

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

IN THE MATTER of the Resource
Management Act 1991

AND

IN THE MATTER of Stage 3 and 3b of the
Proposed District Plan

**REBUTTAL EVIDENCE OF MICHAEL ANDREW SMITH
ON BEHALF OF QUEENSTOWN LAKES DISTRICT COUNCIL**

**Transport – General Industrial Zone, Three Parks, Rural Visitor Zone and
Settlement Zone (at Hāwea)**

12 June 2020

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1. INTRODUCTION

1.1 My full name is Michael Andrew Smith. My qualifications and experience are set out in my statement of Evidence in Chief (**EIC**) dated 18 March 2020.

1.2 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.

2. SCOPE

2.1 My rebuttal evidence is provided in response to the following evidence filed on behalf of various submitters:

Three Parks:

(a) Antoni Facey for Willowridge Developments Ltd (32020);

General Industrial Zone:

(b) Andrew Carr for Tussock Rise Ltd (3128);

(c) Andrew Carr for Upper Clutha Transport Ltd (3256);

(d) Brett Giddens for Cardrona Cattle Company (4339);

Rural Visitor Zone:

(e) Andrew Carr for Gibbston Valley Station (31037); and

(f) Jason Bartlett for Matakauri Lodge Limited (31033).

2.2 I have asked Ms Scott to seek an extension for me for my rebuttal evidence to Andrew Carr for Universal Developments.

SUBMITTER EVIDENCE ON REZONING REQUESTS – THREE PARKS

3. ANTONI FACEY FOR WILLOWRIDGE DEVELOPMENTS LTD (32020)

- 3.1 Mr Facey has filed evidence in relation to the technical and safety aspects of constructing a new link from the proposed Three Parks development onto Ballantyne Road. I did not address this rezoning in my EIC. Mr Facey states at paragraph [7] that his “*evidence considers only the effects of the proposed new Ballantyne Road / Proposed Structure Plan Road intersection as shown in Figure 2.*”
- 3.2 The structure plan for Three Parks in the ODP has a collector road with an intersection to Ballantyne Road that is some 40m south of Golf Course Road. The same location is shown in the PDP Three Parks structure plan. Willowridge seek that the road alignment and Ballantyne Road intersection be moved.
- 3.3 I have copied the referenced “Figure 2” below, as well as Figure 3 of Mr Facey’s evidence which shows the current Structure Plan intersection location, as well as the Willowridge proposed intersection, which is at the current Golf Course Road and Ballantyne Road intersection (**Willowridge intersection**).



Figure 2: Willowridge Proposed Structure Plan



Figure 3: Proposed intersection location compared to ODP.

3.4 Regarding the Willowridge Intersection, Mr Facey states at paragraph [8]:

The alignment is along a narrow approximately 15-metre-wide strip linking the bulk of the land with Ballantyne Road. The alignment would likely result in a left-right staggered cross roads intersection.

3.5 It is further presented in Paragraph [21] that:

It is acknowledged that there is limited sight distance from Golf Course Road along Ballantyne Road. While the lack of sight distance has not contributed to a significant safety problem, this is likely to be due to the simple Tee intersection layout with few conflicts allowing the drivers to concentrate on only a maximum of two vehicle approaches at one time and decision making is quicker. It is considered that adding a fourth leg to the intersection will create a more complex intersection and drivers will need more time to make decisions and consequently need more visibility.

3.6 Mr Facey discusses a change of intersection form at the Willowridge Intersection, with the presentation of a roundabout design solution.

3.7 He presents at paragraph [24], that a critical element of a safe intersection design relates to appropriate sight distances from the intersection. I concur, but add to this that the appropriate sight distance is based upon the design (or legal) speed.

3.8 Mr Facey's design appears to be based on QLDC proposing to reduce Ballantyne Road to a 40 km/h speed limit. QLDC resolved the following in regard to the speed limits, which came into effect in May 2020:¹

- (a) Ballantyne Road (Riverbank Road to State Highway 6) – 60km/h (dropping from 80km/h) – not relevant to the rezoning; and
- (b) Ballantyne Road (Golf Course Road to Riverbank Road) – 50km/h (dropping from 70km/h).

