

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

UNDER THE Resource Management Act 1991 (“**Act**”)
IN THE MATTER OF Stage 3b Proposed District Plan – Rural Visitor
Zone
BETWEEN **GIBBSTON VALLEY STATION LIMITED**
Submitter #31037
AND **QUEENSTOWN LAKES DISTRICT COUNCIL**
Planning Authority

**EVIDENCE OF ANDREW DAVID CARR IN SUPPORT OF
THE SUBMISSION OF GIBBSTON VALLEY STATION LIMITED**

29 May 2020

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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 Masters degree in Transport Engineering and Operations and also a Masters degree in Business Administration.
3. I served on the national committee of the Resource Management Law Association between 2013-14 and 2015-17, and I am a past Chair of the Canterbury branch of the organisation. I am also a Chartered Member of Engineering New Zealand (formerly the Institution of Professional Engineers New Zealand), and an Associate Member of the New Zealand Planning Institute.
4. I have more than 30 years' 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 six years ago. 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 involved assessing the traffic generation and effects of large visitor type developments. Of particular relevance is that around ten years ago I provided traffic engineering advice to the submitter to secure the

resource consent for a resort including residential units, visitor accommodation, an 18-hole golf course, galleries and retail spaces, spa facilities, swimming pool, restaurant and conference facilities. This proposal was subsequently consented and I understand it has been given effect to (in part).

8. As the Rural Visitor Zone permits visitor accommodation, commercial recreation activities and ancillary commercial activities, I highlight that my experience also includes numerous applications for visitor accommodation in the district. My most recent completed commissions include:

- i. Assisting the applicant as part of the Environment Court appeal for the Ramada Hotel on Stanley Street, Queenstown (now constructed and open);
- ii. Providing transportation advice for the application to construct a hotel at the corner of Man Street and Brecon Street, Queenstown (now under construction);
- iii. Providing transportation advice for the application to construct a 260-room hotel at the former Kawarau Falls Station, Frankton;
- iv. Assisting submitters opposing a hotel at Filleul Street in Dunedin; and
- v. Independently assessing an application for a 208-room hotel in Tekapo on behalf of Mackenzie District Council.

9. I estimate that in the past 15 years, I have provided transportation advice for around 60 different visitor accommodation proposals, the bulk of which have been within this district.

10. I have also been involved in a number of commercial recreation activities, including:

- i. The Ziptrek within the town centre;
- ii. Assessment of a Ziptrek elsewhere in the district;
- iii. A new bungy jump;

- iv. A jetboating, 4WD buggy and claybird shooting activity (accessed off State Highway 6 further east);
 - v. An extension to Puzzling World in Wanaka;
 - vi. A gold-based visitor attraction in Arrowtown.
 - vii. Several wine tasting / cellar door activities;
11. I have carried out commissions in Queenstown Lakes District for more than 15 years. As a result of my experience, I consider that I am fully familiar with the transportation networks of the district and the particular traffic-related issues associated with the types of activity that could establish within the zoning sought.

Code of Conduct for Expert Witnesses

12. I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court of New Zealand Practice Note 2014 and that I have complied with it when preparing my evidence. Other than when I state I am relying on the advice of another person, this evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

Scope of Evidence

13. In this matter, I have been asked by the submitter, Gibbston Valley Station Limited, to provide an assessment of the transportation-related effects of its submission that an additional parcel of land should be included within the Rural Visitor Zone. For clarity, I was not involved in the submission prior to being asked to prepare evidence.
14. I visited the site in May 2020.
15. Although the zoning sought in the submission limits the type of activity, the site is around 163 hectares, and as such, it is possible that the size of the activities might generate a substantial amount of traffic (although I understand that smaller Development Areas are likely to be identified). Consequently, my assessment therefore does not consider a specific development, but instead, focusses on identifying the spare

capacity that is available on the roading network and which could therefore be used to accommodate increased traffic flows.

