

Before the Queenstown Lakes District
Council

In the matter of The Resource Management Act 1991 (RMA)

And The Queenstown Lakes Proposed District Plan Stage 3
Stream 17 (General Industrial Zone)

Statement of evidence of Andy Carr for Upper Clutha Transport Limited #3256

24 May 2020

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 industrial developments. These have included general industrial units in Wanaka, Queenstown and Christchurch, the rezoning of land to facilitate the North East Ashburton Business Park, several Fonterra milk processing plants, concrete batching plants, a large water storage facility, and gravel extraction facilities. My experience includes assessing request for rezoning (or consenting) land for the purposes of a transportation depot at Ashburton and Rolleston.
- 8 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 applications for industrial activities.

Code of Conduct for Expert Witnesses

9 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

10 In this matter, I have been asked by the submitter, Upper Clutha Transport Limited, to provide an assessment of the transportation-related effects of its submission to rezone 13.89ha of land at Church Road, Luggate, as General Industrial Zone.

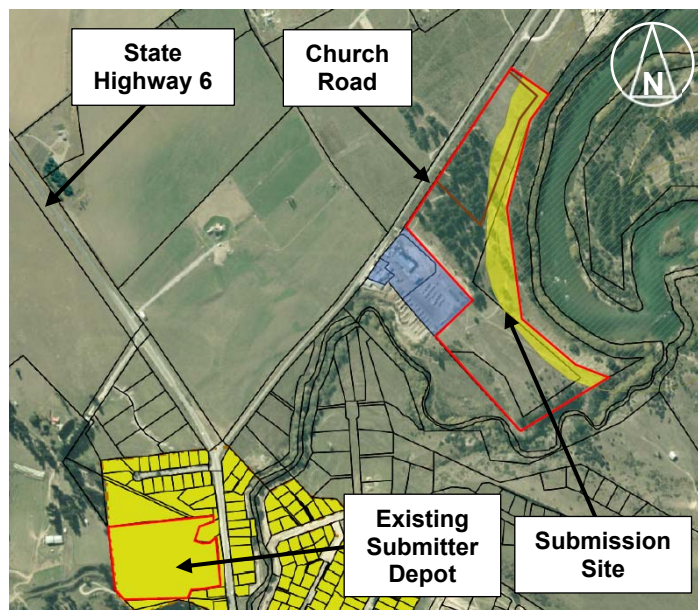


Figure 1: Location of Submission Site (Extracted from Submission)

- 11 Mr Mike Smith, consultant traffic engineer to the Council, has considered the submission and in evidence dated 18 March 2020, has made the following points:
- a. No evidence has been provided to demonstrate that a new industrial zone accessing Church Road where the speed limit is 100km/h will not create any safety issues and such an analysis is necessary.
 - b. The current alignment of Church Road does not present any constraints to achieving a suitably formed connection (access) serving the site that is constructed in accordance with best practice design.

- c. The requested rezoning will require a reassessment of the State Highway 6 / State Highway 8A intersection located northwest of the site.
- d. No assessment has been made of the traffic generation of the site or whether any improvements are required to the current formed width of Church Road.

12 My evidence responds to each of these matters.

13 I visited the site in May 2020.

Transport Networks Adjacent to the Submission Site

14 I agree with Mr Smith's description of the roading network. Church Road is straight and relatively flat with only gentle crest and sag curves, and is formed as a 6.4m wide carriageway within a 20m legal road reserve. There are shallow swales on each side of the road, and the speed limit is 100km/h.

15 According to the MobileRoad website, Church Road carries 50 vehicles per day. Previous counts showed that the peak hour volumes were 10% of the daily flow, meaning that the current peak hour volume is in the order of 50 vehicles (two-way), or an average of around 1 vehicle a minute.

