

**BEFORE THE HEARINGS PANEL
FOR THE PROPOSED QUEENSTOWN LAKES DISTRICT PLAN**

IN THE MATTER of the Resource
Management Act 1991

AND

IN THE MATTER of Hearing Stream 14:
Wakatipu Basin hearing
and transferred Stage 1
submissions related to
Arrowtown and Lake
Hayes

**STATEMENT OF EVIDENCE OF DAVID JOHN ROBERT SMITH
ON BEHALF OF QUEENSTOWN LAKES DISTRICT COUNCIL**

Traffic and Transportation

28 May 2018



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1. INTRODUCTION

- 1.1 My full name is David John Robert Smith. I hold the position of Associate Transportation Planner at Abley. I have been in this position since 2012.
- 1.2 I hold a Bachelor of Technology (with Honours) in Industrial Operations Research and Master of Philosophy in Operations Research from Massey University. I am a Chartered Member of the Institute of Logistics and Transport, a member of Engineering New Zealand (**ENZ**) and a member of the NZ Modelling User Group sub-group of ENZ.
- 1.3 I have 18 years of transportation planning and modelling experience. I was engaged by the Environmental Protection Authority (**EPA**) to provide transportation advice and evidence directly to the Board of Inquiry presiding over the Basin Bridge hearing. I recently managed, and was technical lead for, the Queenstown Integrated Transport Programme Business Case, and have managed and been technical lead on a number of other high profile transportation planning and modelling projects for both public and private sector clients. I have developed, maintained and applied transportation models throughout New Zealand, Australia and Malaysia.
- 1.4 I have maintained and managed the Queenstown-Lakes Tracks Transportation Model (**Transportation Model**) for Queenstown-Lakes District Council (**QLDC**) since 2012. In 2017, I updated the Transportation Model to reflect recent changes in the District. I have since used the Transportation Model to inform the Queenstown Town Centre Masterplan business case work led by QLDC, as well as a number of other transport planning projects for both New Zealand Transport Agency (**NZTA**) and QLDC.
- 1.5 My current role at Abley involves managing and undertaking a lead technical role on a range of development planning and transportation planning projects for both public and private sector clients and leading the transportation planning business area at Abley.

- 1.6** In relation to the Proposed District Plan (**PDP**) I have been asked by QLDC to provide evidence in relation to traffic and transportation matters for Hearing Stream 14. My evidence relates to the consideration of traffic and transportation effects that are likely to occur if submissions requesting the rezoning of land within the Wakatipu Basin (addressed as part of these Stage 2 hearings), were to be approved.
- 1.7** Although this is a Council hearing, I confirm that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014 and that I agree to comply with it. I confirm that I have considered all the material facts that I am aware of that might alter or detract from the opinions that I express, and that this evidence is within my area of expertise, except where I state that I am relying on the evidence of another person.
- 1.8** The key documents I have used, or referred to, in forming my view while preparing this brief of evidence are:
- (a) QLDC Proposed District Plan (**PDP**): Chapter 24 Wakatipu Basin; and
 - (b) A copy of individual submissions accessed online or received from QLDC Planning staff; and
 - (c) Geospatial layers received from QLDC identifying the location of the geographic boundaries associated with zoning under the PDP and submissions.
- 1.9** Attached to my evidence are the following:
- (a) **Attachment A:** Peak period Level of service plots for the Wakatipu Basin;
 - (b) **Attachment B:** Shotover River Bridges Capacity Analysis technical note; and
 - (c) **Attachment C:** Plots of geographic extents of zones corresponding to the PDP and submissions.

2. SCOPE

2.1 My evidence addresses the following matters:

- (a) the proposed PDP zoning for the Wakatipu Basin;
- (b) the impact of Special Housing Areas (**SHAs**) in the vicinity of the Wakatipu Basin;
- (c) the role of passenger transport and active modes of transport in addressing traffic and transportation effects;
- (d) the impact of increased or decreased levels of transport activity arising from the rezoning requests received through submissions;
- (e) an assessment of specific submissions that request rezoning which QLDC has asked me to specifically consider, being submission numbers 2129, 2171, 2299, 2332, 2387 and 2397; and
- (f) an assessment of additional submissions which have been deferred from PDP Stage 1 relating to Ladies Mile SHAs and adjacent land parcels along Frankton Ladies Mile Highway, that is PDP Stage 1 submissions 239, 277, 404, 451, 492, 528, 532, 535, 655, 838, 842 and 850.

3. EXECUTIVE SUMMARY

3.1 The Queenstown area is experiencing unprecedented levels of population, employment and tourism growth, which has led to significant congestion and declining travel time reliability for private and public transport on key journeys.

3.2 The Queenstown Integrated Transport Programme Business Case (**Business Case**) seeks to address these challenges through a limited package of infrastructure responses and a heavy reliance on public transport initiatives and behaviour change to move away from a reliance on the current private vehicle use around the District.

3.3 I have identified that with the level of development as notified in the PDP, there are several key locations that need additional roading

capacity or less travel demand in order to achieve satisfactory road network performance, as follows:

- (a) State Highway 6 westbound between Howard Drive and Hawthorne Drive in the morning and evening peak periods;
- (b) State Highway 6 eastbound between Hawthorne Drive and Howard Drive in the evening peak period;
- (c) Intersection of SH6 and Arrowtown-Lake Hayes Road (known locally as Arrow Junction) in the evening peak period; and
- (d) The Edith Cavell one lane bridge on Arthurs Point Road.

3.4 With respect to the SH6 Shotover River Bridge network and the approaches to this bridge, the approval of any submissions that propose to increase density in the Wakatipu Basin will exacerbate congestion at this key location, to the contrary, the approval of any of the submissions which propose to reduce density will lessen those effects.

3.5 Many of the submissions relate to relatively small increases in activity, which in isolation would have no noticeable effect on the performance of the transport network. However, there is a risk of cumulative effects if a number of these submissions are approved together

3.6 On this basis, without appropriate mitigation being sought to address effects along the SH6 corridor in the vicinity of the Shotover River Bridge, Edith Cavell Bridge and Arrow Junction, I oppose (on the basis of transportation effects) all submissions that seek to increase residential density beyond that provided for in the notified Wakatipu Basin Chapter and plan maps. Appreciating this is not a matter for the District Plan, I also consider that NZTA should be consulted, where appropriate, regarding future projects along the SH6 Ladies Mile corridor including the Shotover River Bridge.

3.7 In considering the notified Stage 2 provisions and zoning, and the rezoning requests received through submissions on Stage 2, I have:

- (a) embraced the principles of the Business Case, which outlines the programme of future transport works for the next 30 years;

- (b) considered the key transport network constraints within the District; and
- (c) acknowledged the current commitments to infrastructure investment by the Business Case partners.

3.8 The Transportation Model has been used to undertake the technical assessment that informs my position in relation to the rezoning requests made through submissions.

3.9 I understand that the Regional Land Transport Plan (**RLTP**) has funding set aside to plan for an additional crossing near the Edith Cavell Bridge at Arthurs Point, near Queenstown, for all modes. I also understand that the plans to address future capacity issues at this location in the RLTP, are limited to \$500,000 for *“initial work associated with an additional crossing near the Edith Cavell bridge at Arthurs Point, near Queenstown, for all modes.”*

3.10 Any application that provides for additional residential development along Ladies Mile will create significant traffic effects along SH6, including the SH6 Shotover River Bridge. Any significant addition of capacity at this location will be expensive and require several years to plan, design and construct a solution, and will be a process led by NZTA as the road controlling authority.

3.11 Recent investment in public transport services throughout the District, including a significant reduction in bus fares and changes to parking in the Queenstown Town Centre, has resulted in a recent increase in public transport usage. Public transport can have a role in deferring the need for infrastructure investment but does not preclude the need to provide for additional capacity over the Shotover River.

3.12 The area of the Wakatipu Basin where the rezoning requests have been received is situated up to 21km and 15km east of the Queenstown and Frankton urban centres respectively. Analysis of New Zealand travel data leads me to conclude that very few persons are likely to use walking and cycling to access these urban centres from the Wakatipu Basin.

4. TRANSPORT PLANNING IN QUEENSTOWN

4.1 I was the project manager and transport planning lead for the delivery of the Business Case, prepared under my direction for and in collaboration with NZTA, QLDC and Otago Regional Council (**ORC**).

4.2 Some of the key observations made in the Business Case, which I believe are relevant to providing an understanding of the current state of the Queenstown transport network, are as follows:

- (a) The Queenstown area is experiencing unprecedented levels of population growth, having increased by 65% between 2001 and 2013, with further increases since then;
- (b) The employment growth over this period is 3.4% per annum, compared to a national rate of 1.2% since 2005;
- (c) Visitor numbers through Queenstown airport have increased by 200% since 2005 to nearly 1.8 million passengers in the year to June 2017;
- (d) The extremely high level of growth in Queenstown has led to significant congestion and declining travel time reliability for private and public transport on key journeys;
- (e) The transport system has not been able to keep up with growth, and only limited improvements in infrastructure and services have been made since 2006; and
- (f) Traditional transport strategies and response to growth will no longer work in the Queenstown environment. A fundamental change in thinking and approach is required.

4.3 The cornerstone of the Business Case is set out in the following two problem statements, which carefully articulate the transport challenges faced in the Queenstown, Frankton and surrounding development areas:

“Problem Statement 1: The significant growth in visitors, residents and vehicles, leads to increasing trip unreliability and worsening customer experience across the network.

Problem Statement 2: Car dominance and associated congestion is affecting the liveability and attractiveness of the area.”

- 4.4** Acknowledging that the topography of Queenstown and the Wakatipu Basin and availability of land constrains a range of responses, the Business Case delivered a programme of works to address these problem statements, including a limited package of infrastructure responses. However, the Business Case relied heavily on public transport initiatives and behaviour change measures to move away from a reliance on the current private vehicle use.
- 4.5** The Business Case also identified several strategic planning measures that would support the programme, including increasing the density of land use in urban areas and enabling sustainable travel-orientated development, proposing that these principles can be delivered by taking a *“more integrated approach to the strategic planning of transport and land use.”*
- 4.6** In my consideration of the notified PDP (Stage 2) and rezoning requests received through submissions for land within the Wakatipu Basin, I have embraced these principles, considered the key transport network constraints within the District and acknowledged the current commitments to infrastructure investment by the Business Case partners.

5. METHODOLOGY AND ASSUMPTIONS

- 5.1** The Transportation Model, which is managed under my direction by the modelling team at Abley and which has been recently updated, has been used to undertake the technical assessment that informs my position with regard to the rezoning requests received through submissions on the PDP Stage 2. QLDC and NZTA use the model as a transportation planning tool to model the effects of future landuse and traffic growth in the District and plan transport infrastructure requirements to accommodate future travel demands.
- 5.2** In 2012 a team at Abley, under my direction, updated the Transportation Model from the existing base year of 2006 to reflect the operation of the transport network based on land use and traffic activities occurring in 2012. Abley also developed future transport

models for 2026 and 2041, to reflect the most recent aspirations for land use and transport network development in the District.

5.3 The Transportation Model was again updated by the Abley team in March 2017 to reflect a base year of 2016 and future years of 2025 and 2045 to ensure they continue to reflect the most recent development aspirations in the District.

5.4 The Transportation Model is a summer season model and, as such, reflects the “typical” weekday traffic demands for October through March, when summer tourist activities and peak seasonal demands are occurring. It models three periods during the weekday, including the morning peak from 7am to 9am, the interpeak from 9am to 4pm and the evening peak from 4pm to 6pm. The Transportation Model uses traffic count profiles from State Highway 6A to convert the three weekday periods into a model representing daily traffic flows.