Transportation Networks

- 16.** The site does not have direct frontage onto State Highway 6 (known in this location as Gibbston Highway), but onto two Local Roads (as defined in the Queenstown Lakes District Plan), Resta Road and Coal Pit Road. In passing, I note that even if the site was to have direct access, this would be a matter over which the New Zealand Transport Agency has control, since the highway is a Limited Access Road.
- 17.** There is a large gully on the eastern side of the site, which in my view provides a substantial impediment to providing access between large parts of the submission site and Coal Pit Road. However, since it would be possible for Coal Pit Road to be used to gain access to at least some of the submission site, I have considered it within my analysis.
- 18.** Resta Road has a legal width of 20m and is currently formed with a 5m carriageway. It sealed over the first 25m south of the highway but is unsealed thereafter. The alignment is straight and relatively flat over the first 250m, but thereafter the road rises more steeply and becomes curvilinear.
- 19.** Resta Road joins State Highway 6 from the south at a priority ('give-way') controlled intersection. The intersection does not have any auxiliary lanes for turning traffic but has shoulder widening on either side of the highway.
- 20.** Although further east and west, the alignment of State Highway 6 has a number of both horizontal and vertical curves, in the vicinity of Resta Road the horizontal alignment is 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. This includes for the eastbound traffic lane on the highway, immediately west of Resta Road.

21. Approximately 1.5km east of Resta Road, Coal Pit Road joins State Highway 6 from the south. The State Highway 6 / Coal Pit Road intersection already has an auxiliary right-turn lane in place with wide sealed shoulders on either side of the highway such that a left-turning vehicle is able to pull to the side and slow down largely clear of the through traffic lane.
22. Coal Pit Road turns to have an east-west alignment to the immediate south of the highway, and then turns again to run with a north-south alignment, effectively meaning that there is 'dog-leg' alignment in the vicinity of the highway intersection. The road also ascends towards the south of the highway. It is sealed over its full length, but only provides two traffic lanes over the first 150m, and beyond this, the seal width reduces to between 3m and 4m. The legal width of the road is 20m.
23. 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 4km east of Resta Road (and 2.5km east of Coal Pit Road). Given the absence of significant development on this section of the highway, I consider that the traffic flows recorded in this location will be very similar to those passing both Coal Pit Road and Resta Road.
24. The NZTA data shows that in 2018 (the most recent year for which data is available), the highway carried an average of 5,370 vehicles per day. I have also reviewed the hourly traffic flows by day of the week, and note that:
 - i. Daily traffic flows are higher on weekdays than at weekends (an average of 5,610 vehicles on weekdays, compared to 4,850 vehicles on Saturdays and 4,810 vehicles on Sundays);
 - ii. The weekday evening peak is 500 vehicles per hour (two-way), which is the highest hourly volume observed. Traffic flows are approximately evenly split between eastbound and westbound directions;
 - iii. The weekday morning peak is 405 vehicles per hour (two-way), and again traffic flows are approximately

evenly split between eastbound and westbound directions;

- iv. However peak hour flows on Saturday and Sunday lunchtimes are in the order of 470 vehicles (two-way). The Saturday peak occurs over just two hours (11am to 1pm), but traffic flows on Sunday are high from 11am to 5pm.

- 25. 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.
- 26. Having reviewed the traffic flows on the road from the past ten years, an average annual growth rate of 7.9% has been observed (expressed as a percentage of 2008 volumes). While this figure may appear high, it equates to an annual increase per day of just 240 vehicles.
- 27. I also highlight that the growth rate is influenced by recent high growth in tourist volumes. Between 2008 and 2015, the annual growth rate was 4.2%. Between 2015 to 2018, the annual growth rate was 16.8%. In view of the present economic and COVID-19 situation and outlook, I consider it is unrealistic to assume that the past few years of extremely high traffic growth will occur in the short to medium future, but for a robust assessment I have allowed for the growth figure to be 7.9% as calculated above.
- 28. According to the MobileRoad website, Resta Road presently carries 60 vehicles per day with Coal Pit Road carrying 380 vehicles per day. This indicates peak hour flows in the order of 10 vehicle movement and 40 vehicle movements respectively. The volume on Coal Pit Road is higher than on Resta Road due to it serving two wineries (and being signposted as such from the state highway).
- 29. 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. Using this I find that 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”.

