

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

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of Hearing Stream 15: Open Space and
Recreation, Earthworks, Signs,
Transport, Visitor Accommodation

**STATEMENT OF EVIDENCE OF ANDY CARR
ON BEHALF OF BRIDESDALE FARM DEVELOPMENTS LIMITED (#2391)**

1. Introduction

- 1.1 My full name is Andrew (Andy) David Carr.
- 1.2 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.
- 1.3 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.
- 1.4 I have more than 28 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.
- 1.5 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.
- 1.6 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.
- 1.7 I have carried out a number of commissions which have involved assessing the traffic and transportation effects of recreation facilities. This has included providing advice to the submitter's proposal for a tennis academy towards the south of Bridesdale Farm, for the designation of recreational facilities in Mosgiel, and the comparative assessment of potential sites for the Wanaka aquatic centre. I have advised Selwyn District Council in respect of the redevelopment of community centres (which includes playing fields) in

Darfield and Tai Tapu, and I previously provided advice to the Queenstown Lakes District Council for the consenting of the Alpine Aqualand facility on Joe O'Connell Drive. At a larger scale, I have provided transportation advice for the temporary AMI rugby stadium in Christchurch and for the New Zealand Golf Open championship held at The Hills in Arrowtown.

- 1.8 As a result of my experience, I consider that I am fully familiar with the traffic and transportation characteristics of a range of recreational facilities.
- 1.9 I have worked in the district for over 14 years and have provided advice for nearly a hundred separate projects, ranging from large plan changes to the redevelopment of individual sites. As a result of this, I consider that I have a thorough understanding of the practical operation of the roading networks.
- 1.10 I have read the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2014. This evidence has been prepared in accordance with it and I agree to comply with it. The matters addressed in this Statement of Evidence are within my area of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

2. Scope of Evidence

- 2.1 In this matter, I have been asked by the submitter, Bridesdale Farm Developments Limited (**the submitter**), to comment on their submission seeking that two areas of land owned by the Council be rezoned Active Sport and Recreation rather than Informal Recreation, and a third area owned by the submitter be rezoned as Active Sport and Recreation rather than Rural.
- 2.2 In order to assess the transportation matters associated with the requested rezoning, I have necessarily had to identify the types of activities which could establish and their consequential traffic generation. I am aware that a rezoning does not generate traffic per se, but equally, without some assessment of the expected volumes of vehicles, it is not possible to identify whether the rezoning could be appropriately accommodated on the transportation networks.
- 2.3 My evidence is structured as follows:
 - a. An assessment of the activities which could establish and their traffic generation;

- b. An assessment of the transportation environment;
- c. Whether the anticipated volumes of pedestrians, cyclists and motorised vehicles could be accommodated;
- d. Consideration of the Officer's Reports; and
- e. Conclusion

2.4 In preparing my evidence, I have reviewed the Statement of Evidence of Dr Shayne Galloway, and a report prepared by Fluent Solutions in respect of the flooding potential for the site ('Winton Tennis Academy – Flood Risk Assessment', dated 30 May 2018). I have also reviewed the Statement of Evidence of Ms Galavazi and the s42a report of Ms Edgley.

3. Activities which could Establish and Traffic Generation

3.1 I understand that there are three areas which are the subject of the submission (as shown on the second page of the submission and below), and I adopt the naming of these used by Dr Galloway as the 'River Flats'. The easternmost parcel of land is within the ownership of the submitter, with the central and western parcels being owned by the Council.

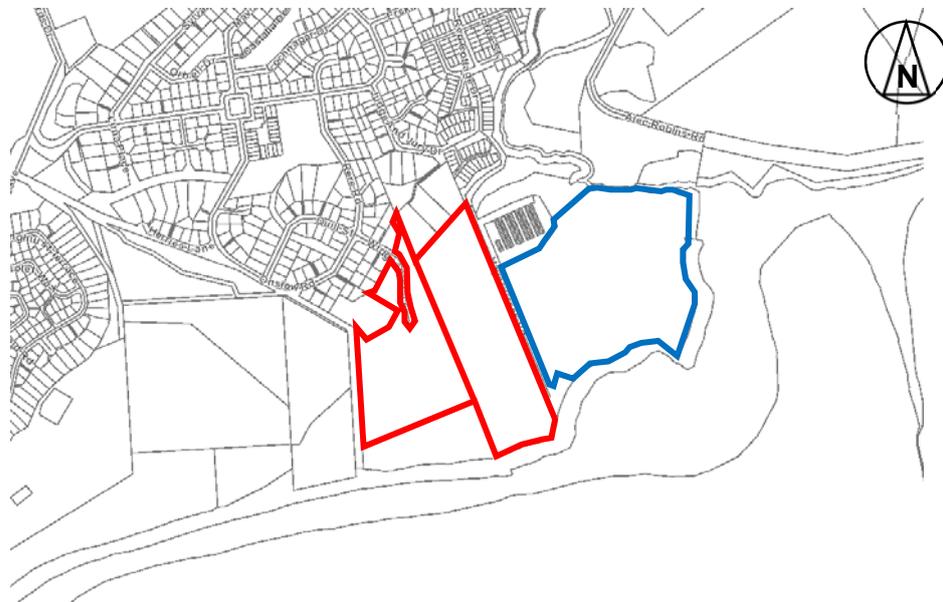


Figure 1: Location of the River Flats (Red: Council-Owned, Blue: Submitter Owned)

3.2 The blue-outlined area, owned by the submitter, is 16.8203 ha in size. The red-outlined areas are owned by the Council, with the central area being

9.8778 ha and the western area being 8.1534 ha. Therefore in total, the submission seeks the rezoning of 34.8812 ha.