16 I have used the NZTA Crash Analysis System to assess the number of reported crashes on Church Road, between State Highway 6 (excluding the intersection itself) and 100m north of the application site. I have used a period of 10 years in view of the low traffic flows, but no crashes have been recorded within this timeframe.

17 Church Road connects to State Highway 6 at its southern extremity. This intersection is priority 'give-way' controlled with a short auxiliary left-turn lane provided for drivers exiting the highway, and a further auxiliary lane provided on Church Road such that drivers turning left and right can queue side-by-side, separated by a painted island.

18 Again using the NZTA Crash Analysis System, I note that there have been no crashes recorded at the intersection over the past ten years.

19 In the general vicinity of Luggate, State Highway 6 provides one 3.5m traffic lane in each direction with a sealed shoulder varying between 0.5m to 2m (associated with localised widening at intersections). The alignment is gently winding and undulating. The speed limit is 70km/h towards the immediate north of Church Road, but increases to 100kmh around 140m north of Church Road, where there is also a threshold treatment (a localised lane narrowing).

20 South of Church Road, State Highway 6 passes through the existing urban area of Luggate. The road formation is the same, but the speed limit lowers to 50km/h.

- 21 The nearest NZTA traffic counting station is at Albert Burn, around 15km to the south of Luggate (counter 00600917). In 2018, this had an Annual Average Daily Traffic volume of 2,620 vehicles (two-way). The most recent average weekday peak hour volumes are in the order of 310 vehicles (two-way).
- 22 The State Highway 6 / State Highway 8A intersection lies 1.4km northwest of the State Highway 6 / Church Road intersection, and as such, is a 1.8km travel distance from the submission site. It is a large priority ('give-way') controlled intersection, with auxiliary lanes for every turning movement (left and right from the highway, left and right onto the highway). Sight distances for turning drivers are excellent in all directions.
- 23 The NZTA Crash Analysis System shows that there have been crashes recorded at the intersection over the past five years, neither of which resulted in any injuries. One occurred when a driver exited State Highway 8A turning right, and failed to give way to a southbound driver on State Highway 6. The other occurred when a driver exited State Highway 8A turning right, and failed to give way to a northbound driver on State Highway 6.
- 24 State Highway 8A to the immediate east of this intersection is known as Shortcut Road. It provides one 3.3m wide traffic lane in each direction, and the carriageway has a narrow sealed shoulder on either side. The alignment is generally flat, but there are several horizontal curves in the highway.
- 25 The nearest NZTA traffic counting station to Shortcut Road is located at Luggate Bridge (counter 08A00019) some 2km towards the east of the State Highway 6 / State Highway 8A intersection. In 2018, this had an Annual Average Daily Traffic volume of 1,760 vehicles (two-way). The most recent average weekday peak hour volumes are in the order of 160 vehicles (two-way).

Traffic Generation of Proposed Rezoning

- 26 In order to address the matters that Mr Smith raises, it is necessary to firstly understand the potential traffic generation of the submission site.
- 27 The submission made makes it clear that the intent is to use the site to relocate an existing business already within Luggate. From a planning perspective however, this outcome is not a certainty – it would be possible for the land to be rezoned and on-sold to a third party rather than being used by the submitter's business. My analysis is therefore carried out assuming that a new business moves onto the site and seeks to use it in accordance with the underlying zoning.
- 28 I am advised that the provisions sought will impose a maximum building coverage at the site of 25,000sqm GFA. By way of an initial quick check, a development of this scale would require between 1 and 2 spaces per 100sqm GFA (depending on

whether warehousing, distribution or general industrial was consented). Allowing for 25sqm per parking space, this means that 6,250sqm to 12,500sqm of land would be required for car parking. The site is 13.89ha in size (138,900sqm) and buildings and car parking occupying up to 37,500sqm, meaning that from a transportation perspective there is ample room for additional manoeuvring areas typically associated with industrial activities.