5.5 The 2045 morning and evening peak period models have been used to demonstrate the long-term effects of development in the Wakatipu Basin, and inform my position with respect to the rezoning requests with the following technical tasks being undertaken:

- (a) Update the 2045 model inputs to reflect the maximum level of development achievable under the notified Stage 2 PDP zonings for the Wakatipu Basin Lifestyle Precinct (**Precinct**) and Wakatipu Basin Rural Amenity Zone (**Amenity Zone**).¹ The location of the geographic areas corresponding to the Precinct and Amenity Zone are shown in page 1 of **Attachment C**;
- (b) Run the 2045 morning and evening peak transport models to identify deficiencies in the transport network and corresponding infrastructure requirements;
- (c) Consider the impact of additional growth including Special Housing Areas in the vicinity of SH6 Ladies Mile on the transport network deficiencies identified in (b);

¹ I note that the modelled assumptions for development elsewhere throughout the District are consistent with Queenstown-Lakes District Growth Projects 2018-2058 published in August 2016 by Rationale consultants. These future landuse inputs correspond to the most recently updated and available transportation model for this evaluation.

- (d) Determine the extent to which the approval of rezoning requests that propose to either intensify ('up-zone') or reduce ('down-zone') residential development in the Wakatipu Basin, will impact on transport network performance and infrastructure requirements; and
- (e) Consider the role of public transport and active modes in reducing dependence on vehicle driver trips generated in the Wakatipu Basin.

5.6 In updating and running the Transportation Model to reflect the effects of the notified zoning in Stage 2 of the PDP (focusing on the Wakatipu Basin) the following assumptions were made:

- (a) To provide a robust assessment of effects, an average density of one lot per hectare was assumed in the notified Precinct and the maximum density permissible of one lot per 80 hectares was assumed in the Amenity Zone. It is noted that multiple building footprints may be developable on each lot, however consideration in this regard can be addressed at the Resource Consent stage and was not considered further in the Transportation Model.
- (b) Future household occupancy in the Wakatipu Basin would be largely unchanged from current household occupancy levels, which according to Statistics New Zealand 2013 census data are typically in the range of 70-80%. Subsequently it is assumed that on a typical day 75% of dwellings would be occupied.
- (c) Future transport mode share is largely unchanged from current mode share, that is the proportion of trips taken by private vehicle, public transport and active (walking and cycling) modes remains consistent in the future. This is a conservative assumption which is revisited later in my evidence.
- (d) I note from the evidence of Craig Barr for QLDC that a rural residential lifestyle zone such as the Wakatipu Basin Lifestyle Precinct is expected to be subdivided and developed gradually over time and (like other rural zones) it is unlikely to

be built out to its ultimate capacity in the 10 year expected lifetime of the PDP.

6. BACKGROUND INFRASTRUCTURE

6.1 The most recent RLTP is the Otago Southland Regional Land Transport Plans 2015-2021. This includes road infrastructure projects planned for the southern part of the South Island and includes regional council and NZTA projects. The projects listed for Queenstown District urban areas and the Wakatipu Basin are listed in the table below.

Priority Band	Programme Item No	Project Name	Organisation
1	44	Grant Road to Kawarau Falls Bridge Improvements	NZTA
1	96	Frankton Flats Programme Business Case Implementation	QLDC
1	95	Eastern Arterial Road	QLDC
1	55	Nevis Bluff Rockfall Protection	NZTA
1	74	Public Transport Inter-Regional Ticketing Improvement, Otago	ORC
1	108	Queenstown Town Centre Programme Business Case Implementation	QLDC
2	66	Stanley St Corridor Improvements	NZTA
2	48	Ladies Mile Corridor Improvements	NZTA
2	64	SH6A Corridor Improvements	NZTA

6.2 More recent documents are currently out for consultation, including a variation to the RLTP and the draft QLDC Ten Year Plan. Both documents refer to duplication of the single lane bridge in Arthurs Point as a future project, with investigation starting in 2020 and construction occurring near the end of the ten-year period. At this stage I am not aware of any proposed project, or funding set aside, to increase capacity at the SH6 Shotover River Bridge.

7. ANALYSIS OF NOTIFIED STAGE 2 ZONES AND IMPACTS OF INCREASED DEVELOPMENT ON KEY TRANSPORT CORRIDORS WITHIN THE WAKATIPU BASIN

Update to the Transportation Model to reflect 2045 conditions / level of service within the District

7.1 The 2045 morning peak and evening peak models have been run to reflect the full development potential of the Precinct and the Amenity

Zone as notified (i.e. prior to rezoning requests through submissions), and based on the notified version of the Wakatipu Basin chapter. This has been done by allocating households to the transport model zones to reflect the number of occupied dwellings that can be developed in the Wakatipu Basin. This equates to a total of 1557 lots in total and, at an assumed average household occupancy rate of 75%, a total of 1168 occupied dwellings were added to the Transportation Model by loading them into the nearest model zone. Care was taken to ensure that there was no double counting of existing households within the Basin's geographic boundaries.

7.2 I have not modelled the baseline capacity of the Basin under the previous Operative District Plan (**ODP**) provisions as the previous provisions do not include minimum lot sizes, therefore it is not practical to model this as a baseline. For this reason, the Wakatipu Basin variation proposals under the PDP Stage 2 form the baseline for my assessment of traffic and transportation effects. I also note that cumulative impacts on the capacity of the transport network have not previously been addressed for development in the Wakatipu Basin.

7.3 The future (2045) hourly traffic volumes were extracted from the Transportation Model at key locations and are presented in the table below.

Road/Period	AM Peak Hour			PM Peak Hour		
	Wstbnd/ Sthbnd	Estbnd/ Nthbnd	Total	Wstbnd/ Sthbnd	Estbnd/ Nthbnd	Total
SH6 at Shotover Bridge	1650	730	2380	1210	1820	3030
SH6 east of Stalker Rd	1280	610	1890	1000	1380	2380
SH6 east of Arrow Junction	550	410	960	650	610	1260
Edith Cavell Bridge	630	260	890	400	710	1110
McDonnell Rd - North of Arrow Jn	190	160	350	170	200	370
Arrowtown-Lake Hayes Rd - North of SH6	340	240	580	310	360	670

7.4 Level of Service (**LOS**) plots were also extracted for the Wakatipu Basin and are attached to this statement of evidence as **Attachment A**.

7.5 LOS is a concept used by traffic engineers and transport planners to objectively classify the extent of congestion on a roadway or at an intersection. LOS A represents largely free flow conditions and LOS F represents oversaturated conditions (put simply, where demand exceeds supply).

7.6 Descriptions of LOS are presented in Austroads Guide to Traffic Management Part 3 (2017 edition) sections 4 and 5 for rural and urban facilities respectively. A concise description adapted from this source of each classification is as follows:

LOS A	Primarily free-flow operation
LOS B	Reasonably unimpeded operation
LOS C	Stable operation
LOS D	A less stable condition in which small increases in flow may cause substantial increases in delay and decreases in travel speed
LOS E	Characterised by unstable operation and significant delay
LOS F	Characterised by flow at extremely low speed. Congestion is likely occurring at the boundary intersections, as indicated by high delay

7.7 Network performance at LOS E and F exhibit, in my view, significant network congestion and highlight the need to add roading capacity or remove demand in order to achieve satisfactory road network performance.

7.8 The LOS plots in **Attachment A** demonstrate the following network deficiencies at modelled year 2045:

- (a) State Highway 6 westbound between Howard Drive and Hawthorne Drive in the morning and evening peak periods (LOS E/F);
- (b) State Highway 6 eastbound between Hawthorne Drive and Howard Drive in the evening peak period (LOS E/F); and
- (c) Intersection of SH6 and Arrowtown-Lake Hayes Road in the evening peak period (LOS F).

- 7.9** It is further noted that the one lane Edith Cavell Bridge on Arthurs Point Road is currently near capacity. This, and proposed improvements to SH6, are addressed in the following paragraphs.

State Highway 6 Improvements

- 7.10** The capacity of the SH6 Shotover River Bridge, including the two-lane / two-way approaches, has been calculated to be 1590 vehicles per lane per hour using the methodology described in the technical note included as **Attachment B** to this statement of evidence.
- 7.11** The 2045 modelling suggests that westbound traffic volumes in the morning peak with the addition of the notified Stage 2 zoning will exceed 1600 vehicles per hour; and that eastbound volumes will reach approximately 1800 vehicles per hour in the evening peak. Subsequently, the Shotover Bridge will be operating at capacity at around year 2035 with the notified zoning under Stage 1 (for the land in consideration) and Stage 2 of the PDP (refer Table 4.1 of **Attachment B**).

Edith Cavell Bridge Improvements

- 7.12** In early 2018 a variation to the RLTP was released for consultation which included updated project costings or timelines and new projects not previously considered.
- 7.13** A key new project for the Wakatipu Basin is the Shotover River Bridge (Arthurs Point) Duplication or Item number 72 in the RLTP variation. The RLTP set aside \$500,000 in 2020 for initial work associated with an additional crossing near the Edith Cavell Bridge at Arthurs Point, for all modes.
- 7.14** This is also addressed in the draft QLDC Ten Year Plan 2018-2028, which is also out for consultation. This has \$39.6M in funding allocated from 2020 to 2031 so construction of a duplicated bridge, if approved in the final Ten Year Plan, could start within this window.

- 7.15** In 1994 the US Transport Research Board released a “Research Report”² into the traffic control treatment at road works sites which provides guidance on how to control two-way single lane sections. The report provides guidance that recommends thresholds at which signal control for a one lane section of road is required based on the hourly approach traffic flows and the average time to clear the one lane section.
- 7.16** Assuming a mean travel speed across the bridge of 20-25 km/h I have calculated that the average clearance time would be approximately 15 seconds. I have sourced a traffic count from QLDC which demonstrates that in June 2017 a total of 4960 vehicles crossed the Edith Cavell Bridge per day which corresponds to 730 vehicles two-way in peak hour. I consider this to be at the threshold whereby signalised control is required for the efficient use of the bridge.
- 7.17** The Transportation Model calculates that the 2045 baseline volume across the bridge will be approximately 1100 vehicles two-way per hour. I have further calculated, based on Table 3.3 of the Research Report, that the average delays during peak periods in 2045 for a one lane bridge with signalised control would be approximately 120 seconds. This analysis in my view, confirms the need for a new bridge well before 2045 and highlights the potential shift to signal control as traffic growth continues to occur in the short term.
- 7.18** Any further development within the District, such as that enabled by the approval of submissions that request rezoning (intensification), has the effect of bringing forward the requirement for a duplicate bridge, and the threshold for signalisation when delays become unstable resulting in unreliable travel times.

Impact of Special Housing Areas

- 7.19** The technical analysis presented in **Attachment B** also addresses the modelled effects of additional development coming on stream from Special Housing Areas (**SHA**) adjacent to SH6 Ladies Mile highway.

2 National Highway Cooperative Research Program report 358 “Recommended practices for use of traffic barrier and control treatments for restricted work zones.”

Whilst the SHAs sit outside the District Plan review process it is in my view important to consider the likely effects of these developments should they eventuate, and the likely effects on the performance of the Shotover River Bridge, which is expected to reach capacity at around 2035 in any event.

- 7.20** The specific capacity of any SHA along Ladies Mile highway is unknown, however it is understood that this may be over 1000 households and therefore the impact of 1000 or 2000 households is assumed in the assessment to consider the extent to which this level of development affects the timing of any upgrade at the SH6 Shotover River Bridge. Also, for the purposes of this analysis it is assumed that the corresponding SHAs would be developed over the next seven years and be complete by 2025.
- 7.21** If an additional 1000 dwellings were developed by 2025 in the SHA, the bridge will reach capacity approximately 12 years earlier at 2023. If 2000 dwellings were to be developed by 2025, the bridge would reach capacity as early as 2021. If this were to occur, in my view, the planning of an upgrade (such as duplication or replacement of the existing bridge with a four-lane structure) would need to be well advanced now and under construction shortly.
- 7.22** As I understand it, there are currently no plans to address future capacity issues at the Shotover River Bridge. As a result, any application that provides for additional residential development along Ladies Mile will in my view create significant traffic effects along SH6. The addition of capacity at this location will be expensive and require several years to plan, design and construct a solution, and will be a process led by NZTA as the relevant road controlling authority.

