%	0%	0%
Frankton North	31%	10%	0%	11%	16%	8%	7%	22%	27%	21%	0%	0%	8%	0%	3%	7%	0%	11%	0%	0%	0%
Speargrass	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Wanaka	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

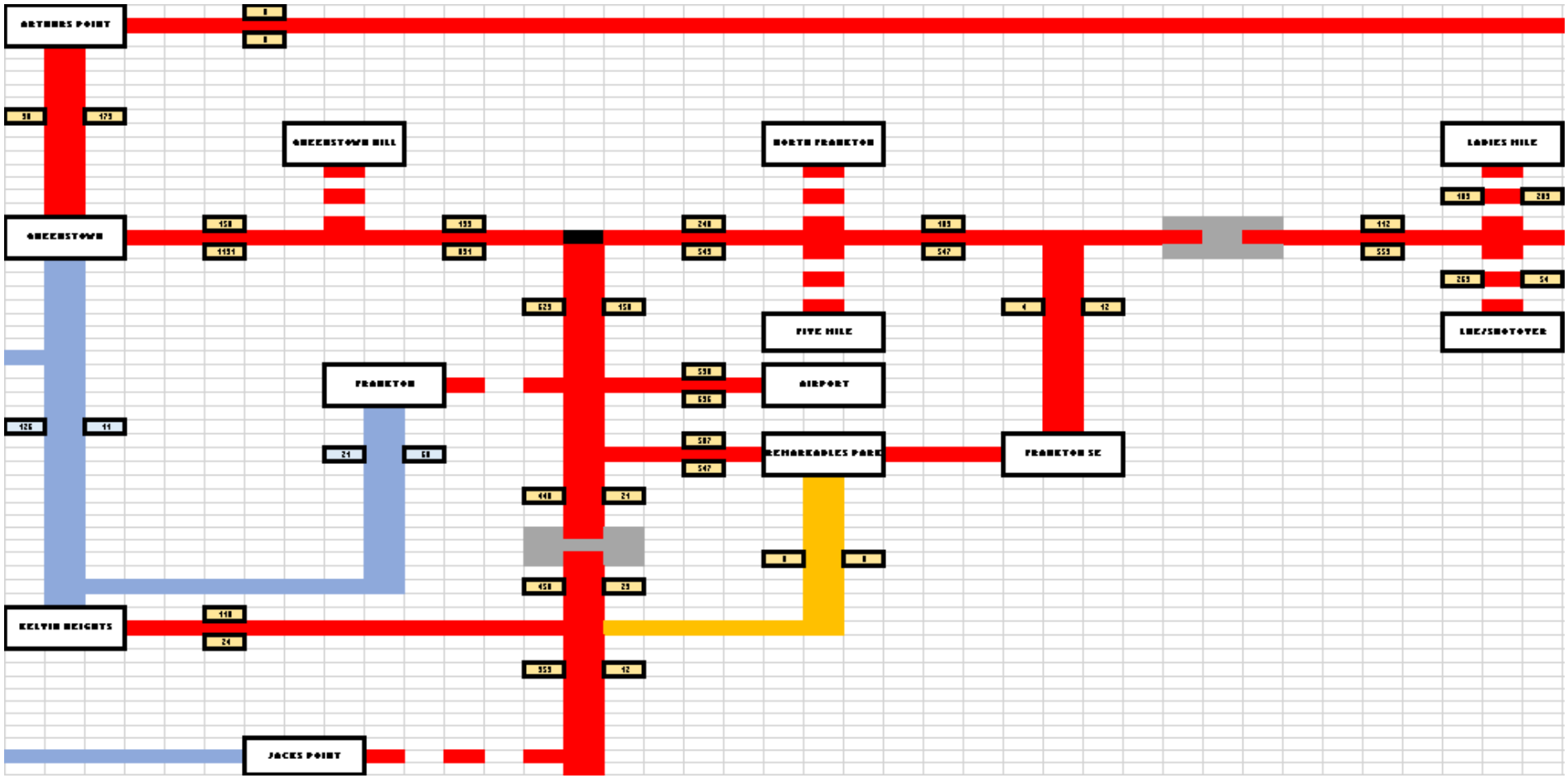
B8. Ferry percentage mode share by sector PM