- 29 Standard peak hour traffic generation rates for industrial development range from 0.9 vehicles movements per 100sqm GFA (for warehousing) to 2.8 vehicle movements per 100sqm GFA (for contractors yards). As the possible mix is not known (again, assuming a worst case of the site being on-sold), I have adopted a rate towards the upper end of this range, of 2 vehicle movements per 100sqm GFA. Thus the site would generate 500 vehicle movements (two-way) in each of the peak hours.

Possible Safety Issues Associated with the Potential Site Access

- 30 Mr Smith sets out that there are no constraints to achieving an access to the site that meets current design guides and standards, and I agree. The road alignment is straight, there are only gentle (and small) vertical curves, and the wide road reserve mean that in my view there are no reasons why a fully complying design could not be achieved.
- 31 Moreover since the access would require works within the road reserve, any access would need to be subject to engineering approval by the Council. As part of this, Council also has the ability to commission an independent safety audit of the access design.
- 32 I have therefore not commented further on matters relating to the design of the access intersection. However as it will meet current guides and standards, in my view there are no reasons why it should introduce any adverse road safety effects.
- 33 However, the access will introduce new conflicting traffic streams and therefore will increase the risk of a crash. I stress that this is not specific to this proposal, rather, every new access or intersection creates conflicting turning movements and gives rise to the same outcome.
- 34 It is possible to estimate the number of crashes that may arise using the NZTA crash prediction equations. Allowing for the prevailing traffic flows, and assessing the access as a standard priority intersection, I calculate that the presence of the access would give rise to 0.09 new injury crashes per year (that is, 1 new injury crash every 10.5 years).
- 35 I do not consider this figure to be particularly high, and in my view it would not be an effect that is more than minor. I also note that the crash prediction equations

are derived from historic crash records, and therefore they reflect a range of intersection designs, including those that do not meet current standards and therefore may not function as safely as current layouts. In this case, a complying access intersection design can be achieved, meaning that in practice, the crash rate in this location is likely to be lower than forecast.

Assessment of the State Highway 6 / State Highway 8A Intersection

- 36 Mr Smith requests an assessment of this intersection on the state highway network.
- 37 Current traffic volumes are affected by COVID-19 travel restrictions, meaning that a traffic count cannot be undertaken to determine existing volumes. However the existing traffic flows provide a good basis on which to undertake an assessment while allowing for an appropriate margin of error.
- 38 In order to model the current performance of the intersection without the submission site being rezoned, I have made the following assumptions:
- a. 50% of the traffic on the highway will be travelling north and 50% will be travelling south. This reflects the current directions of flow in the peak hours.
 - b. To allow for ambient traffic growth, I have increased the prevailing volumes by 70%. This reflects the prevailing traffic growth, and means that the volumes tested are those that are likely to be present in around ten years
 - c. 90% of traffic emerging from State Highway 8A will be turning right. This is because most drivers heading towards the south will have turned southwards prior to reaching the intersection.
 - d. 90% of traffic travelling north on State Highway 6 will be travelling straight ahead. This is because most drivers heading towards the east will have turned eastwards prior to reaching the intersection
- 39 Finally, I have allowed for 50% of the peak hour traffic generated by the submission to be travelling through the intersection on the highway. In practice, this distribution may change depending on the activities within the site. However I note that as an industrial activity, only Wanaka lies towards the north whereas Cromwell, Alexandra, Clyde, Frankton and Queenstown lies towards the south. In my view, it is likely that there will be a bias towards the south, meaning the distribution I have used is robust.
- 40 I have modelled the performance of the intersection with and without the traffic generation by the submission site, and the results are set out below.