1 <https://www.qldc.govt.nz/services/transport-and-parking/road-safety-and-speed>

- 3.9** Based upon this, I find that the design parameters that Mr Facey have suggested are for an incorrect speed environment, although if he has considered 40km/h (it is not clear) this value is more constrictive on the safe operation of a roundabout when compared to that for a higher speed. A lower design speed would result in a roundabout design that is smaller, and thus the turning radius and approach road alignment design would not match that required for the current higher speed limit. The use of the lower incorrect speed for the design would result in significant road user safety issues.
- 3.10** Returning to Mr Facey's evidence on intersection form, there is a significant difference in form and function between the current intersection (a Tee intersection), and a staggered off-set intersection as proposed. A Tee intersection has significantly fewer conflict points (points where vehicles paths cross), than that for a staggered crossroad type intersection.
- 3.11** Mr Facey in Paragraph [13] states:
- Due to the uncertainty of the traffic counts and the potential traffic generation from the Three Parks approach to the intersection, it is not possible to determine whether the cross roads intersection would have sufficient capacity at this stage. However, there are standard relationships available for higher levels of control such as roundabouts.*
- 3.12** In considering this statement, I am of the opinion that insufficient investigation and design consideration has been undertaken to determine the appropriate intersection type, however I concur that a roundabout could be a suitable solution, if designed correctly (which I return to below).
- 3.13** Mr Facey at his paragraph [8] suggests a new road connecting to Ballantyne Road will follow a 15m strip along the property boundary, forming an offset connection with Ballantyne Road. To assist the Court, I present below the property boundary information obtained from the QLDC GIS website. The proposed land strip is that following the tree line to the top of the land information (arrowed). The blue lines represent land property boundaries.



- 3.14** This demonstrates that in following the existing land strip as indicated in the figure above, the connection point is offset from the Golf Road connection. Mr Facey states at paragraph [13] *“it is not possible to determine whether the cross roads intersection would have sufficient capacity at this stage...”*.
- 3.15** In my opinion, this demonstrates that the proposed crossroad intersection may be inappropriate for the intended connection, and that further in-depth analysis would be required.
- 3.16** Furthermore, there is a boundary line / property that would be affected to align the road connection to a possible roundabout formation location. A compliant design for a roundabout requires that all four legs connect to a central point, and that the approach alignments meet the desired deflection requirements to ensure safe use. It is my opinion that this cannot occur given the current approach alignment.
- 3.17** The formation of a compliant roundabout on Ballantyne Road will be determined by the underlying legal speed, and the tracking movements of the appropriate design vehicles. Given that Ballantyne Road is a major access to the General Industrial Zone along Ballantyne Road, it is fair to assume that the roundabout would be required to accommodate truck and trailer units.

- 3.18** For a compliant roundabout to be formed, appropriate land should be available to ensure that it can be formed. The applicant has not demonstrated a specimen design, so it is uncertain if the roundabout could be formed in the current road reserve. Failure to ensure appropriate land is set aside for a compliant roundabout could result in the inability to form the roundabout at a later stage.
- 3.19** The current land corridor does not connect to a central point where it is considered a roundabout could be constructed. The approach would require an alignment to extend over the adjacent land title. This shift would require protection from future building and development, to ensure that a compliant design could be installed.
- 3.20** I find that there is insufficient information to demonstrate that a compliant roundabout option could be formed at the proposed junction. When I consider the current property boundaries, I consider that the application has failed to demonstrate that a compliant roundabout could be constructed.

SUBMITTER EVIDENCE ON REZONING REQUESTS – GENERAL INDUSTRIAL

4. ANDREW CARR FOR TUSSOCK RISE LTD (3128)

- 4.1** Mr Carr has filed evidence in relation to an assessment of the transport related effects of the submission by Tussock Rise Ltd. I did not address this rezoning submission in my EIC. The submission relates to a 93,293 m² land parcel located between Gordon Road and the north western end of Connell Terrace. This portion of land also abuts onto the Bright Sky Land Ltd development (Submission 3130) and indirectly with Alpine Estates Limited (Submission 3161).
- 4.2** Mr Carr has presented the assessment of the site at an isolated level, that is, it does not consider the effect of access possible over this development as a result of an adjacent development. Any development in this area has two key links to the surrounding road network, being via Avalon Station Drive, and Gordon Road / Connell Terrace / Fredrick Street. Mr Carr presents in paragraph 25 the

proposal to develop the link between Avalon Station Drive and Gordon Road.