Ferry Mode Share	Town Centre	Fernhill	Cromwell	Frankton Rd	Frankton	Remarkables	Kelvin Height	Arrowtown	Ladies Mile	Lake Hayes/S	Skippers	Glenorchy	Arthurs Point	Kingston	Jacks Point	Frankton Sou	Five Mile	Airport	Frankton Nor	Speargrass	Wanaka
Town Centre	0%	0%	0%	6%	9%	7%	53%	0%	0%	0%	0%	0%	0%	0%	0%	6%	2%	6%	2%	0%	0%
Fernhill	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Cromwell	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton Rd	4%	0%	0%	0%	4%	3%	17%	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	2%	1%	0%	0%
Frankton	4%	0%	0%	3%	0%	0%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Remarkables Park	2%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Kelvin Heights	13%	1%	0%	5%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%
Arrowtown	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Ladies Mile	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lake Hayes/Shotover Country	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Skippers	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Glenorchy	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Arthurs Point	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Kingston	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Jacks Point	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton South East	1%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Five Mile	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Airport	1%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Frankton North	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Speargrass	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Wanaka	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

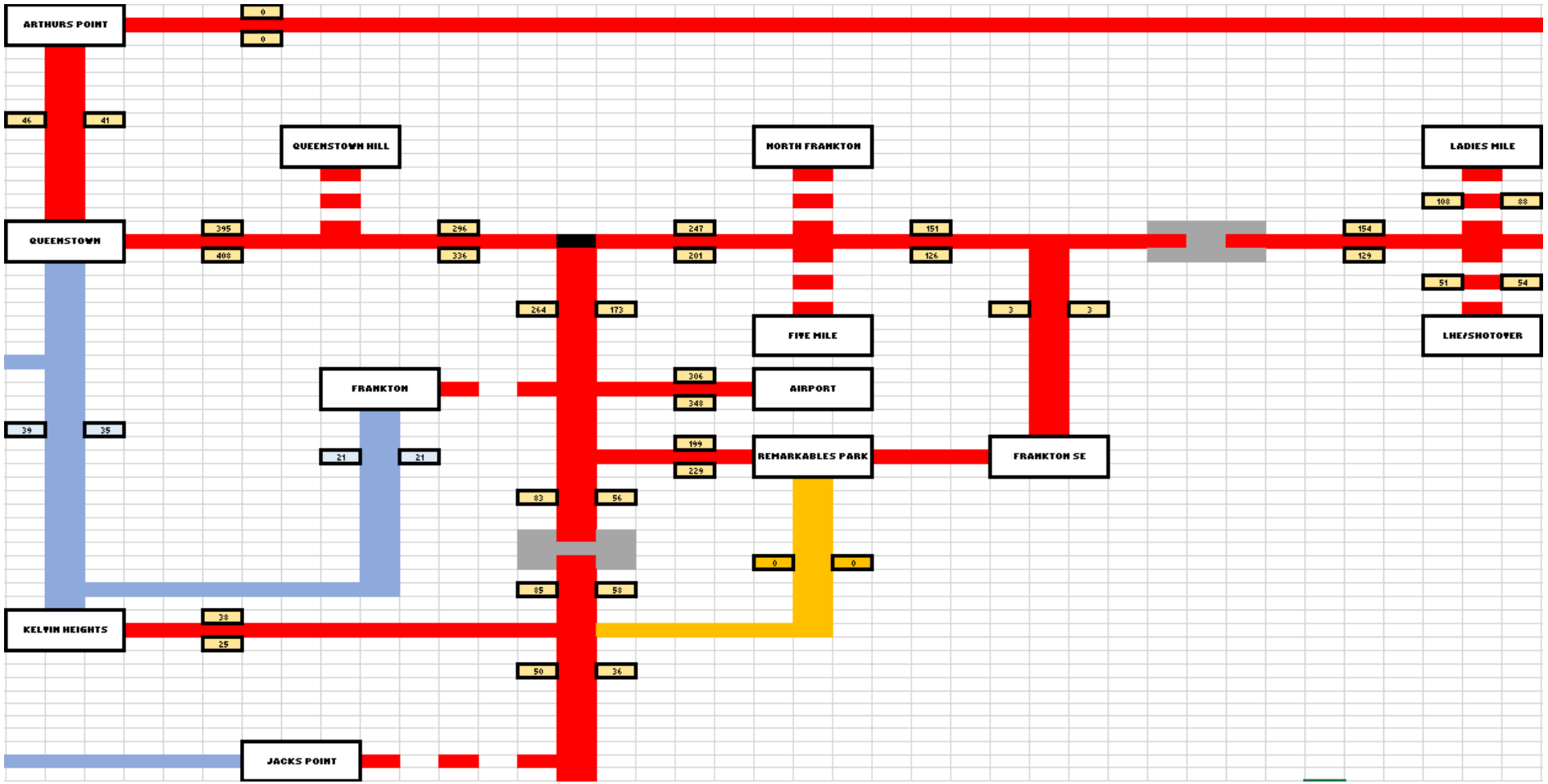
B9. Car percentage mode share by sector PM