Road and Movement		Peak Hour Without Submission Rezoning			Peak Hour With Submission Rezoning		
		Avg Delay (s)	Queue (veh)	LoS	Avg Delay (s)	Queue (veh)	LoS
SH6 (south)	R	9.9	0	A	11.7	0	B
SH8A	L	9.4	0	A	10.9	0	B
	R	16.6	1	C	29.2	2	D
SH6 (north)	L	8.1	0	A	8.1	0	A

Table 1: Peak Hour Levels of Service at the State Highway 6 / State Highway 8A Intersection

- 41 As would be expected, the increased traffic flows lead to higher levels of delay. However the resultant Level of Service D on the worst-case movement is not unreasonable for an intersection in the peak hour, and queues remain low at just 2 vehicles.
- 42 I have also evaluated the intersection using the crash prediction equations noted above. Under the current traffic loadings (but factored to take account of ambient traffic growth), it could be expected that there will be 0.11 injury crashes per year (that is, 1 injury crash every 8.8 years). With the traffic generation of the proposed submission site added, this would change to 1 injury crash every 8.7 years. I do not consider that this change in crash rate is significant.
- 43 Accordingly I consider that the traffic generation of the rezoned submission site can be accommodated at the intersection without adverse effects on capacity or road safety.

Assessment of the Church Road Formation

- 44 The appropriate formation of a road depends on the volume of traffic that it carries, and the type of activity that it serves. I am aware that to the immediate south of the submission site is an area of Rural Industrial zoned land, and therefore I have evaluated Church Road as a road that services “*make, grow and move*” activities as set out in the Council’s Code of Practice for Subdivision, which covers farms, industry and warehousing.
- 45 As noted above, Church Road has a sealed 6.4m carriageway with a swale on each side.
- 46 Taking into account the current zonings, under the Council’s Code of Practice for Subdivision, the road should have a 1.5m footpath on each side, movement lanes

of 5.5m to 5.7m, and 1m shoulders (0.5m of which should be sealed). Therefore Church Road does not meet the current Code of Practice.

- 47 In the event that the submission site was to be rezoned, traffic flows on Church Road would increase. For a road carrying up to 2,500 vehicles per day (which is more than I consider would arise in this case), under the Council's Code of Practice, Church Road should have a 1.5m footpath on each side, movement lanes of 5.5m to 5.7m, and 1.5m shoulders (1.0m of which should be sealed).
- 48 In other words, the only difference between the formation that Church Road should already have and the formation that is required with the rezoning of the submission site is a widened shoulder, from a 1.0m shoulder of which 0.5m is sealed, to a 1.5m shoulder of which 1.0m is sealed.
- 49 On this basis I consider that it would be appropriate for the submitter to make a contribution towards the widening of Church Road, but only to the extent that their rezoning request gives rise to the need for upgrading the road.
- 50 In passing, I note that under the current or future traffic flows, footpaths are required on each side of the road. In this instance however, there are no other footpaths to which they could connect, since there are none on this section of the highway. Accordingly, I do not consider that footpaths are required on Church Road under either scenario.
- 51 Finally I note that the 20m wide legal road reserve of Church Road means that there are no impediments to achieving a roading improvement scheme.

Conclusions

- 52 Taking account of the comments provided by Mr Smith, I consider that:
- a. I agree with Mr Smith that there are no constraints to achieving a suitably formed connection (access) serving the site that is constructed in accordance with best practice design.
 - b. Taking account of a robust traffic generation of the site, the change in crashes arising from the presence of the new intersection will be very low.
 - c. The State Highway 6 / State Highway 8A intersection located northwest of the site is able to accommodate the increased traffic flows without adverse safety or efficiency issues arising.
 - d. The current configuration of Church Road does not meet the Council's Code of Practice for the type of activities already served. However, the only difference in the layout of the road if the rezoning was approved is that the expected 0.5m sealed shoulder increases to 1.0m. The remainder of the provisions of the Code of Practice are unchanged. The

20m wide legal road reserve of Church Road means that there are no impediments to achieving a roading improvement scheme.

53 On the basis of my assessment, I consider that there are no traffic and transportation reasons why the submission could not be approved, and the site rezoned.

Andy Carr

Dated this 24th day of May 2020