

Before Queenstown Lakes District Council

In the matter of The Resource Management Act 1991

And The Queenstown Lakes District proposed District Plan –
Hearing Topic 13 – Queenstown Annotations and Rezoning
Requests (Rural Group 2)

STATEMENT OF EVIDENCE OF ANDY CARR FOR

Gibbston Valley Station Limited (#827)

Dated 12 June 2017

Qualifications and Experience

- 1 My full name is Andrew (Andy) David Carr.
- 2 I am a Chartered Professional Engineer and an International Professional Engineer (New Zealand section of the register). I hold a Master's degree in Transport Engineering and Operations and also a Master's degree in Business Administration.
- 3 I am a member of the national committee of the Resource Management Law Association and a past Chair of the Canterbury branch of the organisation. I am also a Member of the Institution of Professional Engineers New Zealand, and an Associate Member of the New Zealand Planning Institute.
- 4 I have more than 27 year's experience in traffic engineering, over which time I have been responsible for investigating and evaluating the traffic and transportation impacts of a wide range of land use developments, both in New Zealand and the United Kingdom.
- 5 I am presently a director of Carriageway Consulting Ltd, a specialist traffic engineering and transport planning consultancy which I founded in early 2014. My role primarily involves undertaking and reviewing traffic analyses for both resource consent applications and proposed plan changes for a variety of different development types, for both local authorities and private organisations. I am also a Hearings Commissioner and have acted in that role for Greater Wellington Regional Council, Ashburton District Council, Waimakariri District Council and Christchurch City Council.
- 6 Prior to forming Carriageway Consulting Ltd I was employed by traffic engineering consultancies where I had senior roles in developing the business, undertaking technical work and supervising project teams primarily within the South Island.
- 7 I have been involved in a number of proposals which have assessed the transportation-related outcomes of rezoning land, either through undertaking the supporting technical transportation work, or writing and presenting evidence to the relevant hearings panel, and in most cases, both. Within the Queenstown Lakes district, these have included District Plan Changes 4 (North Three Parks), 18 (Mount Cardrona), 25 (Kingston), 39 (Arrowtown South), 41 (Shotover Country), 45 (Northlake), Queenstown Plan Change 43 (Frankton Mixed Use Zone) and 46 (Ballantyne Road Industrial and Residential Extension). I have also been involved in plan change requests for a wide variety of activities elsewhere in the South Island.
- 8 I have carried out transportation-related commissions for a variety of new developments in the Queenstown area for more than 12 years.

- 9 As a result of my experience, I consider that I am fully familiar with the particular traffic-related issues associated with the rezoning of areas of this nature.
- 10 I have read the Code of Conduct for Expert Witnesses in the Environment Court Practice Note. This evidence has been prepared in accordance with it and I agree to comply with it. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

Scope of Evidence

- 11 I have been asked by the submitter to review the evidence of Mr Denis Mander on behalf of Queenstown Lakes District Council, and to address his concerns pertaining to the effects of the additional traffic generation on the highway and on district roads in the immediate area (Mander evidence paragraph 10.9) arising from the rezoning sought by the submission.
- 12 By way of background, between 2007 and 2009, I advised Gibbston Valley Station Limited in respect of a resource consent application to facilitate a resort-style complex. This included residential units, visitor accommodation, a restaurant, cellar door and 18-hole golf course. The resource consent application was subsequently granted and has been given effect to (in part).
- 13 My evidence addresses the following matters:
- (a) A brief description of the prevailing and future transportation networks in the area;
 - (b) The traffic likely to be generated by the provisions sought for the zone, compared to existing and consented developments; and
 - (c) An assessment of the performance of the highway and intersections under an increased traffic loading.

Existing and Potential Future Transportation Networks and Volumes

- 14 The submitter's site is located on both the northern and southern sides of State Highway 6 (known in this location as Gibbston Highway), approximately 2km east of the AJ Hackett 'Bungy Bridge' across the Kawarau River.
- 15 In this location, State Highway 6 has one traffic lane in each direction of 3.5m width, with 1m wide sealed shoulders on each side. The carriageway has a centreline and edgeline markings, and the road is subject to a 100km/h speed limit.
- 16 To the east and west of the submitter's site, the alignment of State Highway 6 has a number of both horizontal and vertical curves, but adjacent to the site itself,

the horizontal alignment is generally straight except for one, large-radius curve. There are however several crest curves which restrict the forward sight distance and as a result, there are sections of the highway where there are 'no overtaking' yellow centrelines marked.