- 30.** I have also used the NZTA Crash Analysis System to identify all reported crashes on the roading network in the area. Over the past ten year, no crashes have been reported on Resta Road or its intersection with the highway. On Coal Pit Road one crash has been reported in the past ten years, which occurred when a northbound driver lost control and left the road. It did not result in any injuries. No crashes have been recorded at the State Highway 6 / Coal Pit Road intersection.
- 31.** I have also examined the crash record on the highway between 2015 and the current date, between 200m west of Resta Road and 200m east of Coal Pit Road. A total of four crashes were recorded:
- i. One crash occurred 540m west of Coal Pit Road, at a time when the highway was operating under temporary traffic management due to a concert. A driver entered the wrong traffic lane, and when realising their mistake pulled into the eastbound through traffic lane and struck another vehicle. The crash did not result in any injuries.
 - ii. One crash occurred 370m west of Coal Pit Road, when a westbound driver struck a patch of gravel, lost control and left the highway. It resulted in serious injuries.
 - iii. One crash occurred at the same location, when a westbound driver struck an ambulance that had pulled to the side of the highway as a result of the crash described above. This crash did not result in any injuries.
 - iv. One crash occurred 240m west of Coal Pit Road, when an eastbound driver drifted off the road, overcorrected and left the highway. The crash did not result in any injuries.
- 32.** Two of these crashes have factors unrelated to the highway geometry (one being a secondary crash arising from an earlier crash, and one

being the outcome of temporary traffic management). The remaining two crashes occurred due to driver inattention.

33. Overall, I do not consider that there are any geometric or other deficiencies that could be exacerbated by any increase in traffic arising from development.

Existing and Consented Development, and Previously-Requested Rezoning

34. 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.

35. 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:

- i. 24 residential units;
- ii. 92 visitor accommodation units;
- iii. 1,100sqm GFA vintners market / artist retail;
- iv. 54 rooms of staff accommodation;
- v. Restaurant and conference facility for 120 people;
- vi. A spa; and
- vii. 18-hole golf course, clubhouse and pro shop.

36. These were expected to generate a total of 201 vehicle movements (two-way) in the peak hours, with 11% of these (22 vehicle movements) being associated with Resta Road (for clarity, the bulk of traffic movements were accommodated at different accesses onto the highway). The Transportation Assessment produced to support the application at the time showed that this scale of development would have a negligible effect on the efficiency of the State Highway 6 / Resta Road intersection.

37. I also provided advice for a rezoning in the area as part of Stage 2 of the proposed District Plan, and in order to test this, I assessed the following hypothetical development scenario:

- i. 184 residential units (increased from 24);
- ii. 130 visitor accommodation units (increased from 92);
- iii. 90 rooms of staff accommodation (increased from 54 rooms);
- iv. A culinary school for 100 people (a new activity);
- v. 1,100sqm GFA vintners market / artist retail (spa (as per the consented development));
- vi. A conference facility for 120 people (as per the consented development); and
- vii. A spa (as per the consented development).

38. My calculations showed that 27 to 36 vehicles would use Resta Road in the morning and evening peak hours respectively (again, the bulk of traffic movements were accommodated at different accesses onto the highway). My analysis at the time again showed that this scale of traffic increase would not adversely affect the queues and delays at the State Highway 6 / Resta Road intersection.

Traffic Generation of Requested Rezoning

39. Since there is no specific 'development' proposed by the submission, my analysis focusses on identifying the extent of available capacity at both the I have identified the point at which the State Highway 6 / Resta Road and State Highway 6 / Coal Pit Road intersections would fail to accommodate the expected traffic loading. This is found by identifying the point at which Level of Service D (being stable traffic flow conditions) changes to Level of Service E (that is, unstable traffic conditions). Level of Service is based on the average delay per vehicle, and the transition from D to E occurs when the delay reaches 35 seconds.

40. In order to do this, I have based my assessment on the traffic characteristics that were accepted as part of earlier analyses:

- i. 80% of generated traffic will be associated with the west (the direction of Queenstown) with 20% associated with the east (the direction of Cromwell).

- ii. The right-turn out of Resta Road is the key movement, as this is the movement that has to 'give-way' to the greatest number of other turning movements.
- iii. Ambient traffic growth on the highway should be added to the prevailing traffic flows. For this, I have used a rate of 7.9% as set out above, applied over a period of 10 years. That is, the through traffic on the highway has been increased by 79%.