4.3 Paragraph [28] and [29] of Mr Carr's evidence presents a narrative around the Bright Sky Special Housing Area, commenting that he understands that this application has since been withdrawn (which I understand to be correct, given the change in underlying zoning to a residential zone).

4.4 When considering the larger environment, given the proximity of adjacent developments / appeals it is essential that an assessment is provided that considers the impacts of the interconnections and access routes. Mr Carr comments at paragraph [43]:

It is possible that there would be further roading links through the SHA site towards the southwest of the submission site. I have not allowed for these, as the development pattern in the SHA site is not confirmed.

4.5 Critical to this assessment is the likely impacts of all traffic through the proposed zones requested, and the impacts on elements such as safe routes for school, cycle connections and pedestrian linkages. A narrative is presented around the Mix of Road Users,² whereby it is presented that the current road layout of Connell Terrace and Frederick Street meet the Council's Code of Practice, but that Gordon Road does not. It is further presented, based upon the applied traffic assessment, that Gordon Road has sufficient width to allow improvements to ensure compliance, but would require potential reconstruction of road width and or footpath widths. Mr Carr states at paragraph [72] that:

On this basis, two of the roading connections already meet the Code of Practice for walking and cycling provision, and only relatively minor changes are required for the third connection in order to meet the Code. I therefore do not consider that the concerns of the Council regarding the mix of road users are relevant for this particular site.

4.6 I find this in conflict with Mr Carr's earlier comments,³ where he details the need to separate residential traffic from larger industrial traffic.

2 Mr Carr's evidence at paragraphs [68] – [72].

3 Mr Carr's evidence at paragraphs [64]- [67].

Given that cyclists and pedestrian are the more vulnerable road user, I would expect that specific provision for the safe movement of these modes through areas such as Connell Terrace and Gordon Road.

- 4.7** I am of the opinion that the proposal fails to identify the potential overall effects of the surrounding land use connection and impacts of traffic on the safe movement of all road users.

5. ANDREW CARR FOR UPPER CLUTHA TRANSPORT LTD (3256)

- 5.1** Mr Carr has filed evidence in relation to an assessment of the transport related effects of the submission by Upper Clutha Transport Ltd. The submission relates to the rezoning of a 13.89 ha land parcel from Rural to General Industrial Zone (**GIZ**) located between Church Road and the Clutha River.

- 5.2** Mr Carr details that in response to matters raised in my EIC,⁴ that *“I am advised that the provisions sought will impose a maximum building coverage at the site of 25,000sqm GFA.”* This equates to approximately 27% of the total land area of the subject site. This matter is critical to the assessment that Mr Carr has undertaken, and I relate my response to this, and the matter of the trigger for the road upgrade.

- 5.3** In the matter of the traffic volume and impacts generated by a development building coverage limited to 25,000m², I concur with Mr Carr’s assessment. However, Mr Carr has not detailed what the impact of the development coverage area would have should a rule not be imposed. I am of the opinion that the traffic effects for an unencumbered development, and hence road formation requirements on Church Road, would be significantly greater than that stated by Mr Carr. This test has not been presented to allow consideration of effects.

- 5.4** The applicant has outlined that they sought for workers accommodation inclusion within the GIZ. The applicant stated that it was sought for approximately 30 drivers (paragraph 3.8 of Scott Edgar’s evidence). The proposal does not specify a mechanism for the

4 Mr Carr’s evidence at paragraph [28].

provision for a cap on worker accommodation numbers. I note that Mr Carr has not made any reference to the assessment of effects and traffic generation associated with the relief sought by the applicant for the inclusion of workers' accommodation. Rather, he has concentrated on the potential effects related to a yield from a maximum coverage area of 25,000m².