Car Mode Share	Town Centre	Fernhill	Cromwell	Frankton Rd	Frankton	Remarkables	Kelvin Height	Arrowtown	Ladies Mile	Lake Hayes/S	Skippers	Glenorchy	Arthurs Point	Kingston	Jacks Point	Frankton Sou	Five Mile	Airport	Frankton Nor	Speargrass	Wanaka
Town Centre	100%	59%	100%	52%	42%	51%	37%	85%	45%	44%	100%	100%	61%	100%	90%	65%	52%	43%	52%	100%	100%
Fernhill	74%	100%	100%	92%	89%	93%	96%	98%	89%	87%	100%	100%	94%	100%	99%	95%	90%	94%	90%	100%	100%
Cromwell	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Frankton Rd	70%	92%	100%	100%	84%	88%	79%	88%	81%	85%	100%	100%	93%	100%	98%	93%	89%	85%	90%	100%	100%
Frankton	60%	88%	100%	84%	100%	85%	85%	76%	70%	77%	100%	100%	89%	100%	95%	92%	83%	80%	84%	100%	100%
Remarkables Park	81%	93%	100%	94%	88%	100%	85%	87%	90%	91%	100%	100%	94%	100%	93%	90%	89%	81%	89%	100%	100%
Kelvin Heights	73%	95%	100%	90%	86%	85%	100%	92%	89%	89%	100%	100%	96%	100%	94%	92%	91%	92%	91%	100%	100%
Arrowtown	86%	96%	100%	91%	85%	95%	97%	100%	84%	88%	100%	100%	98%	100%	99%	92%	86%	88%	86%	100%	100%
Ladies Mile	74%	92%	100%	89%	84%	94%	95%	85%	100%	86%	100%	100%	97%	100%	98%	91%	85%	85%	85%	100%	100%
Lake Hayes/Shotover Country	74%	92%	100%	91%	87%	95%	97%	88%	86%	100%	100%	100%	98%	100%	98%	93%	88%	88%	88%	100%	100%
Skippers	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Glenorchy	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Arthurs Point	77%	94%	100%	93%	90%	95%	98%	99%	98%	99%	100%	100%	100%	100%	99%	97%	92%	92%	92%	100%	100%
Kingston	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Jacks Point	91%	98%	100%	96%	94%	90%	92%	96%	95%	95%	100%	100%	98%	100%	100%	95%	96%	93%	96%	100%	100%
Frankton South East	81%	92%	100%	94%	91%	90%	93%	91%	90%	92%	100%	100%	96%	100%	96%	100%	92%	90%	91%	100%	100%
Five Mile	69%	90%	100%	89%	84%	92%	93%	77%	73%	79%	100%	100%	92%	100%	97%	94%	100%	89%	100%	100%	100%
Airport	54%	84%	100%	81%	75%	80%	91%	72%	66%	70%	100%	100%	87%	100%	93%	89%	85%	100%	85%	100%	100%
Frankton North	69%	90%	100%	89%	84%	92%	93%	78%	73%	79%	100%	100%	92%	100%	97%	93%	100%	89%	100%	100%	100%
Speargrass	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Wanaka	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