- 17 At the eastern end of the site, Resta Road joins the highway from the south at a priority ('give-way') controlled intersection. The intersection does not have any auxiliary lanes for turning traffic. Resta Road itself is largely unsealed with a carriageway of around 5m width, but there is a short sealed section immediately prior to the highway.
- 18 Conversely, at the western end of the site, the main access into Gibbston Valley Wines has an auxiliary right-turn lane and shoulder widening for drivers turning left to start to move clear of the through traffic lane.
- 19 The New Zealand Transport Agency ("NZTA") carries out traffic counts over the whole of the state highway network. There is no traffic count site adjacent to the submitter's site, but the closest location is 2km east of Resta Road. Given the absence of significant development in Gibbston, I consider that the traffic flows in this location will be very similar to those passing the site.
- 20 The NZTA data shows that in 2015 (the most recent year for which data is available), the highway carried an average of 4,580 vehicles per day. I have also reviewed the hourly traffic flows by day of the week, and note that:
 - (a) Daily traffic flows are higher on weekdays than at weekends (an average of 5,360 vehicles on weekdays, compared to 5,080 vehicles on Saturdays and 4,960 vehicles on Sundays);
 - (b) The weekday evening peak is 510 vehicles per hour (two-way), which is the highest hourly volume observed. Traffic flows are approximately evenly split between eastbound and westbound directions;
 - (c) The weekday morning peak is 370 vehicles per hour (two-way), and again traffic flows are approximately evenly split between eastbound and westbound directions;
 - (d) However peak hour flows on Saturday and Sunday lunchtimes are in the order of 480 to 490 vehicles (two-way). The Saturday peak occurs over just one hour, but traffic flows on Sunday are above 470 vehicles (two-way) from 11am to 4pm.
- 21 In my view, these patterns are commensurate with a highway which carries both 'commuter' type traffic as well as serves recreational and tourist-type activities.

- 22 Having reviewed the traffic flows on the road from previous years, an average annual growth rate of 4.1% has been observed.
- 23 The Austroads Guide to Traffic Management Part 3 (*Traffic Studies and Analysis*) sets out a process by which the Level of Service of a road can be calculated and using this, State Highway 6 in this location presently provides Level of Service C. This is described in the Austroads Guide as a “*zone of stable flow, but (where) most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream*”.
- 24 I am not aware of any formal traffic surveys that have been carried out at the winery access, and so I have calculated the anticipated traffic flows based on the consented and constructed development at the site. This is discussed further below. Similarly, traffic flows on Resta Road have not been surveyed but due to the minimal amount of development served, are negligible.
- 25 I have also used the NZTA Crash Analysis System to identify all reported crashes on the highway between 2012 and 2016, plus the partial record for 2017. The area assessed was from 200m west of the entrance to Gibbston Valley Winery, to 200m east of Resta Road. A total of nine crashes were recorded:
- (a) A crash had occurred to the west of the access to Gibbston Valley Winery, and vehicles slowed down to avoid it. However one driver did not notice the vehicles slowing and ran into the rear of the vehicles ahead. This resulted in minor injuries;
 - (b) A driver stopped unexpectedly within the westbound traffic lane adjacent to the entrance to Gibbston Valley Winery. Two following cars managed to avoid the vehicle, but a third vehicle collided with it. This resulted in minor injuries;
 - (c) A driver turning right into Gibbston Valley Winery was overtaken by an eastbound car, and the two vehicles collided. This resulted in minor injuries;
 - (d) A driver turning right into Gibbston Valley Winery failed to notice a westbound vehicle on the highway and collided with it. This resulted in minor injuries;
 - (e) At the curve in the highway approximately 600m east of the access to Gibbston Valley Winery, a westbound driver lost control on a wet road surface and left the road. This did not result in any injuries.
 - (f) At the curve in the highway approximately 600m east of the access to Gibbston Valley Winery, a westbound driver lost control in dark conditions and left the road. This did not result in any injuries.