Impact of Submissions seeking a change in zone

- 7.23** Similar scenarios (to those involving SHAs) can be developed in relation to additional residential development that may occur within the Wakatipu Basin through the approval of rezoning requests received through submissions on the Amenity Zone and Precinct, in Stage 2. While there were a small number of submissions seeking to reduce the

density of development in the Basin, generally the submissions on the Wakatipu Basin seek to increase the density of development proposed by the PDP (Stage 2). I note at the outset that essentially all of the Stage 2 land notified as either Amenity Zone or Precinct, is subject to a rezoning submission or multiple submissions as shown in the submission overlay plot included as page 2 of **Attachment C**.

- 7.24** Analysis of the Transportation Model, as reported in **Attachment B**, demonstrates that for each additional household developed within the Wakatipu Basin to the east of the Shotover River, the following number of additional peak hour trips are added to the two river crossings.

River Crossing	Peak hour trips per additional household	
	AM peak hour westbound	PM peak hour eastbound
Edith Cavell Bridge	0.08	0.10
SH6 Shotover River Bridge	0.25	0.28
Both bridges	0.33	0.38

- 7.25** The number of additional households sought by the rezoning requests can be multiplied by the trip rates in this table to enable an assessment of the likely effects on the relevant bridges. For example, an additional 500 households (above the notified position) would correspond to 375 occupied dwellings (at 75% occupancy rate) and would likely result in 105 and 38 additional eastbound trips in the critical evening peak hour on the SH6 Shotover River Bridge and the Edith Cavell Bridge respectively.
- 7.26** Development adjacent to the SH6 corridor can be expected to impact primarily on the SH6 Shotover River Bridge with approximately 0.33 westbound trips in the morning peak hour and 0.38 eastbound trips in the evening peak hour, and have little or no noticeable effect on traffic volumes on the Edith Cavell Bridge.
- 7.27** Conversely, any increased development adjacent to the Arthurs Point Road and western end of the Malaghans Road corridor can be expected to impact primarily on the Edith Cavell Bridge, with approximately 0.33 westbound trips in the morning peak hour and 0.38

eastbound trips in the evening peak hour, and have little or no noticeable effect on traffic volumes on the SH6 Shotover River Bridge.

8. THE ROLE OF PUBLIC TRANSPORT

- 8.1** Recent investment in public transport services throughout the District, including a significant reduction in bus fares and changes to parking in the Queenstown Town Centre, has resulted in a recent increase in public transport usage. There are currently scheduled bus services which service Arrowtown, providing hourly services along the Arrowtown-Lake Hayes Road and SH6 Ladies Mile corridors to connect to Frankton and Queenstown urban areas. A fully occupied standard bus holds approximately 50 passengers, therefore there is currently capacity for up to 50 persons per hour to use public transport in this catchment (noting that the actual hourly number of patrons is not known to me).
- 8.2** A scenario has been run by which 10% of current road users switch to public transport in the future during peak periods. Based on a future demand of up to 1700 vehicles per hour in peak flow direction in the evening peak, this would be equivalent to 170 further public transport users, or three to four additional fully-occupied 50 seater bus services operating every hour.
- 8.3** The outcome of additional take up in public transport usage, whereby 10% of vehicle drivers switch modes, pushes out the year at which the Shotover River Bridge reaches capacity by eight years from 2035 to 2043. However, if 1000 additional households were also developed through a SHA (or similar process) or up-zoning by 2025, the bridge reaches capacity by 2027. As such, public transport has a key role in deferring the need for infrastructure investment but in my view does not preclude the need to provide for additional capacity over the Shotover River.
- 8.4** It is further noted that while buses and private vehicles share the same constrained infrastructure (with buses using all main routes with private vehicles, including the Shotover River Bridge), there is little incentive for vehicle drivers to opt for public transport. The provision of bus

priority measures in the future (i.e. designated bus lanes) may provide some incentive in that regard, however there are currently no plans that I am aware of to provide such facilities along SH6 to the east of Frankton.

9. THE ROLE OF ACTIVE TRAVEL MODES

9.1 The Ministry of Transport's New Zealand Household Travel Survey (NZHTS) has been analysed to determine the extent to which pedestrians and cyclists are likely to use these active modes over significant distances to destinations. The analysis focused on a two-year travel data set (from 1st October 2015 to 15th August 2017 inclusive), which has been collated nationwide and records participants' travel patterns over a continuous seven day period.

9.2 I consider this analysis to be important due to the relatively remote location of many of the rezoning requests from key employment, education, shopping and recreational activities within the Queenstown-Lakes District.

9.3 The 50th, 75th, 85th and 95th percentile travel distance in kilometres for all walking and cycling trips recorded in the NZHTS are summarised in the below table. The table demonstrates that the median (50th percentile) trip distance is 0.5km and 2.1km for walking and cycling trips respectively, and 95% of all trip distances are less than 2.6km and 12.1km for walking and cycling trips respectively.

Mode of transport	Percentile distance of trip (km)			
	50 th	75 th	85 th	95 th
Walking trips	0.5	1.0	1.4	2.6
Cycling trips	2.1	4.6	7.1	12.0

9.4 The area of the Wakatipu Basin where the rezoning requests have been received is situated to the east of the Queenstown and Frankton urban centres. The SH6 Stalker Road roundabout, which is located at the western end of the SH6 Ladies Mile corridor, is situated approximately 5km from the SH6 / SH6A intersection (known locally as

the BP roundabout) in Frankton (following the Queenstown Trail cycleway) and 11km from the Queenstown Town Centre.

9.5 The 95th percentile walking trip distance of 2.6km is significantly less than these values, which demonstrates it is very unlikely that walking will be selected as a mode of transport to access key activities in Frankton or Queenstown. The 75th percentile cycling trip length of 4.6km shows that there is some likelihood that cyclists would have a propensity to travel from Ladies Mile to Frankton, however the 95th percentile cycling trip length of 12.0km indicates that only very few cyclists would be likely to access the Queenstown Town Centre from Ladies Mile.

9.6 It is further noted that some rezoning requests relate to land located as far as an additional 10km further to the east or north of the Stalker Road roundabout so are up to 15km and 21km away from the Frankton and Queenstown town centres.

10. ADDRESSING REZONING REQUESTS

10.1 The technical analysis described above has identified the following three network deficiencies prior to 2045, assuming complete development of the Wakatipu Basin as is permissible under the PDP Stage 2 provisions as notified:

- (a) State Highway 6 westbound between Howard Drive and Hawthorne Drive in the morning and evening peak periods;
- (b) State Highway 6 eastbound between Hawthorne Drive and Howard Drive in the evening peak period; and
- (c) Intersection of SH6 and Arrowtown-Lake Hayes Road in the evening peak period (Arrow Junction).

10.2 The approval of any submissions that seek to increase density in the Wakatipu Basin will exacerbate congestion at these locations, however the approval of any submissions which seek to reduce density will lessen those effects.

- 10.3** Many of the submissions relate to relatively small increases in activity, which in isolation would have no noticeable effect on the performance of the transport network. However, there is a risk of cumulative effects if a number of these submissions are approved together.
- 10.4** On this basis, without appropriate mitigation being sought to address effects along the SH6 corridor in the vicinity of the Shotover River Bridge, Edith Cavell Bridge and Arrow Junction, I oppose (on the basis of transportation effects) all submissions that seek to increase residential density beyond that provided for in the notified Stage 2 Wakatipu Basin Chapter and plan maps. Appreciating this is not a matter for the District Plan, I also consider that NZTA should be consulted, where appropriate, regarding future projects along the SH6 Ladies Mile corridor including the Shotover River Bridge.
- 10.5** This notwithstanding, QLDC has asked me to specifically consider several submissions in isolation, which I have addressed in the following sections. The geographic location of these submissions is shown in page 2 of **Attachment C**.

11. QUEENSTOWN LAKES COMMUNITY HOUSING TRUST (2299)

- 11.1** Submitter 2299 has sought that Part Lot 1 DP 300390 and Lot 2 DP 300390 is rezoned from Amenity Zone to Low Density Residential, and included in the Arrowtown Urban Growth Boundary. Lot 2 is on the current boundary of the Amenity Zone. No transport assessment was provided with the submission.
- 11.2** Lot 2 DP 300390 is Council-owned and I understand has previously been identified as a potential location for affordable housing. A Master Plan, developed by the Queenstown Lakes Housing Trust, identifies 67 possible lots. Analysis provided by Council planners suggests that the potential yield is 102 lots.
- 11.3** The site is located on the edge of the urban boundary of Arrowtown, and is accessed from Jopp Street. Jopp Street is a narrow urban street that provides access to approximately 40 existing households. The

street does not have footpaths, road markings or lighting. It is approximately 6.5 - 7.5m in width and has a relatively flat gradient.

- 11.4** Jopp Street connects onto Centennial Avenue in the 50 km/hr speed limit zone, but in close proximity to the 100 km/hr speed limit zone. Centennial Avenue is one of the two main entrances into Arrowtown. Centennial Avenue also links into SH6 via McDonnell Road, providing connection to Queenstown.
- 11.5** I consider that the rezoning request could be accommodated into the local network without any significant impact on the safety and efficiency of the local road network. However, access onto Jopp Street would likely need to be upgraded before any development occurred. The access upgrade could be formed with proper design, although there is potential that Jopp Street itself may require widening or minor improvements to cater for the additional demand and this could be addressed in the Resource Consent process. The intersection between Jopp Street and Centennial Avenue does not present a significant safety concern, aside for the potential of vehicles travelling at a higher speed than the speed limit due to the close proximity to the speed limit change. The actual vehicle speed may be difficult to judge for drivers exiting Jopp Street. This is the current situation, and could be addressed through minor engineering interventions if this becomes a real problem. The intersection has long clear sight distances to assist in the safe navigation of the intersection.
- 11.6** Given the location of the subject Lot, it is likely that traffic to and from Queenstown will travel via SH6 and over the Shotover River Bridge, where there is a capacity concern as explained above. Relying on the assessment above, which provides a total of 102 new lots, and the trip rate generation figure of 0.25 in the AM and 0.28 in the PM with 75% occupancy of households, I estimate 19 additional trips in the AM peak and 21 additional trips in the PM peak over the Shotover River Bridge, which is one vehicle every 3-4 minutes.
- 11.7** This additional traffic volume is unlikely to be noticeable on the road network when considered in isolation from increases in traffic corresponding to other rezoning requests received through

submissions, or other forms of development (ie. SHAs). I also note that Arrowtown provides some employment, shopping, educational and recreational facilities to meet local's everyday needs, so on this basis the network-wide effects may be less. It is also flat and easy to access which will in part mitigate some of the effects on the wider network, as the uptake of alternative modes may be higher within Arrowtown itself (ie. walking and cycling).

11.8 On this basis, while additional demand may be able to be accommodated by the current capacity of the network, in my view granting the rezoning request will contribute to a negative impact on the long-term performance of the network when considered in the context of cumulative effects of development in the Wakatipu Basin.

11.9 It is noted that as there is no transport assessment available in support of this submission, I am unable to consider any mitigation that may offered to address network effects or safety concerns that may otherwise be put forward in a transport assessment report. This observation also applies to other submissions addressed later in my evidence where no transport assessment has been prepared.

11.10 Consequently, I oppose Part Lot 1 and Lot 2 DP 300390 being zoned as Low Density Residential and included in the Arrowtown Urban Growth Boundary on the basis of likely cumulative effects.

12. A FEELEY, E BORRIE & LP TRUSTEES LIMITED (2397)

12.1 Submitter 2397 has sought that Section 9 BLK VII Shotover Survey District is rezoned from Amenity Zone to Low Density Residential Zone. No transport assessment was provided with the submission.

12.2 The site is located, and accessed from, 508 Arrowtown-Lake Hayes Road. The site contains one dwelling and associated outbuildings. It has two access points, but the current access to the dwelling is midway between Butel Road and McDonnell Road. It is a narrow gravel driveway, with clear unimpeded sight distances in both directions. The secondary access is directly opposite Butel Road and currently provides access to a paddock. The site is also adjacent to McDonnell Road but has no vehicle access.