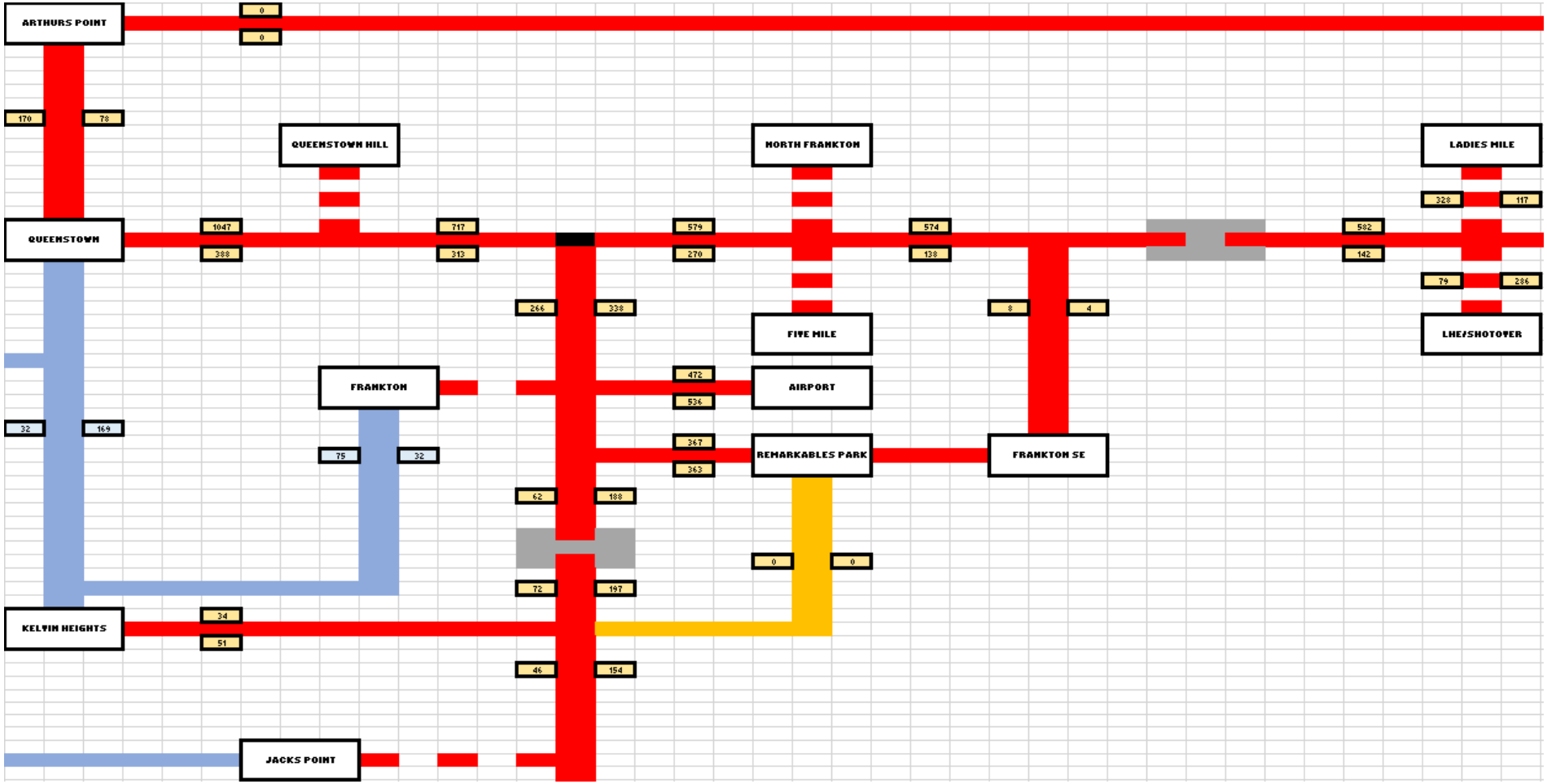
B10. Bus patronage on key corridors AM



B11. Bus patronage on key corridors IP



B12. Bus patronage on key corridors PM



B13. Mode share at key locations

1.3 Occupancy

Location	Direction	Passengers	2053 AM		2053 IP		2053 PM	
SH6A (Marina)	Eastbound	Car	1079	88%	1907	85%	2201	71%
		Bus	133	11%	296	13%	717	23%
		P&R	0	0%	0	0%	0	0%
		MRT	0	0%	0	0%	0	0%
		Water	11	1%	35	2%	169	5%
		Total	1224	100%	2238	100%	3087	100%
		DoS	64%		113%		130%	
	Westbound	Car	1945	66%	1905	84%	1733	83%
		Bus	891	30%	336	15%	313	15%
		P&R	0	0%	0	0%	0	0%
		MRT	0	0%	0	0%	0	0%
		Water	126	4%	39	2%	32	2%
		Total	2963	100%	2280	100%	2078	100%
		DoS	115%		113%		103%	
Shotover Bridge	Eastbound	Car	1290	92%	1792	92%	2216	79%
		Bus	112	8%	154	8%	582	21%
		P&R	0	0%	0	0%	0	0%
		MRT	0	0%	0	0%	0	0%
		Water	0	0%	0	0%	0	0%
		Total	1403	100%	1946	100%	2798	100%
		DoS	71%		98%		122%	
	Westbound	Car	2036	78%	1746	93%	1591	92%
		Bus	559	22%	129	7%	142	8%