41. For my modelling, it is necessary to know what proportion of traffic enters Resta Road and what proportion exits. In practice this will differ depending on the type of activity that is established, so for example, in the morning peak hour visitor accommodation will generate more traffic exiting than entering whereas as commercial recreation activity will be the opposite (more traffic entering than exiting). For my analysis I have allowed for the activity that has the strongest peak directions, and thus assumed 75% of the generated traffic exits the site in the morning peak hour, with 75% entering in the evening.

Traffic Effects of Requested Rezoning

42. I have modelled the performance of the State Highway 6 / Resta Road intersection using the computer software package Sidra Intersection, repeatedly running the program to find the extent of traffic flow possible before the right-turn movement changes from Level of Service D to Level of Service E. The results are summarised below for Resta Road accommodating a peak hour two-way traffic flow of 740 vehicles:

Road and Movement		Morning Peak Hour			Evening Peak Hour		
		Avg Delay (s)	Queue (veh)	Level of Service	Avg Delay (s)	Queue (veh)	Level of Service
Resta Road (south)	L	8.1	3	A	7.7	1	A
	R	17.8	2	C	34.9	1	D
State Highway 6 (east)	L	7.9	0	A	7.9	0	A
State Highway 6 (west)	R	9.3	1	A	12.2	3	B

Table 1: Evening Peak Hour Levels of Service at the State Highway 6 / Resta Road Intersection with 740 Vehicles on Resta Road

43. The modelling shows that at this level of traffic, Level of Service D is still provided, but is about to become Level of Service E (when the delay reaches 35 seconds) in the evening peak hour.
44. Even taking into account existing resource consents and earlier assessments of Resta Road (discussed above), the extent of traffic increase is very large. It would, for example, mean that around 730 additional visitor accommodation units could be served by Resta Road, and the volume is far greater than any of the commercial recreation activities with which I have previously been involved (where the traffic flow is limited by the capacity of the activity). In my view, it shows that the State Highway 6 / Resta Road intersection has ample spare capacity available to serve a much greater amount of development than at present.
45. The traffic count data is sourced from a location to the east of Coal Pit Road. Therefore the volume of traffic on the highway passing through the State Highway 6 / Coal Pit Road intersection is the same as for Resta Road, and therefore the calculations will show the same – that Coal Pit Road is able to accommodate up to 740 vehicle movements in the peak hour. The road presently carries a higher traffic flow than Resta Road, but as set out above, the large gully means that Coal Pit Road would serve less of the submission site than Resta Road. Accordingly, I am also of the view that the State Highway 6 / Coal Pit Road intersection has ample spare capacity available to serve a much greater amount of development than at present.
46. Using the Austroads Guide to Traffic Management Part 3 (*Traffic Studies and Analysis*), I have again found the level of service expected to be provided by State Highway 6. Allowing for prevailing traffic growth, but not taking into account the submission site, Level of Service D would arise. This remains in the zone of stable flow. With the traffic generation of the submission site taken into account as set out above, Level of Service D would remain.
47. I note that the level of service on a road or highway and the level of service at an intersection are calculated in different ways. Having

assessed the remaining capacity of the highway, I find that it is able to accommodate a slightly greater increase in traffic volume (around an additional 50 vehicles) before Level of Service E arises. This indicates that it is the capacity of the right-turn movement out of Resta Road and Coal Pit Road that is the limiting factor to the maximum traffic generation of the submission site.

48. With this volume of traffic, the current formation of Resta Road and Coal Pit Road would be unsuitable, Resta Road because it is unsealed and Coal Pit Road because of the narrow seal width. However both have a legal width of 20m, meaning that improvements (and sealing) to achieve an appropriate width for the movement lanes and shoulders can be achieved.
49. I expect that the improvements required to the State Highway 6 / Resta Road, Resta Road itself and Coal Pit Road will lead to improved conditions for drivers, and will either meet current standards (or and departures will have been assessed by the relevant road controlling authority as being appropriate). As such, I do not consider that rezoning the submission site will lead to any adverse road safety issues.

Conclusions

50. 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 efficiency or road safety adverse effects would arise. While there would be a need for roading improvements compared to the current situation (in particular, widening the formation of Resta Road and Coal Pit Road, and the formation of a right-turn lane at the State Highway 6 / Resta Road intersection), these can be accommodated within the current legal widths available.

29 May 2020
Andy Carr