- 12.3** Arrowtown-Lake Hayes Road is the sign-posted access to Arrowtown from Queenstown on SH6. Adjacent to the site it is straight, flat and has a 100 km/hr speed limit. McDonnell Road is also straight and flat. It has residential dwellings along the east side, and has a speed limit of 50 km/hr.
- 12.4** The submission includes a Master Plan that seeks Low Density Residential Zone along the McDonnell Road edge of the site, and the ability to establish five residential units on the remainder of the site. It is not clear from the submission how these units would be accessed, whether from Arrowtown-Lake Hayes Road or McDonnell Road and whether there would be separate or joint accesses. I am therefore unable to comment on the safety of the submission in relation to the 5 units on the balance of the site, other than a general comment that access to the site could be safely provided onto McDonnell Road.
- 12.5** Council officers advise that there is the potential for up to 93 Lots if the entire site were developed as LDRZ, which is an upper limit on the development yield. I also understand that the potential yield of the Low Density Residential Zone within the Master Plan is 29 units. Combined with the five units from the remainder of site, this totals an additional 34 residential units on the site.
- 12.6** The submission is unlikely to have a significant effect on the efficiency of the local road network due to the relatively small number of additional units (34) in the Master Plan however if the entire site were developed as LDRZ the effects would be more noticeable. The level of effect will be driven by how the units are accessed, whether they are split between Arrowtown-Lake Hayes Road and McDonnell Road and/or whether access to the units are combined or separate.
- 12.7** The greater concern is the impact on the Shotover Bridge. Given the location of the site it is likely that traffic travelling to and from Queenstown is split between the Shotover Bridge and the Edith Cavell Bridge depending on the origin/destination within Queenstown or Frankton. In this assessment I have assumed a 50% split of trips between the two bridges.

12.8 Considering the 34 residential units with 75% occupancy and split 50% between the two bridges, and utilising the total cross river trip generation figures of 0.33 in the AM peak and 0.38 in the PM peak for the Shotover River Bridge, I estimate no more than 5 additional trips per peak hour on each bridge. In isolation this will not be noticeable on the road network, however, it will have a negative impact on the long-term performance of the network when considered in the context of cumulative effects of development in the Wakatipu Basin. It is further noted that if the entire site were developed as LDRZ there would be up to 13 additional trips per peak hour on each bridge.

12.9 Consequently, I oppose Section 9 BLK VII Shotover Survey District zoned in part of whole as Low Density Residential Zone on the basis of likely cumulative effects.

13. TROJAN HELMET LIMITED (2387)

13.1 Submitter 2387 has sought a bespoke resort zone or similar zoning that allows residential development and commercial golf courses including all associated and ancillary activities, rather than the notified Amenity Zone. Alternative zonings are also discussed in the submission if the bespoke resort zoning is rejected. My evidence focuses on the bespoke resort zoning.

13.2 The site is located between Lake Hayes Road – Arrowtown Road, McDonnell Road and Hogans Gully Road and comprises a number of individual lots.

13.3 The site currently contains two golf courses with associated buildings and activities, several dwellings, a visitor accommodation lodge, sculpture park and has consent for 18 new rural residential dwellings.

13.4 The zoning that is sought would allow for:

- (a) golf course and practice green, provisions for a driving range;
- (b) golf club house, with restaurant, café, and associated commercial activities;
- (c) maintenance and service facilities;

- (d) residential / visitor accommodation in areas that are nestled into the landscape;
- (e) worker accommodation; and
- (f) amenity landscaping.

- 13.5** The submission is support by a Transportation Assessment Report (TAR) prepared by Traffic Design Group from October 2015. The report concludes that, *“the traffic that would be generated by the proposal land use activities would be accommodated without adversely affecting the level of service or road safety on Arrowtown-Lake Hayes Road, McDonnell Road and Hogans Gully Road and their intersections”*.
- 13.6** The traffic assessment is based on a current trip generation of 200 – 350 vpd for the site. It is not clear from the report how this number was developed, so I am unable to comment on how appropriate it is. No actual data has been provided either.
- 13.7** The assessment anticipates 100 new residential and visitor accommodation units. A trip generation of 8 movements per unit per day has been used, for a total generation of 800 new trips. In combination with the current trip generation, the site is said to generate between 1,000 – 1,150 vehicles per day.
- 13.8** Of the 800 new trips, the TAR assumes that 520 movements will occur from the McDonnell Road access, 80 at the Hogans Gully Road access and 200 at the Arrowtown-Lake Hayes Road accesses.
- 13.9** I agree with the conclusion that trip generation is unlikely to affect the local road network at the three site access points subject to safe and appropriate intersection treatment at each access, however, my concern is with the capacity of the wider network, and particularly, the Shotover River Bridge.
- 13.10** Given the location of the access points, and that the activities of the site will generate a significant amount of tourist activity from the Queenstown Airport, I expect that the majority of the movements between the site and Queenstown will traverse the Shotover River

Bridge. For the purposes of this exercise I have allocated 85% of the traffic (510 vehicles) over the Shotover River Bridge, and 15% of the traffic (90 vehicles) over the Edith Cavell Bridge per day. This takes into account the 75% assumed occupancy of the dwellings and allows only for the additional 800 vehicle movements from the new activities.

- 13.11** Utilising the trip rate generation figure of 0.25 in the AM peak and 0.28 in the PM peak for the Shotover River Bridge, I estimate 127 additional trips in the AM peak and 142 additional trips in the PM peak. The Edith Cavell Bridge has a trip rate generation of 0.08 in the AM and 0.10 in the PM, corresponding to seven and nine additional vehicle movements in peak hour.
- 13.12** I note that these figures do not account for increased activities associated with the golf course which seem to be implied in the submission but not fully articulated. Therefore, I am unable to assess additional trip generation corresponding to this activity. I also note that provision is sought for up to 10 large events at the site, which will result in a further increase in trip generation during those events. Finally, information provided from QLDC planning staff indicates that the potential yield is 150 units, which would add an additional 50% of new trips to those discussed in the transport assessment.
- 13.13** Even with these conservative trip generation rates, the proposed activities would have a significant impact on the efficiency of the transport network and use a good proportion of the remaining capacity over the Shotover River Bridge. This would necessitate accelerating investment in adding further capacity to the network that is not yet planned.
- 13.14** The rezoning request contains seven access points into the site. Two of these access points are new, which I generally consider to be appropriate. Although I note that a couple are marginal in terms of sight visibility requirements, however, not to an extent or in an environment that generates a significant concern.
- 13.15** Consequently, I oppose a special resort zone or any zoning that would allow for the level of development that is planned in the submission.

This is because it is expected to have a significant impact on the efficiency of the network at the Shotover River Bridge that would necessitate significant investment in additional capacity that has not been planned, or addressed in the submission.

14. PATRICIA NANCEKIVELL (2171) / DENIS SHAW (2129)

- 14.1** Submitter 2171 and 2129 has sought that the land along Mooney Road remains zoned as Rural General as in the ODP. This land was notified within the Wakatipu Basin Lifestyle Precinct. No transport assessment was provided with either submission.
- 14.2** The submissions refer to Mooney Road in general, and does not refer to any specific site. Mooney Road is a narrow gravel road that provides access to a small number of rural / residential properties. Mooney Road links to Hunter Road and on to Lower Shotover Road. Lower Shotover Road links into Frankton Ladies Mile Highway which provides access to Frankton and Queenstown over the Shotover Bridge.
- 14.3** The submissions seek that the land alongside Mooney Road is retained as Rural General zoning as it has a lower allowable density than the notified Precinct.
- 14.4** From a transport perspective, the submissions focus on the safety of Mooney Road with a concern that an increase in development will lead to an increase in crashes due to its narrow width and dangerous intersection with Hunter Road. Submission 2129 states that at best Mooney Road is one and half lanes wide, and that there are many near misses with unfamiliar drivers. It states that allowing additional subdivision will immeasurably increase the possibility of road accidents. This concern also applies to the intersection of Mooney Road and Hunter Road.
- 14.5** Mooney Road approaches Hunter Road at an approximately 40-degree angle, and also approaches from a higher elevation than Hunter Road. The sight distance along Hunter Road is approximately 120m from Mooney Road. The combined factors of the gradient, elevation and restricted sight distance does not provide an optimal intersection from a safety perspective.

- 14.6** A search of the NZTA crash record database found that there were no recorded crashes on Mooney Road in the last five years, and only one crash on Hunter Road within 50 meters of the intersection with Mooney Road. The crash was classified as a severe injury crash.
- 14.7** Given the current cross section of Mooney Road it is not unreasonable to consider that the crash risk will increase with additional traffic generated by any new development. Although this risk may not result in a significant increase in the actual number of crashes as there does not appear to be a significant crash problem with the current use of Mooney Road or at the intersection with Hunter Road.
- 14.8** Submission 2129 also states that the proposed zoning would enable the subdivision of up to 100 new titles that allow for one house and one residential unit for each site, a total of 200 units. The submission states the proposed zoning would not allow for the assessment of cumulative effects of the individual development of these sites. From a transport perspective this has both a safety and network efficiency implication.
- 14.9** It is likely that the effects of this level of development would have an impact on the local network and require improvements to Mooney Road, and the intersection at Hunter Road. The development would likely occur incrementally as the lots along Mooney Road are currently owned by approximately 14 separate individuals or entities. It would be difficult for the Council to assess through the resource consent process when improvements to the road are required, and to justify who should contribute to the cost. A better approach may be for Council to complete necessary roading infrastructure upgrades before rezoning, and seek to recoup costs as permissible under the Local Government Act through Development Contributions as subdivisions occur. Alternatively, the land not be zoned Wakatipu Basin Lifestyle Precinct, as per the submission request.
- 14.10** I also have a concern that increased development would negatively contribute to the congestion at the Shotover River Bridge with traffic travelling to and from Frankton and Queenstown.

14.11 Assuming 200 additional units as a worst case, and applying the 75% occupancy rate and the 0.28 PM peak hour trip rate, there would be up to 42 additional vehicle movements over the Shotover Bridge in the peak hour. This may not have a significant effect in its own right, however, when considered alongside other development and background traffic growth (cumulatively), it will have a negative impact on the long-term performance of the network and contribute to the congestion at the Shotover River Bridge.

14.12 Consequently, I do not oppose the request to zone the land alongside Mooney Road as Rural General on transportation grounds.

15. MIDDLETON FAMILY TRUST (2332)

15.1 Submitter 2332 has sought extensions of the Wakatipu Basin Lifestyle Precinct and Tuckers Beach Residential Precinct to apply to Sections 21, 24, 40, 41, 44, 61 Blk XXI Shotover SD and Section 93 Blk II Shotover SD. This land was notified as Wakatipu Rural Amenity Zone. No transport assessment was provided with the submission.

15.2 The land is generally located between Lake Johnson and the Shotover River, in the Tucker Beach area. Primary access to the area is via Tucker Beach Road which links into Frankton-Ladies Mile Highway just west of the Shotover River Bridge. The submission notes that both the Shotover River Bridge and Edith Cavell Bridge are likely to be critical infrastructural constraints in the near future, and that Tuckers Beach Landscape Unit is the only unit within the Wakatipu Basin which does not rely upon the capacity of the Shotover River Bridge. Further, it is noted that the intersection of Tuckers Beach Road and Frankton-Ladies Mile Highway is proposed to be grade separated by the NZTA providing even better access to the wider transport network.

15.3 Of relevance to transport effects, the submission seeks to increase the area zoned as Precinct and Tuckers Beach Residential Precinct, while also reducing the minimum lot size within the Precinct. The effect of this submission, if accepted, will be an increase in trips generated from the site, along Tuckers Beach Road to the intersection of Frankton-Ladies Mile Highway.