5.5 In this regard, I find that this matter is unassessed, and the net traffic effects related to the proposed worker's accommodation are not stated. The inclusion of workers' accommodation within the zone would therefore only have a cap as detailed within the District Plan and could result in adverse effects not anticipated if a large proportion could be made workers accommodation.

5.6 Mr Carr, at paragraph [49], states:

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.

5.7 In reviewing this element, I am unable to see the mechanism that the applicant proposes to ensure this happens. On this basis there is insufficient evidence as to who, when and how this road upgrade would be enacted.

5.8 Given my opinion stated in paragraph 5.3 above, I am also of the opinion that the nature and extent of upgrade required has not been determined, if one was to consider the unencumbered development area. I further find that the assessment of the potential impacts of the Worker Accommodation provision has not been assessed, as detailed in paragraph 5.4.

6. BRETT GIDDENS FOR CARDRONA CATTLE COMPANY (4339)

6.1 I have reviewed the evidence of Brett Giddens, specifically those relating to Transport as outlined in paragraph 70 – 73. I note the material presented. Mr Giddens advises that they have commenced discussions with Waka Kotahi NZ Transport Agency with regard to the

junction with the State Highway. There is no evidence of progression of the discussion, nor any outcomes.

6.2 I remain of the opinion as stated in my EIC.

SUBMITTER EVIDENCE ON REZONING REQUESTS – RURAL VISITOR ZONE

7. ANDREW CARR FOR GIBBSTON VALLEY STATION (31037)

7.1 Mr Carr has filed evidence in relation to an assessment of the transport related effects of the submission by Gibbston Valley Station Ltd. I did not address this submission in my EIC. I have been requested to review the transport evidence now submitted.

7.2 This submission relates to the rezoning of a parcel of land of approximately 163 hectares located the local roads, being Resta Road and Coal Pit Road, from part Gibbston Character Zone and Rural, to Rural Visitor Zone.

7.3 I note Mr Carr's comment in paragraph [15] that his evidence focusses on the spare capacity that is available on the roading network, and which could therefore be used to accommodate increased traffic flows. He details that his evidence does not consider the specific development.

7.4 I acknowledge the assessment made of the local roads as detailed in paragraphs [16-22] of his evidence. I will therefore use these details in my rebuttal.

7.5 The assessment of traffic volume⁵ has indicated that there may be spare capacity at the current intersections when considering the point of change in Levels of Service (**LOS**) as described below. I note that this assessment considers a baseline assessment, of typical flow across the year. Previous assessments for developments in Queenstown have acknowledged the use of summer conditions with analysis reports indicating that the peak hour volumes (typically

5 Mr Carr's evidence at paragraphs [42] - [49].

weekend midday) could be 30-40% higher than the stated annual average daily traffic (**AADT**).

7.6 In paragraph [39], Mr Carr presents that his assessment does not consider the specific development effects as these are unknown from this proposal. Rather, his focus is on the point when traffic generation would change from LOS D to LOS E for the respective intersections described in his evidence.

7.7 At paragraph [29], Mr Carr presents the description of LOS C, however in paragraph [39] there is no description of LOS D or LOS E provided. For the purposes of the hearing I wish to provide these descriptions, as they set the framework for assessment.

Level of Service D:

(a) Close to the limit of stable flow and approaching unstable flow. All drivers are severely restricted in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is poor, and small increases in traffic flow will generally cause operational problems.

Level of Service E:

(b) Occurs when traffic volumes are at or close to capacity, and there is virtually no freedom to select desired speeds or to manoeuvre within the traffic stream. Flow is unstable and minor disturbances within the traffic stream will cause breakdown.

7.8 In reviewing Mr Carr's assessment parameters I am of the opinion that the point of change from LOS D to LOS E is outside of what should be considered satisfactory for the development of a new land use zone. In reaching this point of consideration, I am concerned that the impact on capacity and movement will result in driver frustration and unsafe movements.