- (g) Just east of the curve in the highway approximately 600m east of the access to Gibbston Valley Winery, an eastbound driver turned right unexpectedly. Three following drivers managed to take evasive action, but a fourth driver was unsighted and struck the car ahead. This resulted in minor injuries.
 - (h) At the slight curve in the highway approximately 900m east of the access to Gibbston Valley Winery, a westbound driver struck an unknown object on the carriageway, skidded and left the road. This did not result in any injuries.
 - (i) Approximately 200m west of Resta Road, a driver fell asleep and left the road. This did not result in any injuries.
- 26 Three of these crashes have factors unrelated to the highway geometry (a secondary crash arising from an earlier crash, a driver striking an unknown object, and a driver falling asleep). In my view, the provision of chevron arrows at the curves would assist in addressing the two loss-of-control crashes at this location, but this is a matter for NZTA as the road controlling authority. However there have been three injury crashes at the entrance to the winery (one in 2014, one in 2015 and one in 2016), which is higher than I would expect, with the NZTA crash prediction equation suggesting that over five years, just one crash could be expected.
- 27 I anticipate that improved signage would significantly benefit this, since it appears that a contributing factor has been that drivers have failed to notice the access. In the event that the submitter's proposal is accepted, I expect that this will occur.
- 28 The crash rate over the remainder of the highway is commensurate with the national average for highways of this nature.
- 29 I am not aware of any proposals that would change either the geometry or the traffic flows on Gibbston Highway.

Existing and Consented Development, and Proposed Rezoning

- 30 At present, there is a variety of development at the Gibbston Valley Winery, including a winery, cheesery, cellar door, a restaurant and other visitor attractions such as winery tours and a gift shop.
- 31 As I noted previously, I previously provided advice regarding the development of a resort-style development at the winery. The consent allowed for the following:
- (a) 24 residential units;
 - (b) 92 visitor accommodation units;
 - (c) 1,100sqm GFA vintners market / artist retail;

- (d) 54 rooms of staff accommodation;
- (e) Restaurant and conference facility for 120 people;
- (f) A spa; and
- (g) 18-hole golf course, clubhouse and pro shop.

32 These were expected to generate a total of 201 vehicle movements (two-way) in the peak hours, with 11% of these being associated with Resta Road but the bulk being associated with a new vehicle crossing on the highway. An underpass was also proposed, to link the developments on the northern and southern sides of the highway.

33 In this location, State Highway 6 is a Limited Access Road. In practice, this means that any vehicle crossing has to be licensed by the road controlling authority (in this case, NZTA), in respect of the location of the crossing and also the volume of traffic permitted to use it. In respect of the resource consent, the access arrangements (and underpass) were all approved by NZTA, indicating that the Transport Agency did not anticipate that any adverse efficiency or safety-related issues would arise.

34 The Transportation Assessment produced to support the application showed that this scale of development would have a negligible effect on the efficiency of the site accesses with queue lengths in the peak hours of less than one vehicle.

35 Based on the information provided to me, I understand that the proposed rezoning will allow for similar types of activities to the consented development, but potentially to a greater extent.

36 I have been provided with a hypothetical development scenario for this site which I understand represents the upper development limits that the submitter has been evaluating as part of the feasibility for future development. The details of this are:

- (a) 184 residential units (increased from 24);
- (b) 130 visitor accommodation units (increased from 92);
- (c) 90 rooms of staff accommodation (increased from 54 rooms);
- (d) A culinary school for 100 people (a new activity);
- (e) 1,100sqm GFA vintners market / artist retail (spa (as per the consented development));
- (f) A conference facility for 120 people (as per the consented development); and

(g) A spa (as per the consented development).

37 I understand that the 18-hole golf course, clubhouse and pro shop are no longer proposed.

Traffic Generation of the Existing and Consented Development and Proposed Rezoning

38 I am not aware of any specific traffic surveys that have been carried out for the traffic generation of the existing winery. However aerial photographs show that there are a total of 55 parking spaces within the car park. Allowing for robust assumptions of the car park being completely full, and for visitors to stay for one hour on average, this would result in 55 vehicles entering the site access and 55 vehicles exiting in the peak hours.

39 The Transportation Assessment for the consented development set out that the distance of the site from the main centres of Queenstown and Wanaka would result in lower traffic generation rates arising from the residences and visitor accommodation. This is because of ‘trip linking’. In essence, the site is at least a 30-minute drive from Queenstown town centre. Therefore a person living or staying at the site and visiting Queenstown is much more likely to combine several activities while in the town rather than returning to the site in-between. This results in a higher proportion of residents/visitors making just one trip from and to the site (and carrying out multiple activities), rather than making one trip per activity. This will remain the case under the proposed zoning.