- 15.4** It is not clear from the submission what the total additional number of lots would be, and no yield assessment has been provided from Council. I will therefore comment only in general terms on the submission.
- 15.5** I agree with the submission that this a preferable location for additional development in the Wakatipu Basin over other locations to the east of the Shotover River, as it is unlikely to generate significant additional traffic over the Shotover River Bridge. Furthermore, I understand that the grade separation of Tuckers Beach Road and Frankton-Ladies Mile Highway is expected to be completed within the next 12 months and will provide a safer and more efficient connection between the two roads. I do note however, that this development will contribute to the congestion shown in the LOS plots in **Attachment A** between Tuckers Beach Road and the recently constructed SH6 Hawthorne Drive roundabout. It is noted that congestion along this section of SH6 may be addressed through the imminent intersection grade separation project or a subsequent four-laning of SH6, and it is much cheaper to provide additional capacity to this section of SH6 than it is over the Shotover River.
- 15.6** Consequently, I do not oppose Sections 21, 24, 40, 41, 44, 61 Blk XXI Shotover SD and Section 93 Blk II Shotover SD being zoned as Wakatipu Basin Lifestyle Precinct and Tuckers Beach Residential Precinct on transportation grounds.

16. SUBMISSIONS RELATING TO LAND ADJOINING LADIES MILE

- 16.1** Six submissions (reference numbers set out in the table below) have been received that apply to approved SHAs in the Ladies Mile area. These submissions seek a zoning that allows for a greater or lesser density than is provided for by resource consents approved for the corresponding SHAs. A summary of the submissions is set out in the table below with changes in household yield advised by Council planning staff (a map showing the location of the submissions and Special Housing Areas is contained in page three of Attachment C):

Submitter	SHA Number	Zone sought	Max yield under zone sought	Approved SHA yield	Change in yield
239	SH160140	RLZ	8	244	-236
404	SH160140	LDR/MDR/HDR/LLR	446	244	Various
850	SH160140	LDR	606	88	518
655	SH150001	MDR	180	136	44
528	SH160139	SCSZ/LDR/LLR/RLZ, RRZ	106	101	Various
842	SH160140	MDR	31	21	10

16.2 The following table contains a summary and discussion of each submission and a recommendation to oppose or not oppose the submission based on transportation grounds.

Submitter	Summary of submission	Discussion	Oppose/Not Oppose
239	Seeks that Lot 500 DP 470412 is partially rezoned to Rural Lifestyle, and that the 2 ha average rule be removed, with the requirement for new lots in the Rural Lifestyle zone being limited to a 1 ha minimum allotment size.	Council's yield assessment of the requested zone change would allow for an additional 8 Lots on the site. This is a significant decrease from what is permitted through SH160140 which allows for up to 244 additional Lots. This zone change would therefore reduce demands on the transport network including the SH6 Shotover Bridge, therefore I do not oppose this submission on transportation grounds.	Not oppose
404	Seeks that Lot 500 DP 470412 is rezoned to an urban zone (LDR/MDR/HDR/LLR) to provide for the construction and use of a retirement village as a controlled or restricted discretionary. To also include the lot in the urban boundary.	QLDC planning staff have provided an assessment of the potential yield of this site for different zoning types. The yield ranges from 27 – 445 (the highest being MDR with 250m ² lots). SH160140 has approved 244 residential Lots, along with a hospital, 72 bed aged care and dementia care facility, clubhouse, bowling green and pavilion with ancillary community and	Oppose MDR and HDR Not oppose LLR/ LDR

		<p>recreation activities (medical centre, childcare facility and gym/pool), and ancillary commercial activities (including retail, café and boatshed café/restaurant). The MDR zone would allow an additional development of 202 Lots over what is approved in the Special Housing Area (and HDR would allow an even greater increase). This would result in up to an extra 58 vehicles movements over the Shotover Bridge in the PM peak. This will exacerbate congestion at this location bringing forward the need to duplicate or four-lane the bridge. I therefore oppose MDR and HDR zoning on transportation grounds. LDR will only increase the yield of the site by 3 Lots, and LLR would result in a significant decrease in the number of Lots. Therefore, these zonings are not opposed due to the relatively neutral or positive impact in reducing trip generation in the area.</p>	
850	<p>Seeks that the area comprising Sections 109, 110, 66 & 129 Blk III Shotover SD, Lot 2 DP 20797, Lot 2 DP 475594 is zoned as Low Density Residential and included within the Urban Growth Boundary.</p> <p>The area was notified as Rural Zone.</p>	<p>Council's assessment of the potential yield of the site as Low Density Residential is 606 additional Lots. Approximately half of the area referred to in the submission is included in the approved SH160140, which allows for 88 Lots. The requested zoning would therefore result in an additional 518 Lots beyond the SHA and notified Rural zoning. This would result in up to an extra 150 vehicle movements over the Shotover Bridge in the PM peak. This will exacerbate congestion at this location bringing forward the need to duplicate or four lane the</p>	Oppose

		bridge. I therefore oppose LDR zoning on transportation grounds.	
655	Seeks that the area comprising of Lot 3 DP 392823, Lot 4 DP 447906, Lot 1 DP26719, Lot 1 DP 21087, Lot 3 DP 337268 is zoned Medium Density Residential and included within the Urban Growth Boundary. The area has been notified as a mixture of Low Density Residential, Rural Lifestyle and Rural General.	Council's assessment of the potential yield of the site as Medium Density Residential is 180 additional Lots. The approved SH150001 provides for 136 Lots plus two allotments that contain existing residential units. The requested zoning would therefore increase the yield of the area by approximately 44 lots, and would likely result in up to 13 additional movements over the Shotover Bridge in the peak periods. This additional traffic volume is unlikely to be noticeable on the transport network when considered in isolation from increases in traffic corresponding to other rezoning requests received through submissions. On this basis I believe that this additional demand can be accommodated within the current capacity of the network, however, it will negatively impact on the long-term performance of the network when considered in the context of cumulative effects of development in the Wakatipu Basin. I oppose the MDR rezoning sought on the basis of cumulative traffic effects.	Oppose
528	Seeks that the site (Lot number not defined in the submission) is rezoned from rural to residential or a special zone to provide for a greater level of development.	Council has provided an assessment of the potential yield of the site for different zoning types. The yield ranges from 2 – 106 additional Lots depending on the zone, the highest being LDR. The approved SH160139 allows for 101 lots. It is only the LDR that allows for a higher level of development than the SHA. Although this is a small increase of 5 additional	Oppose LDR. Not oppose LLR, RL, RR, Shotover Country Special Zone.

		<p>lots, I oppose a change in zoning to LDR on the basis of cumulative transportation effects.</p> <p>However, LLR, RL, RR, and the Shotover Country Special Zone would allow less development than the SHA and can therefore be supported due to the positive effect on the transport network.</p>	
842	<p>Seeks that Lot 403 DP379403 is zoned as Medium Density Residential, and to include the Lot in the Urban Growth Boundary. The Lot was notified as Rural Zone.</p>	<p>Council's assessment of the potential yield of the site as Medium Density Residential is 31 additional Lots. The approved SH160140 allows for a 21 Lot subdivision. MDR would therefore allow an additional 10 lots on the site. This additional traffic volume is unlikely to be noticeable on the road network when considered in isolation from increases in traffic corresponding to other rezoning requests received through submissions. On this basis I believe that this additional demand can be accommodated within the current capacity of the network, however, it will negatively impact on the long-term performance of the network when considered in the context of cumulative effects of development in the Wakatipu Basin. I oppose the MDR rezoning sought on the basis of cumulative traffic effects.</p>	Oppose

17. BILL & JAN WALKER FAMILY TRUST (532)

- 17.1** Submitter 532 has sought that Lot 4 DP 22156 is zoned as Rural Lifestyle. This land was notified as Rural Zone.
- 17.2** The site is located at 516 Frankton-Ladies Mile Highway, Wakatipu Basin and is described as LOT 4 DP 22156. The Lot also has a

frontage on Howards Drive but with no current access. The Lot contains a primary dwelling, and one secondary dwelling. The remainder of the lot is used for agricultural purposes.

- 17.3** The submission seeks a range of amendments (of relevance to transport effects) to: allow subdivision, more than one residential unit per building platform, and a limit of 2 residential units per hectare. It opposes Chapter 27, and seeks to retain Chapter 15 of the ODP, and seeks changes to boundary adjustment rules to be a controlled activity. It also seeks to reduce the average lot size from 2 hectares to 1 hectare allowing for subdivision.
- 17.4** The submission does not include any detail of the type of development that might be sought, or how it may be accessed. I am therefore unable to comment on the safety of access arrangements for the site, other than a safe and appropriate access should reasonably be achieved from Howards Drive and this would be addressed at Resource Consent stage.
- 17.5** The Council assessment suggests that the possible yield from the Rural Lifestyle Zone would be between 7 lots (based on a 2ha average allotment size) and 14 lots (based on a 1ha average allotment size). Given the location of the site, it is likely that any residential development on the Lot would primarily accommodate people that work in Frankton or Queenstown CBD, and would therefore increase traffic volumes along SH6, and exacerbate congestion on the Shotover River Bridge.
- 17.6** With 7 additional lots, additional 2 vehicle movements over the Shotover River Bridge would be generated in peak periods. This additional traffic volume is unlikely to be noticeable on the road network when considered in isolation from increases in traffic associated with other rezoning requests received through submissions. On this basis I believe that this additional demand can be accommodated within the current capacity of the network, however, it will negatively impact on the long-term performance of the network when considered in the context of cumulative effects of development in the Wakatipu Basin.

17.7 Consequently, I oppose Lot 4 DP 22156 is zoned as Rural Lifestyle on the basis of cumulative transportation effects.

18. G W STALKER FAMILY TRUST, MIKE HENRY, MARK TYLDEN, WAYNE FRENCH, DAVE FINLIN, SAM STRAIN (535) & ALEXANDER REID (277)

18.1 Submitter 535 has sought that the area generally located on the northern edge of Frankton-Ladies Mile Highway, between Lower Shotover Road and the edge of Lake Hayes is zoned as Rural Lifestyle. This land was notified as Rural Zone.

18.2 Submitter 277 seeks that the same area has a mixture of Rural Residential and Rural Lifestyle, but does not define how this mix of zoning would apply to the Lots.

18.3 The submissions apply to at least 50 Lots that are not named in the submission. The Lots are located on the northern edge of Frankton-Ladies Mile Highway, between Lower Shotover Road and the edge of Lake Hayes. The Lots primarily contain rural activities with associated residential dwellings. Some of the Lots are accessed from Frankton-Ladies Mile Highway, and the remainder from local roads.

18.4 Submission 535 seeks amendments to Chapter 22 Rural Residential and Rural Lifestyle to reduce the 2ha minimum average down to 1ha minimum average, and to allow two residential units within one residential building platform. These amendments essentially improve the ability to subdivide and to increase the density of dwellings on each lot.

18.5 The Council planner's assessment suggests that the possible yield from the Rural Lifestyle Zone would be 31 additional Lots (based on a 2ha average lot size) and 62 additional lots (based on a 1ha average lot size), and the potential yield as Rural Residential is 156 additional Lots.³

18.6 Given the location of the site, it is likely that any residential development would primarily accommodate people that work and visit

3 The yield calculations exclude the Threepwood subdivision that is located in the Amenity Zone.

Frankton or Queenstown CBD, and would therefore increase traffic volumes and exacerbate congestion on SH6, most notably at the Shotover River Bridge.

- 18.7** A Rural Lifestyle zone would contribute up to 9 additional vehicle movements over the Shotover River Bridge in the PM peak. The Rural Residential zone would contribute up to 44 additional movements in the PM peak.
- 18.8** I oppose any zoning that would allow for an increase in development in this area. This is because it is expected to have a significant impact on the efficiency of the network at the Shotover River Bridge that would necessitate significant investment in additional capacity that has not been planned.
- 18.9** Consequently, I oppose this area zoned as Rural Lifestyle or Rural Residential based on transportation grounds. I, do however note that the transportation effects due to Rural Lifestyle or Rural Residential zoning would be less significant than those under a higher density zoning such as may be achieved through a SHA application.