7.9 In my opinion, setting a consideration bar at this point fails to address the Government's Vision Zero objectives, and does not comply with a

Safe Systems approach. The Ministry of Transport details the following in regard to the two systems:

Vision Zero

- (a) Vision Zero is a world-leading approach to road safety that says:
 - (i) no loss of life on the roads is acceptable
 - (ii) road deaths and serious injuries are preventable
 - (iii) people make mistakes and are vulnerable – we need to stop simple mistakes turning to tragedies
 - (iv) safety should be a critical decision-making priority in our transport decisions
 - (v) we need to focus on shared responsibility between road users, and the people who design and operate our roads.

The Safe System

- (b) Vision Zero is founded on the safe system approach that says that while we all have a responsibility to make good choices, people make mistakes so we need to build a more forgiving road system that protects people from death and serious injury when they crash.
- (c) Instead of focussing on a single safety intervention, such as improving driver behaviour, the safe system looks at all elements of road safety working together.
- (d) Under a safe system, we should work to:
 - (i) improve the safety of our roads, for example with median barriers, improved roadsides, safer intersections and separated cycle lanes and foot paths;
 - (ii) strive for travel speeds to be safe and appropriate for the function and use of the road so that road users can survive the crashes that happen;

- (iii) improve the safety of our vehicles, for example with electronic stability control, front and side curtain airbags, and collision avoidance systems;
- (iv) support road users who are competent, alert and unimpaired; they comply with road rules, take steps to improve road safety and expect safety improvements.

7.10 When considering the Vision Zero and Safe Systems approach, an objective should be on what is required to achieve a level of service that provides a suitable level of safety, and eliminates, as far as practicable the risk of any high severity crashes.

7.11 If a lower boundary of Level of Service change is considered, it is unclear if there would be spare capacity available, as this is untested. However, using this lower level, which would fit with the Governments targets for road safety. A lower level also has an impact on when, and to what extent any improvements to the intersection form would be required to upgraded to ensure safe traffic flow is achieved.

7.12 I note in viewing Google Earth™ Street View imagery, that the Resta Road intersection has displayed a high level of road edge damage already, as indicated in the image below.



7.13 This damage includes edge break (damage to the seal edge and steep drop off), and extensive use of the left-hand shoulder (unsealed) by a following vehicle traversing to the left around a right turning vehicle

- 7.14** Mr Carr presents that a larger proportion of traffic would enter and exit the proposed site via Resta Road, because this better serves movement to and from Queenstown. Hence, improvements may be required to the Resta Road / SH 6 intersection earlier than the Coal Pit Road / SH 6 intersection.
- 7.15** To this end, it is considered that as a land use is developed, there would come a point at which consideration of an intersection change would be required. There is a lack of any narrative on how this would occur, or if this would in fact be triggered by the desired land use change at an early stage, or latterly in the development.
- 7.16** I concur with Mr Carr that each of the local roads can be upgraded to a level that would enable the safe passage of a higher traffic volume, similarly, theoretically, the intersections could be upgraded, providing that approval is obtained from the Transport Agency, and that there is land available for the required improvement.
- 7.17** On this latter point, land, it is noted that the land adjoining the State Highway is not on the applicant's title, and as such there is no guarantee that land could be obtained for an improvement, where the design required adjacent land. Having a land use designation that could not be fully enacted due to the inability of any intersection improvements considered necessary in latter assessments would be problematic.
- 7.18** I conclude that the land use change as presented, would most likely produce traffic volumes that would be acceptable, but would require improvements at a future date. The applicant has not detailed a mechanism for the trigger of these improvements to be considered, nor the mechanism of how and who would subsidise the required improvements. This includes any potential improvements required by the Transport Agency to enable them to comply with their objectives under Vision Zero and the Safe Systems approach.

8. JASON BARTLETT FOR MATAKAURI LODGE LIMITED (31033)

8.1 Mr Bartlett has filed evidence in relation to an assessment of the transport related effects of the submission by Matakauri Lodge Limited. I did not address this submission in my EIC. I have been requested to review the transport evidence now submitted.

8.2 This submission relates to the rezoning of 569 Glenorchy-Queenstown Road which is legally described as Lot 2 DP 27037 and Section 1-2 Survey Office Plan 434205, from Rural Lifestyle Zone to Rural Visitor Zone.