40 It was also noted that 80% of the vehicles associated with the development would be associated with destination to/from the west (the direction of Queenstown) with 20% associated with the east (the direction of Cromwell). In my view this will continue to be the case. I have also applied this directional split to the traffic generated by the existing development.

41 In order to calculate the traffic generation of the proposal I have simply factored the traffic generation for the consented development, as follows:

Activity	Consented Development		Proposed Zoning	
	Size	Peak Hour Trips	Size	Peak Hour Trips
Residential	24 units	14	184 units	107
Visitor accom	92 units	46	130 units	65
Conf facility	120 people	24	120 people	24
Staff accom	54 rooms	9	90 rooms	15
Vintners market	1,100sqm	44	1,100sqm	44
Spa	-	5	-	5

Table 1: Traffic Generation of Consented Development and Proposed Zoning

- 42 The commercial development of 1,000sqm and the culinary school of 100 people are new activities. In respect of the commercial development, I understand that it is to be ancillary to the winery activity but for the purposes of this assessment, I have assumed that it may become a destination in its own right, although this very much depends on what tenancies establish. I have applied a typical traffic generation rate for specialist retail, of 5 vehicle movements per 100sqm GFA in the peak hours, which allows for it to be a destination.
- 43 For the culinary school, I have allowed for all attendees to arrive in the morning and depart in the evening, and to stay on the site for the whole day. However I have also anticipated that all students will live away from the site and that none will be staying within the residential or visitor accommodation.
- 44 There are no standard traffic generation figures for such an activity, but making an allowance for all people to travel by car and for two people to share a car, then this would mean that the activity would generate 50 vehicle movements inbound in the morning and 50 vehicle movements outbound in the evening. In practice, this type of activity has the potential for greater car-sharing or the use of minibuses, so I consider that my analyses are robust.
- 45 On this basis, the traffic generation of the development facilitated by the zoning would be:

Activity	Size	Peak Hour Trips	Into Site		Out of Site	
			East	West	East	West
Residential	184 units	107	2	13	18	74
Visitor accom	130 units	65	2	8	11	44
Vintners market	1,100sqm	-	-	-	-	-
Staff accom	90 rooms	15	2	6	2	6
Spa	-	5	1	1	1	1
Conf facility	120 people	24	5	19	-	-
Commercial	1,000sqm	50	-	-	-	-
Culinary sch	100 people	50	10	40	-	-
Total		266	22	87	32	125

Table 2: Traffic Generation of Proposed Zoning (Morning Peak Hour)

Activity	Size	Peak Hour Trips	Into Site		Out of Site	
			East	West	East	West
Residential	184 units	107	14	56	7	30
Visitor accom	130 units	65	8	34	5	18
Vintners market	1,100sqm	44	4	18	4	18
Staff accom	90 rooms	15	2	6	2	6
Spa	-	5	1	1	1	1
Conf facility	120 people	24	-	-	5	19

Commercial	1,000sqm	50	5	20	5	20
Culinary sch	100 people	50	-	-	10	40
Total		360	34	135	30	152

Table 3: Traffic Generation of Proposed Zoning (Evening Peak Hour)

- 46 The Structure Plan for the site shows that traffic will be split over four vehicle crossings:
- (a) the existing winery access;
 - (b) a new access on the northern site of the highway, 200m east of the existing winery access;
 - (c) a new access on the southern side of the highway, 250m west of Resta Road; and
 - (d) Resta Road.
- 47 I understand that the locations and layouts of the two new accesses have been agreed with NZTA. Both include auxiliary lanes for vehicles turning left and right (that is, a left-turn deceleration lanes and right-turn bays). There will also be two underpasses of the highway to ensure that there is a high degree of connectivity between the two sides of the site without the need for vehicles or pedestrians to cross the highway at-grade. For completeness, the existing winery access already has a right-turn auxiliary lane (but no left-turn lane), and Resta Road has neither.
- 48 The connectivity of the site means that it is difficult to be prescriptive about the routes that drivers will use. For example, a person arriving at the culinary school on the north of the highway could use either the existing winery access and the underpass, or the new access. I have assigned the traffic flows onto each access on the basis that drivers will choose the shortest route, and on this basis I consider that:
- (a) 26% of vehicles would use the existing winery access;
 - (b) 38% of vehicles would use the new access on the northern site of the highway, 200m east of the existing winery access;
 - (c) 26% of vehicles would use the new access on the southern side of the highway, 250m west of Resta Road; and
 - (d) 10% of vehicles would use Resta Road.
- 49 In practice, it will be possible to influence this distribution through the use of signage.