19. D. BOYD (838)

- 19.1** Submitter 838 has sought that the area of land along the southern side of SH6 between Old School Road and Stalker Road is zoned Large Lot Residential and included in the Urban Growth Boundary. This land was notified as Rural.
- 19.2** The site is located at 53 Max's Way, Queenstown. The site is in close proximity to the Stalker Road and Frankton-Ladies Mile Highway roundabout which provides access to the wider network via SH6.
- 19.3** The Council assessment suggests that the possible yield from Large Lot Residential at 2000m² is 77 Lots, and the yield from Large Lot Residential at 4000m² is 38 Lots.
- 19.4** With 77 additional Lots, the site would generate an additional 22 vehicle movements, and with 38 additional Lots the site would generate an additional 11 vehicle movements over the Shotover River Bridge in

the peak periods. This additional traffic volume is unlikely to be noticeable on the road network when considered in isolation from increases in traffic corresponding to other rezoning requests received through submissions. On this basis I believe that this additional demand can be accommodated within the current capacity of the network, however, it will negatively impact on the long-term performance of the network when considered in the context of cumulative effects of development in the Wakatipu Basin.

- 19.5** Consequently, I oppose the area of land along the southern side of SH6 between Old School Road and Stalker Road zoned Large Lot Residential on the basis of cumulative transportation effects.

20. MARTIN MCDONALD AND SONYA ANDERSON (451)

- 20.1** Submitter 451 has sought that Lot 2 DP 457573 is zoned as Rural Lifestyle as notified, and that Lot 1-3 DP 4771202 which has been notified as Low Density Residential is zoned as Rural Lifestyle.
- 20.2** The submitter owns Lot 2 DP 457573, located at 51 Walnut Lane, Queenstown. However, the submission primarily relates to Lot 1-3 DP 4771202, located at 45 A-C Erksine Street.
- 20.3** The proposed zoning from the submission would result in a lower allowable density on Lot 1-3 DP 4771202. From a transportation perspective, this zoning of the land would generate fewer trip movements and therefore have less of an impact on the efficiency and safety of the network.
- 20.4** Consequently, I do not oppose Lot 1-3 DP 4771202 zoned as Rural Lifestyle on transportation grounds.

21. JANE AND RICHARD BAMFORD (492)

- 21.1** Submitter 492 has sought that Lots 12-17 DP 445230 retains the notified zoning unless SH150001 for the Bridesdale Farm is approved, in which case the Lot should be an alternative rural living or low density urban zoning. I understand that this may correspond to Rural Residential, Rural Lifestyle, Large Lot Residential or Low Density

Residential zoning. This land was notified as Low Density Residential, and Rural General.

- 21.2** The site is located at the end of Judge and Jury Drive, Lake Hayes Estate, Queenstown.
- 21.3** The submission is conditional on the outcome of the Bridesdale Farm Special Housing Area SH150001. I understand that the SHA has been approved, therefore the submission seeks that the land is zoned to be consistent with the Bridesdale Farm.
- 21.4** The Council planner's assessment suggests that the possible yield from the Rural Lifestyle would be 1 lot, Rural Residential would be 2 lots, Large Lot Residential A would be an additional 9 lots and the yield of Low Density Residential would be 47 additional lots.
- 21.5** With 47 or 9 additional Lots, the site would generate an additional 13 or 3 (respectively) vehicle movements over the Shotover River Bridge in the peak periods. This additional traffic volume is unlikely to be noticeable on the road network when considered in isolation from increases in traffic corresponding to other rezoning requests received through submissions. On this basis I believe that this additional demand can be accommodated within the current capacity of the network, however, it will negatively impact on the long-term performance of the network when considered in the context of cumulative effects of development in the Wakatipu Basin.
- 21.6** However, 1 or 2 additional Lots under Rural Lifestyle or Rural Residential zoning is unlikely to have any substantive effect on the efficiency or safety of the network.
- 21.7** Consequently, I oppose Lot 17 DP 445230 zoned as Low Density Residential or Large Lot Residential (or any zoning at higher density such as Medium Density Residential), however, I do not oppose Lot 17 DP 445230 zoned Rural Lifestyle or Rural Residential.

22. CONCLUSIONS

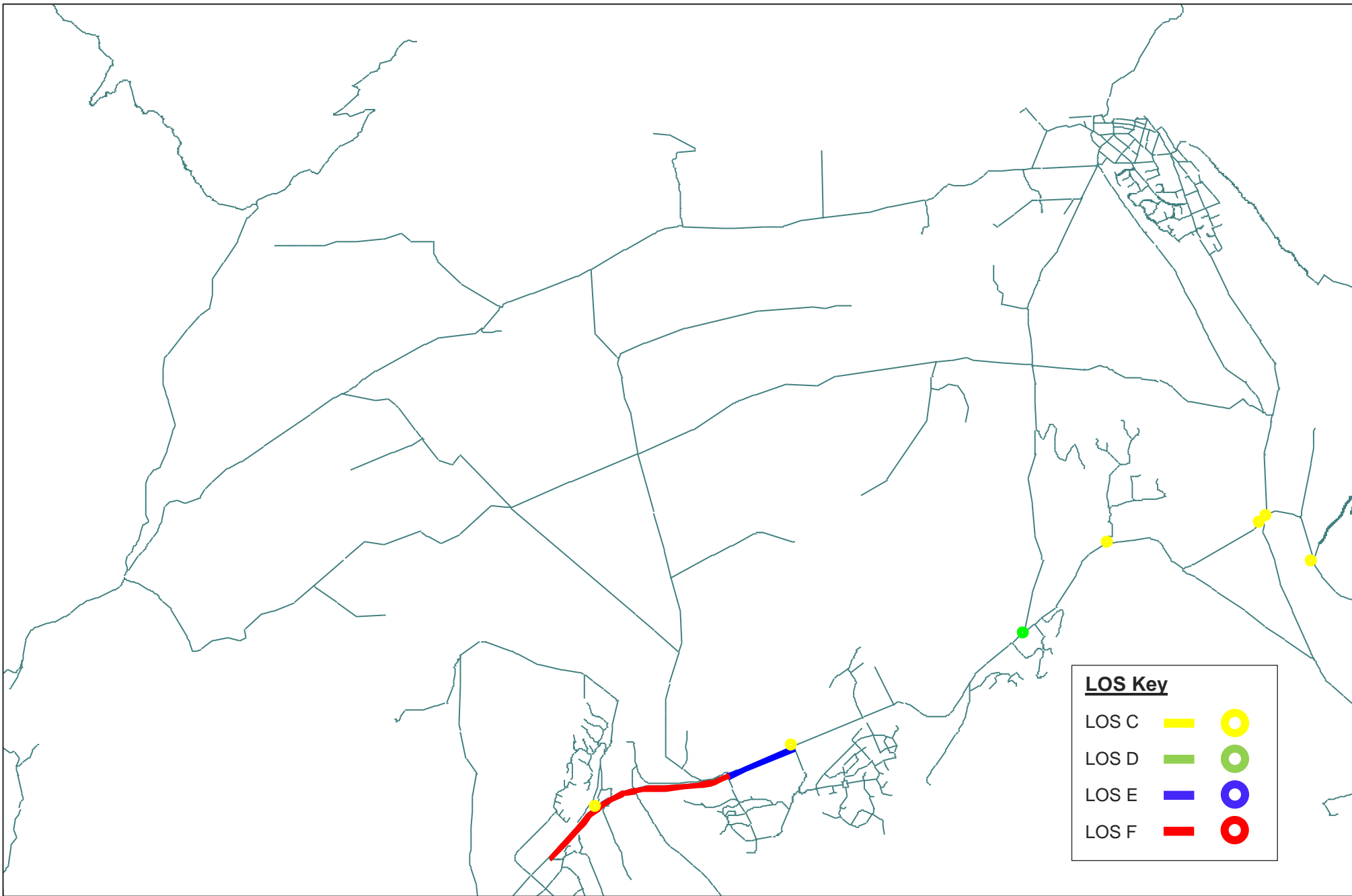
- 22.1** Many of the submissions have not provided any, or adequate, information addressing the traffic and transportation effects associated with the rezoning requested. None of the submissions I have considered address transport effects across the wider network or consider cumulative effects of additional development.
- 22.2** I consider that the approval of any of the submissions which propose to increase density within the Wakatipu Basin will result in transportation effects at key capacity constraints for the transport network and exacerbate congestion issues. The approval of submissions that propose to reduce density will lessen those same effects.
- 22.3** While many of the submissions relate to relatively small increases in activity which considered in isolation would have no noticeable effect on the performance of the transport network, there is a risk of cumulative effects if a number of these submissions are approved together. Cumulative effects are difficult to properly consider and address through the Resource Consent process, and in my view should be considered at the District Plan Change stage.
- 22.4** In light of the above, without appropriate mitigation being sought to address effects associated with an increase in household numbers / density along the SH6 corridor in the vicinity of the Shotover River Bridge, Edith Cavell Bridge and Arrow Junction, I oppose all submissions which propose to increase density.



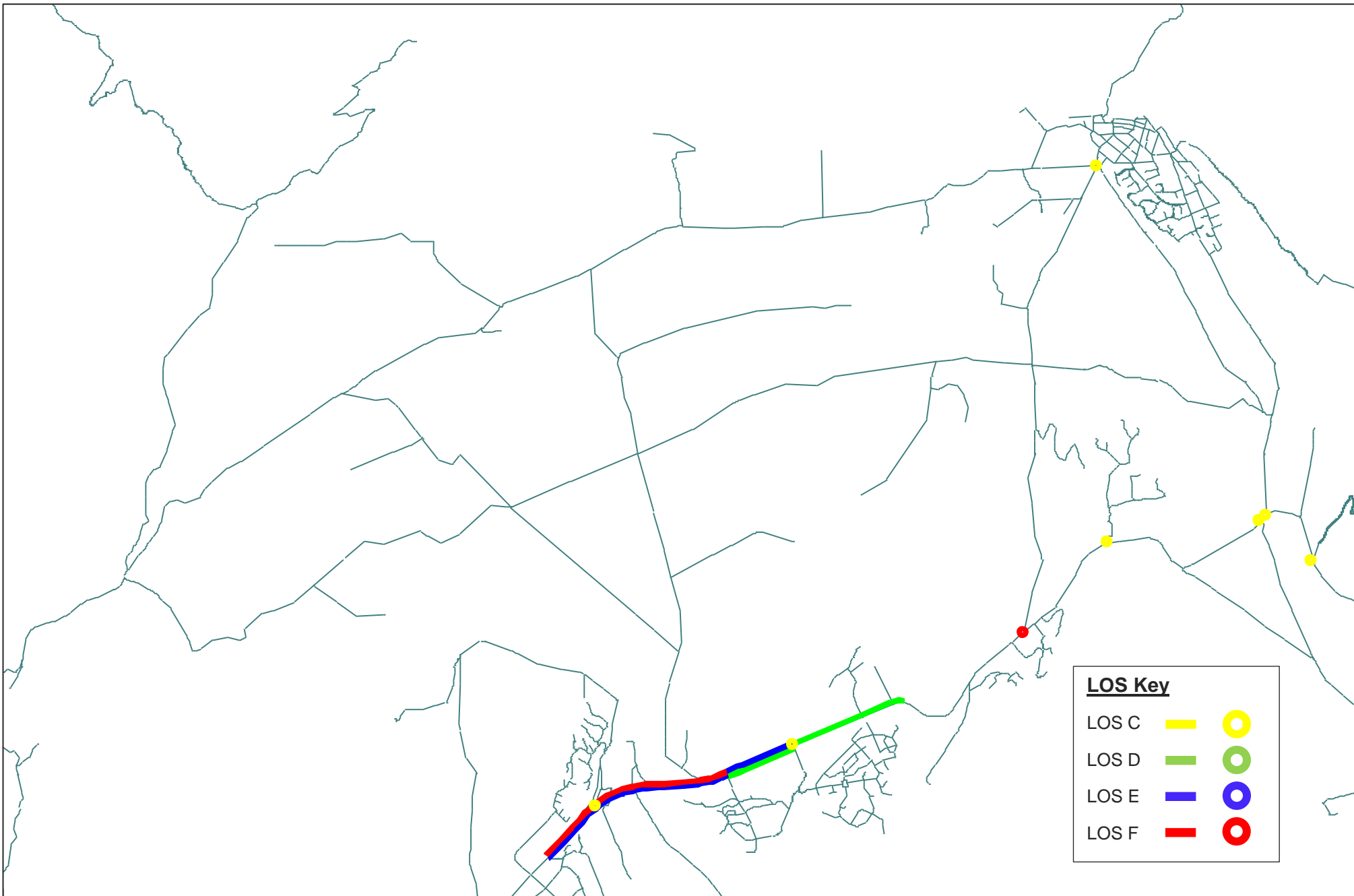
David John Robert Smith
28 May 2018

ATTACHMENT A

Peak period Level of service plots for the Wakatipu Basin;



2045 Baseline Level of Service Plot – AM Peak Hour 0800-0900



2045 Baseline Level of Service Plot – PM Peak Hour 1700-1800

ATTACHMENT B

Shotover River Bridges Capacity Analysis technical note; and

Shotover River Bridges Capacity Analysis

Prepared for: Craig Barr, QLDC
Job Number: QLDC-J019
Revision: Final
Issue Date: 14 May 2018
Prepared by: Jared White, Senior Transportation Engineer
Reviewed by: Dave Smith, Associate Transportation Planner

1. Introduction

There is the potential for more residential and development to become available along the SH6 Ladies Mile corridor to the east of the Shotover River bridge. Abley have undertaken an assessment of the effects of additional residential development on the SH6 Shotover River Bridge and Edith Cavell Bridge on Arthurs Point Road. This technical note presents the methodology and outcomes of a capacity analysis focusing on when the existing structure will reach its theoretical capacity and how this would be affected by any additional development along the Ladies Mile corridor. A framework is also included to demonstrate how this analysis could be used to assess the effects of rezoning requests received through submissions to the Proposed District Plan Stage 2, future Plan Change requests or Special Housing Areas in the vicinity.