8.3 Mr Bartlett presents in paragraph [13] that access to the proposed property is via a Right of Way (**ROW**) over Crown (Department of Conservation) land, with the ROW being limited to 6 metres in width. This is considered critical information when considering the assessment proposed by Mr Bartlett.

8.4 Mr Bartlett states at paragraph [16], when considering the existing environment, states that *“it is likely that the typical traffic flow on Farrycroft Row will be below 150vpd or less than 25vhp¹ during the peak hour.”* This would suggest that a detailed traffic survey has not been undertaken, and that actual traffic flows are not certain.

8.5 I find no reference to the possible traffic generation for the proposed RVZ, but do note in Mr Bartlett’s evidence⁶ that a Resource Consent (on hold by applicant), applied for an expansion for 46 guests. It contained the following comment with regards to improvements to the ROW:

If undertaken, these improvements can be relied upon to allow for additional visitor accommodation facilities at the site with a traffic generation limited such that Farrycroft Row will have a traffic flow of less than 200vpd.

8.6 From this I infer that there is some mechanism in the current PDP zone that would limit traffic generation. That mechanism is not detailed and

6 At paragraph [32].

at present there is no resource consent or certainty that (if issued) it would be implemented.

- 8.7** Mr Bartlett states at paragraph [33] that an appropriate environment could be created to accommodate up to 200 vehicles per day (**VPD**). It is explained that the likely mix would be the current adjacent lots serviced by the ROW, plus 50 guests (25 visitor rooms) at Matakauri Lodge. This is only an increase of 4 guests above the current Resource Consent application, which is on hold. And an increase of 18 guests above the already consented 32 guests (16 room) development on site.
- 8.8** At paragraph [32], Mr Bartlett states that there are mitigation measures proposed in the Resource Consent application that would mitigate the current narrow ROW, to improve user safety, as detailed in the Council's response to the Resource Consent. For the information of the hearings panel, this assessment was undertaken for Council by Stantec, the consultancy that I work for. I was a road safety advisor to the review of the assessment at the time of the review undertaken by Stantec.
- 8.9** The review of Stantec was limited to the Safety elements of the ROW. This identified that there were safety issues present due to the narrow nature of the ROW, the lack of safe passing opportunities, and the location of the proposed widening. Comment was also submitted to Council on safety concerns relating to the form and function of the Farrycroft ROW junction with Glenorchy-Queenstown Road. In Mr Bartlett's assessment in paragraph [32(a)], I concur with the approach detailed, however, the advice of Stantec to Council was for the formation of a 6-metre-wide bay for passing, allowing for larger vehicles to pass safely.
- 8.10** As detailed in Section 8.3 above, the legal width of the ROW is 6 metres. The ROW traverses around a hillside and is characterised by a vertical bank above the ROW, and a down slope below the road. Any widening required for this ROW would also require excavation / fill to obtain the desired width. Critical to this occurring, it is noted that the ROW extends over Crown land. For any improvements to occur, I

would expect that there would be a requirement to alter / change the ROW over the Crown land and would require approval by the Crown. This is not covered in Mr Bartlett's evidence. Therefore, should approval not be granted through the resource consent, then the detailed widening would not be permitted to be undertaken. This includes any improvement to the ROW junction with Glenorchy-Queenstown Road.

8.11 The intersection of the ROW with Glenorchy-Queenstown Road is considered a poor design, with the ROW being characterised by an acute turn from the main road, a steep alignment to the intersection, and a rapid change in grade from the main road to the ROW. These elements are presented below:

- (a) Alignment onto ROW. A left turn entry into the ROW requires the driver to negotiate a turn of approximately 135 degrees. This requires the driver to return back towards the direction that they came from, through a tight radius turn, estimated to be around 5 m radius.
- (b) Steep alignment. The ROW descends to the main road at a steep gradient. This is demonstrated in the image below.



Source: google Earth™

- (c) Rapid Change in grade. Due to the tight turn and the gradient change, the inside track for a left turn traverses through a rapid gradient change. This rapid change presents problems for vehicles undertaking a left turn.