Modelling Results

- 50 I have again used the Austroads Guide to Traffic Management Part 3 (*Traffic Studies and Analysis*) to calculate the Level of Service of the highway. Using this, State Highway 6 in this location a 40% increase in through traffic but with no additional development in the site would provide Level of Service D. This is described as being “*close to the limit of stable flow (where) all drivers are severely restricted in their freedom to select their desired speed and to manoeuvre within the traffic stream.*” However it is not an unreasonable level of service for any road in the peak hours.
- 51 Adding the traffic volumes generated by the development facilitate by the rezoning, the highway would continue to provide Level of Service D.
- 52 Taking into account the existing traffic flows at the winery access (a maximum of 110 vehicle movements in the peak hours), coupled with the development facilitated by the proposed rezoning, then:
- (a) 206 vehicle movements would occur at the existing winery access;
 - (b) 143 vehicle movements would occur at the new access on the northern site of the highway, 200m east of the existing winery access;
 - (c) 97 vehicle movements would occur at the new access on the southern side of the highway, 250m west of Resta Road; and
 - (d) 39 vehicle movements would occur at Resta Road.
- 53 I have therefore assessed the performance of this existing winery access, and also the intersection to the immediate east as this would have a greater proportion of vehicles turning right out of the site (towards Queenstown), and the right-turn movement is usually the one where the greatest delays occur.
- 54 In undertaking the modelling, I have also increased the through traffic flows on the highway by 40%, to represent ten years of ambient traffic growth.
- 55 For my assessment, I have used the computer software package Sidra Intersection. For clarity, the default parameters have been used (that is, no adjustments have been made to the basic model). The model results are summarised below:

Road and Movement		Average Delay Per Vehicle (secs)	
		AM Peak	PM Peak
Winery Access	L	4.7	4.9
	R	19.9	21.4
	L	8.0	8.0

State Highway 6 (east)	T	-	-
State Highway 6 (west)	T	-	-
	R	10.5	10.8

Table 4: Delays at the State Highway 6 / Existing Winery Access Intersection

Road and Movement		Average Delay Per Vehicle (secs)	
		AM Peak	PM Peak
Proposed Site Access	L	4.4	4.7
	R	17.2	20.6
State Highway 6 (east)	L	8.0	8.0
	T	-	-
State Highway 6 (west)	T	-	-
	R	10.7	10.6

Table 5: Delays at the State Highway 6 / Proposed New Site Access Intersection

56 It can be seen that both access intersections provide a very good level of service in the peak hours.

57 At the other two site accesses, the amount of turning traffic will be lower than at the winery access. As a result, the delays at these locations will be lower than shown above.

Response to Mr Mander

58 Mr Mander outlines that the potential scale of development under the proposed rezoning is much greater than is presently permitted (Mander paragraph 10.8) and as shown in Table 1, I agree.

59 He then goes on to identify that no analysis has been provided of the effects of the additional development arising from the rezoning, and that this may have adverse effects on the highway and/or the district roads and their intersections (Mander paragraph 10.9). I have set out above such an analysis, adopting conservative assumptions, and this shows that even at the busiest intersection, delays for traffic remain very low.

60 In respect of Resta Road (a district road), the increase peak hour volumes would be in the order of 40 vehicles (two-way) in the peak hours. This equates to one additional vehicle movement every 1.5 minutes, which is not sufficient to give rise to any noticeable increase in delays or queues at the intersection with the highway.

61 There is likely to be a need for some upgrading of Resta Road to accommodate the additional traffic flows because the current formation would be below the appropriate standard in the Subdivision Code. This can be carried out within the

road corridor. However such an improvement would be required under the consented development as well.

62 Consequently, I do not agree with Mr Mander's concerns as to the effects that additional traffic will have on the roading network.

63 In passing, I also understand that NZTA has not made a submission on the submitter's proposed rezoning. This suggests that the Transport Agency is comfortable the traffic-related effects can be managed appropriately on the state highway.

Conclusion

64 Having reviewed the submission made by Gibbston Valley Station Limited, I am able to support the rezoning of the site and do not anticipate that adverse effects would arise. I do not agree with Mr Mander's view on the potential for negative impacts on the district roading network, as my analyses show that the network has ample capacity to absorb the generated traffic even under conservatively robust traffic generation assumptions.

Dated this 12 day of June 2017

Andy Carr