2. Calculating the bridge capacity

The capacity of the existing SH6 Shotover Bridge has been calculated using the procedure specified in the NZ Transport Agency Economic Evaluation Manual (NZ Transport Agency 2016) for two-lane rural roads. Based on an approximate 65/35 directional distribution of traffic during peak hours, a total roadway width of eight metres, and 4% and 7% heavy vehicles in morning and evening peak hours respectively, the capacity is calculated as 1590 vehicles per lane per hour.

This figure has been validated using the methodology in Austroads Guide to Traffic Management Part 3 (Austroads 2017) for uninterrupted flow facilities which equates to 1560 vehicles per lane per hour in the evening peak hour. For the purposes of this assessment a peak hour capacity of 1590 vehicles per lane (from the NZ Transport Agency methodology) has been applied.

The Edith Cavell Bridge is a one lane two-way bridge on the local road network (not a State Highway). A specific capacity analysis has not been undertaken for the Edith Cavell Bridge as there is a project included in the Otago Southland Regional Land Transport Plans 2015-2021 (item 72 in the 2018 RLTP variation) for additional work associated with an additional crossing adjacent to the Edith Cavell Bridge for all transport modes. It is expected that an additional crossing to provide more capacity would likely be delivered in the next ten years.

3. Capacity analysis methodology

The capacity analysis considers traffic generated under a selection of future growth scenarios to determine the year at which the Shotover River bridge will reach its theoretical capacity. The scenarios consider the expected future growth under current zoning provisions as well as exploring the impact of any additional residential growth to the east of the bridge over and above the current QLDC growth projections.

The following assumptions have been made in the technical analysis:

- the current traffic volumes on the bridge have been estimated based on NZ Transport Agency average weekday traffic counts from March 2016 at site 00600991 (SH6 to east of Lower Shotover Rd) and adjusted up based on the QLDC Tracks Transportation Model flows from Stalker Road and Lower Shotover Road.
- Background growth in traffic volumes out to 2045 have been assumed based on modelled growth in traffic from the QLDC Tracks Transportation Model and are informed by QLDC's Queenstown Lakes District Growth Projections 2018-2058 published by Rationale in 2016 and the zoning densities for the Wakatipu Basin Rural Amenity Zone and Wakatipu Basin Lifestyle Precinct under the Proposed District Plan Stage 2.
- Additional household growth over the Shotover River has been inferred from the 2045 baseline model. The trips over the bridges have been isolated for trips to/from the Wakatipu Basin the origin zone for westbound trips and to the destination zone for eastbound trips. The number of trips has been divided by the number of households to determine a trip rate per household for trips over the Shotover River bridges. In the critical evening peak hour the trip rate for the Edith Cavell Bridge in Arthurs Point is 0.10 eastbound trips per household while the trip rate for SH6 Shotover River Bridge is 0.28 eastbound trips per household.
- Households in the Ladies Mile SHAs are unlikely to use the Edith Cavell bridge so the trip rate for both has been combined to 0.38 eastbound trips per household on the Shotover Bridge in the evening peak hour. Assuming a 75% occupancy rate as adopted in the baseline modelling the number of households have been multiplied by 0.75 (for the occupancy) and 0.38 (for the trip rate across the bridges) to determine the total increase in trips on the Shotover River Bridges for that particular scenario and added to the baseline values.

4. Findings

The calculated capacity of the Shotover River bridge is 1590 vehicles per lane per hour and currently the highest hourly demand is in the eastbound direction during the evening peak hour (1181 vehicles). Based on current growth forecasts which are consistent with QLDC's Queenstown Lakes District Growth Projections 2018-2058 published in 2016, the bridge will reach capacity when operating during the evening peak in 2035 which will extend out to 2043 if 10% of vehicle drivers shift to public transport or other alternative modes. These results are graphically depicted in Attachment A.

Additional growth in residential development to the east of the Shotover River bridge brings forward the time at which the bridge reaches capacity. If an additional say 1000 dwellings were developed by 2025 the bridge will reach capacity at 2023 (or 2027 if a 10% shift to alternative modes is achieved). A further scenario was assessed with 2000 dwellings developed by 2025 and it was concluded that the bridge would reach capacity well before the additional development was completed, irrespective of any additional uptake of alternative modes. These results are graphically depicted in Attachment B.

The year at which the evening peak hour flows exceed capacity are summarised in **Table 4.1**.

Table 4.1 Additional development effects on Shotover Bridge Capacity

Scenario	Current Mode Share	+ 10% Uptake of PT
Baseline forecast growth	2035	2043
+ 1000 Households	2023	2027
+ 2000 Households	2021	2022

5. Effects of Zoning Changes

The calculations described in Section 3 can be used to determine the effects of increased residential density arising from rezoning requests received through Submissions on the Proposed District Plan Stage 2.

The Edith Cavell Bridge is not considered to be as critical as the SH6 Shotover Bridge as there is a project to duplicate the bridge included in the Otago Southland Regional Land Transport Plans 2015-2021 scheduled to be delivered in the next ten years.

The SH6 Shotover Bridge and approached along State Highway 6 is the critical piece of infrastructure due to capacity issues and traffic growth. There is no commitment for future planned works from the NZ Transport Agency (the relevant Road Controlling Authority) to provide additional capacity to the road network at this location.

The data in **Table 5.1** can be used to determine the increased traffic levels on the bridges as a result of any additional housing development such as those sought through rezoning requests included in Submissions on the Proposed District Plan Stage 2. The effects in the peak hours are assessed in the tidal flow direction which is westbound in the morning and eastbound in the evening.

Table 5.1 Trip Rate for additional traffic demand on Shotover River Bridges from housing in the Wakatipu Basin

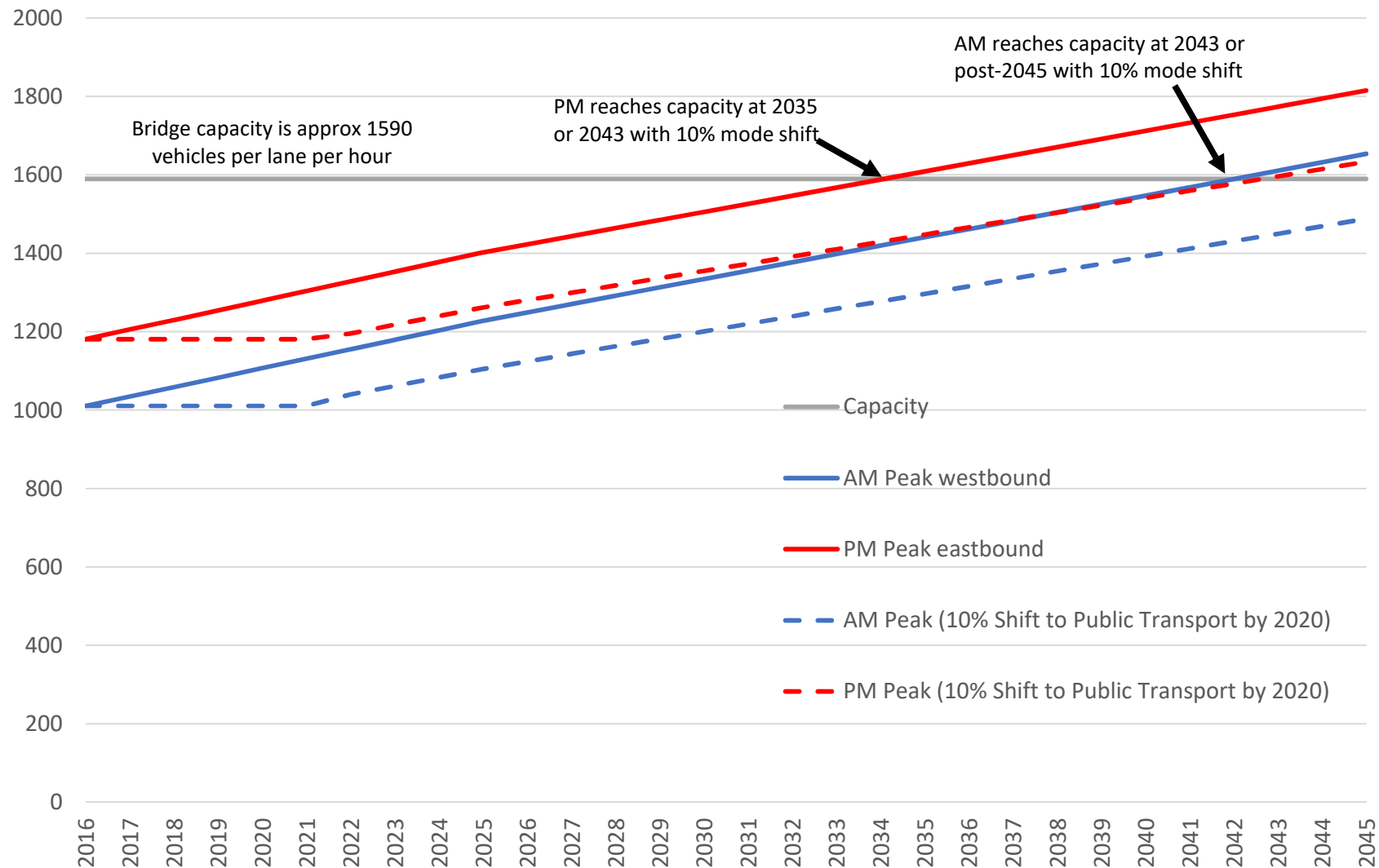
Bridge	AM trips per HHs (westbound)	PM trips per HHs (eastbound)
Edith Cavell Bridge	0.08	0.10
SH6 Shotover Bridge	0.25	0.28
Both	0.33	0.38