- 8.12** A rapid change in grade, associated with a very tight turn onto a steep traffic lane will result in drivers traversing across to the opposing traffic lane to undertake the turn. I observed this occurring in a previous trip to Queenstown, where a taxi traversed into my lane (I was travelling towards Queenstown) to undertake the left turn. Similarly, a left turn in movement results in the driver traversing into the opposing side of the road in the ROW. This movement conflicts with an outbound movement from the ROW. It is noted that the rapid elevation gain on the ROW would result in an exiting driver not being aware of a left turn in vehicle due to only being able to see the top side of a car, and similarly, a driver entering would not have observation of an exiting car.
- 8.13** The left turn in movement is extremely difficult for a larger vehicle such as a rigid truck or a coach. Paragraph [24] of Mr Bartlett's evidence confirms that large vehicles are having difficulties and has stated that there are recorded incidences of larger vehicles being grounded at this intersection. This causes a safety issue for vehicles on the through movement on Glenorchy-Queenstown Road. Mr Bartlett (Paragraph [34] details that the arrival of larger vehicles is currently about monthly. He then comments that an increase *"may occur should any future on-site activity result in tour groups entering the site or involve visitor accommodation for tour groups."*
- 8.14** Mr Bartlett⁷ offers a solution for large vehicle access. He states, *"larger vehicles such as large rigid trucks or bus/coach vehicles should only use this intersection by turning left from Farrycroft Row (towards Glenorchy) or right to Farrycroft Row (from Glenorchy)"*.
- 8.15** I am of the opinion that this solution is not feasible, as a driver would not know the required actions when they visit the site. Furthermore, Mr Bartlett fails to address the discussion as to where and how a large vehicle could undertake such a movement on Glenorchy-Queenstown Road. The proposal would require a driver of a large vehicles to travel past site, identify a safe turn location on a road with a tight alignment, turn and return for the right turn in. I am of the opinion that this solution is unworkable, and will lead to a high level of non-compliance, greatly

7 Mr Bartlett's evidence at paragraph [24].

increasing the safety risks at the intersection during use by large vehicles and coaches.

8.16 Mr Bartlett presents at paragraph [22] an outline of the sight lines, and an assessment against “The absolute minimum” Safe Intersection Sight Distance. I note the SISD values presented by Mr Bartlett on the assessment of the sight line distance at the intersection.

8.17 The assessment of appropriate intersection form with regard to sight should be assessed against three matters⁸, being:

- (a) Approach Sight Distance (ASD);
- (b) Safe Intersection Sight Distance (SISD);
- (c) Minimum Gap Sight Distance (MGSD).

8.18 Of these, I will address the SISD as referenced by Mr Bartlett.

8.19 In considering Mr Bartlett’s use of 141 metres for the SISD value, I comment that this is in fact the absolute minimum for a driver reaction time of 1.5 seconds. The AUSTROAD guide details the following with regard to reaction time:

“A 1.5 s reaction time is only to be used in constrained situations where drivers will be alert. Typical situations are given in Table 4.2 of the Guide to Road Design – Part 3: Geometric Design (Austroads 2009a). The general minimum reaction time is 2 s.”

8.20 Typically, a reaction time of 1.5 seconds is constrained to urban use. This site is rural, with vast vistas of the lake, therefore a reaction time value of 2.5 seconds would be more appropriate. In addition, the assessment of an appropriate SISD is also based upon the underlying legal road speed, not an interpreted curve speed.

8.21 Based upon the road being 100 km/h, along with a reaction time of 2.5 seconds, the required SISD would be 262 meters. This is in excess of 100 meters over the current available sight line. Testing this for the assumption of Mr Bartlett of a speed based upon an assumed curve

8 AUSTROADS AGRD Part 4A – 09; Unsignalised and Signalised Intersections, Section 3.2

environment speed (70 km/h), the required SIDS would be 151 meters, assuming a reaction time of 2 seconds. The table does not detail a sight distance value for 2.5 seconds reaction time as the underlying premise for the 70 km/h speed is that it is the legal speed, and this speed typically applies to an urban or peri-urban environment. This not the environment, therefore a reaction time of 2.5 seconds is applicable. I therefore find the available sight lines insufficient for the proposed change sought that would increase the traffic volume.



Michael Andrew Smith

12 June 2020