		P&R	0	0%	0	0%	0	0%
		MRT	0	0%	0	0%	0	0%
		Water	0	0%	0	0%	0	0%
		Total	2595	100%	1875	100%	1733	100%
		DoS	120%		103%		94%	
Kawarau Falls Bridge	Southbound	Car	674	97%	1598	96%	2725	91%
		Bus	21	3%	56	3%	188	6%
		P&R	0	0%	0	0%	0	0%
		MRT	0	0%	0	0%	0	0%
		Water	2	0%	12	1%	85	3%
		Total	698	100%	1666	100%	2999	100%
		DoS	35%		82%		140%	
	Northbound	Car	2677	84%	1724	94%	1310	95%
		Bus	448	14%	83	5%	62	5%
		P&R	0	0%	0	0%	0	0%
		MRT	0	0%	0	0%	0	0%
		Water	72	2%	18	1%	7	1%
		Total	3197	100%	1824	100%	1380	100%
		DoS	137%		88%		67%	
Arthurs Point Crossing	Southbound	Car	902	84%	558	93%	507	87%
		Bus	173	16%	41	7%	78	13%
		P&R	0	0%	0	0%	0	0%
		MRT	0	0%	0	0%	0	0%
		Water	0	0%	0	0%	0	0%
		Total	1076	100%	599	100%	585	100%
		DoS	69%		43%		39%	
	Northbound	Car	402	91%	579	93%	745	81%
		Bus	38	9%	46	7%	170	19%
		P&R	0	0%	0	0%	0	0%
		MRT	0	0%	0	0%	0	0%
		Water	0	0%	0	0%	0	0%
		Total	439	100%	625	100%	915	100%
		DoS	31%		45%		57%	

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