Note: Apply the typical occupied household rate for the area of interest

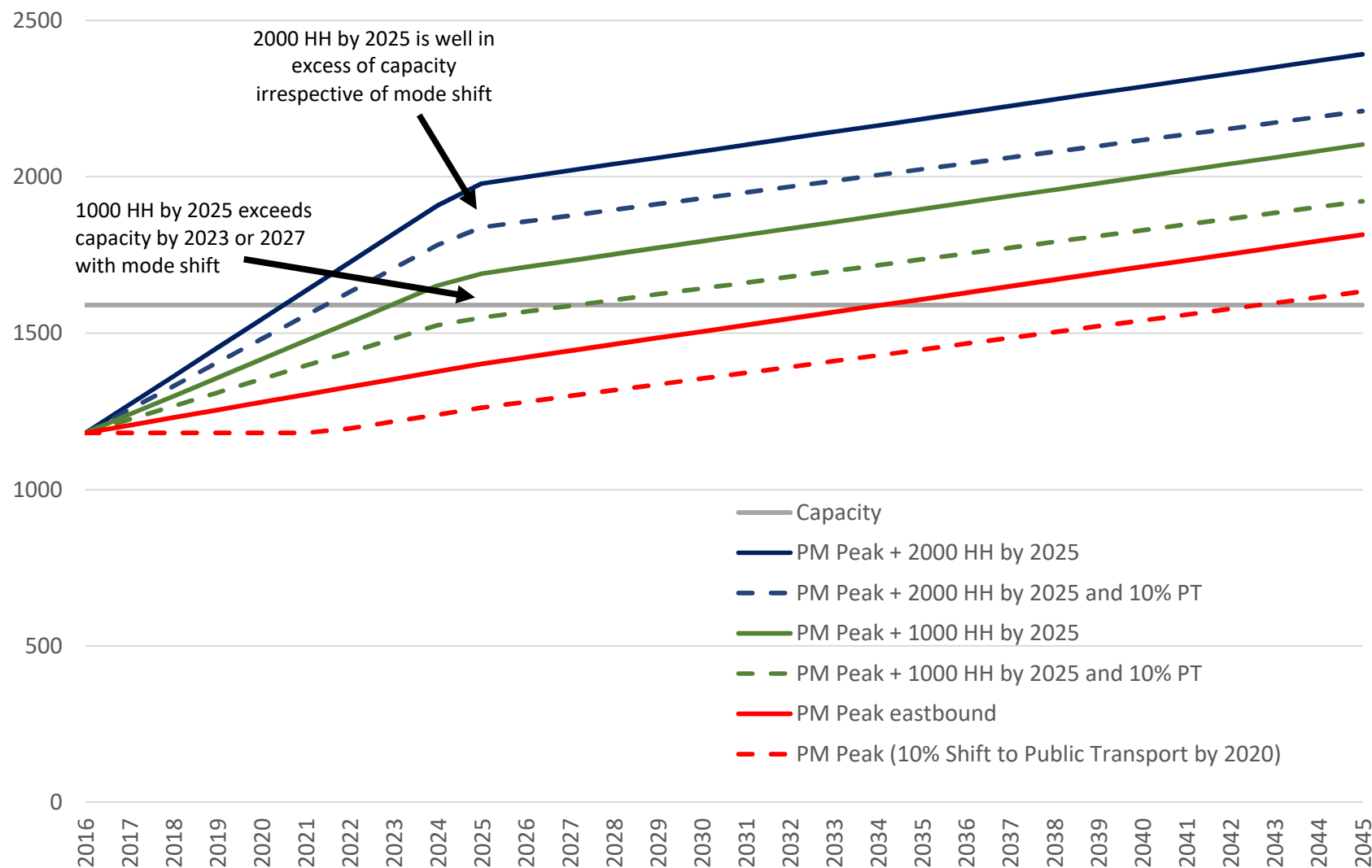
The number of households proposed over the permitted level can be multiplied by the trip rates in **Table 5.1** to enable an assessment of the effects on the bridges as a result. For an increase of 500 households for example (assuming 75% occupied dwellings) there would be 105 and 38 eastbound trips in the evening peak hour on the SH6 Shotover River Bridge and the Edith Cavell Bridge respectively.

However, it is worth noting that development adjacent to the SH6 corridor can be expected to impact primarily on the SH6 Shotover Bridge with approximately 0.33 westbound trips in the morning peak hour and 0.38 eastbound trips in the evening peak hour and have little or no noticeable effect on traffic volumes on the Edith Cavell Bridge. Conversely, development adjacent to the Arthurs Point Road and western end of the Malaghans Road corridor can be expected to impact primarily on the Edith Cavell Bridge with approximately 0.33 westbound trips in the morning peak hour and 0.28 eastbound trips in the evening peak hour and have little or no noticeable effect on traffic volumes on the SH6 Shotover Bridge.

Attachment A: Shotover River Bridge capacity analysis



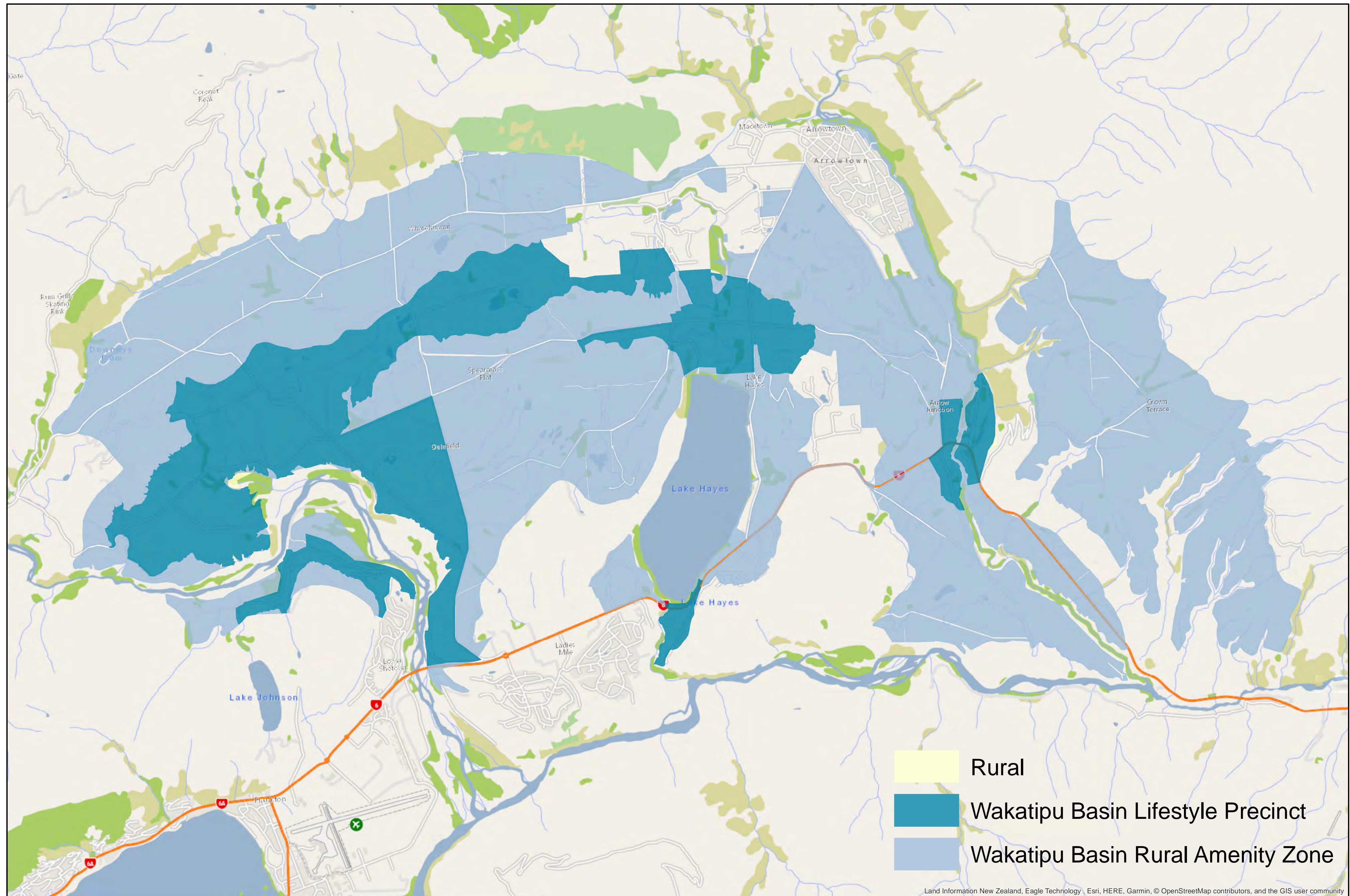
Attachment B: Capacity analysis with additional development



ATTACHMENT C

Plots of geographic extents of zones corresponding to the PDP and submissions.

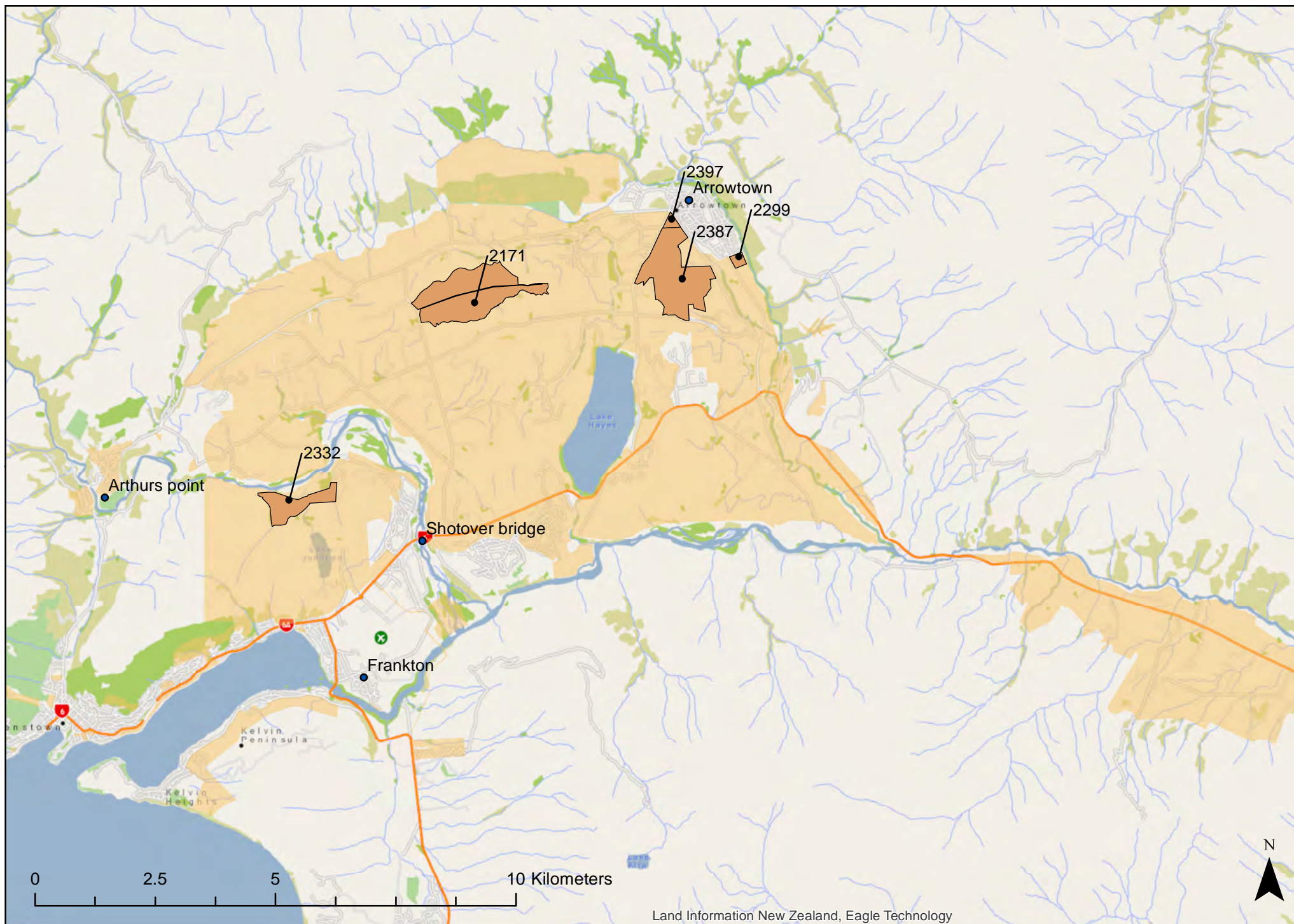
Attachment C - Notified PDP Zoning (page 1)



0 2.5 5 10 Kilometers



Attachment C - Location of Wakatipu Basin Submissions (Page 2)



Attachment C - Location of Ladies Mile Submissions (page 3)