- 3.3 I understand that the range of activities that could establish as of right under the requested zoning is broad, with the proposed District Plan setting out that this zone is intended to provide for “*organised sport and events, usually with associated buildings and structures*”, “*indoor and outdoor organised sports, active recreation and community activities*”, and “*organised sport and recreation with toilets, changing facilities, car parking and turf or playing surfaces formally maintained to an appropriate standard for the relevant sports code. These include sports fields, hard-court areas, club facilities as well as associated infrastructure such as car parking and changing rooms*” (Objective 38.5).
- 3.4 In addition “*commercial activities accessory to sport and active recreation activities, such as those that provide food or beverage services to support recreational use, may be undertaken in appropriate locations within this zone*” (Objective 38.5).
- 3.5 That said, I understand from a report prepared by Fluent Solutions (dated 30 May 2018) that the area is within the Kawarau River flood plan and therefore is occasionally inundated. Paragraph 3.2.1 of the Fluent report suggests an average of one inundation every seven years, and that this could be in the order of up to 2m (paragraph 3.3 of the Fluent report).
- 3.6 In view of this, Dr Galloway suggests that this will mean that the activities likely to establish will require minimal facilities, or which can be removed prior to a flood event occurring (Galloway evidence paragraph 28 and 29).
- 3.7 From a transportation perspective, this is an important aspect because it indicates that there will be a bias towards activities which require a larger area of land as a playing surface, but which do not require large, permanent structures (and if any structures are in place, they are resilient to flooding). Typically, activities which require a large playing surface have a low traffic generation per unit area.
- 3.8 In view of this, I have initially considered a number of different types of activity to identify the likely traffic generation. At the outset though, I note that there is relatively little traffic generation information available for recreational activities and thus the bulk of my analysis has been undertaken from first principles.

- (a) Rugby: With 15 players per side, allowing for 2 players to share a vehicle then prior to a match 15 vehicles would arrive and after a match 15 vehicles would depart.
 - (b) Soccer: With 11 players per side, allowing for 2 players to share a vehicle then prior to a match 11 vehicles would arrive and after a match 11 vehicles would depart.
 - (c) Cricket: With 11 players per side, allowing for 2 players to share a vehicle then prior to a match 11 vehicles would arrive and after a match 11 vehicles would depart.
- 3.9 It would not be unreasonable in my view to make an allowance for a similar number of vehicles for officials and spectators, as for players.
- 3.10 Allowing for each pitch to be separated from adjacent pitches by at least 20m, this equates to a traffic generation rate of 0.09 to 0.24 vehicle movements per 100sqm of playing area (depending on the sport under consideration)¹. These rates double in the event that one match starts immediately after another, since the second set of players arrive followed shortly afterwards by the first set of players departing.
- 3.11 In addition, areas will be needed for car parking (as is common to every type of development). Allowing for a car parking space to occupy 25sqm (which allows for the space itself plus the aisle), and the number of players and vehicles (set out above), then an additional 2.3% to 6.0% of the equivalent area to the pitch is required for car parking. These increase to 4.6% to 12.0% in the event that one match starts immediately after another.
- 3.12 There are a number of other sporting activities which could occur at the site, such as athletics, golf or equestrian events, and I note Dr Galloway also mentions water-based activities such as river boarding, multisport boating, and a slalom kayak course (Galloway paragraph 52), and a BMX / mountain bike course. Generally however, the number of participants per unit area for these is much lower than the ball sports noted above and thus any consequential traffic generation (per unit area) will also be lower.
- 3.13 One further matter to consider is the timing of matches. In the first instance, one issue which can arise is the extent to which matches start and finish at

¹ Rugby pitches are 1.26 ha, soccer pitches are 1.1 ha and cricket pitches are 2.4 ha (taking into account that the oval shape would need to be 'squared off'). All figures include a separation distance from other pitches.

the same time as one another. If several matches start and end simultaneously, there will be short periods of higher traffic flows on the road network compared to a scenario of matches starting and finishing at different times, when the traffic loadings are spread over a longer time period.

- 3.14 In addition, most sporting activities occur outside the busiest periods on the road network (that is, the weekday morning and evening 'commuter' periods) but where a facility is used by children, there can be times when they coincide. One example of this is the soccer practice which occurs at the Events Centre during the weekday evening peak hour.
- 3.15 Where possible and practical, I have allowed for these with my analysis.
- 3.16 I have also been mindful of Dr Galloway's comments that the River Flats would be intended to serve Bridesdale Farm, Lake Hayes Estate and Shotover Country (Galloway Table 1). In that regard, I have allowed for the generated traffic to be contained within the built-up area on the southern side of State Highway 6, rather than the activities generating vehicles which need to use the highway.

4. Assessment of Adjacent Transportation Environment

- 4.1 There are two transportation linkages to the site, one via Widgeon Place towards the northwest and one via Hayes Creek Road, which connects to the centre of the site on the northern side.
- 4.2 Widgeon Place is presently a cul-de-sac, and rises from south to north with a 1 in 15 gradient. The carriageway width is 6.7m (kerbface to kerbface). It is presently very lightly trafficked, serving only ten residential properties, which are located towards its northern end.
- 4.3 At the northern end, Widgeon Place meets Onslow Road, Rere Road and Quill Road at a small roundabout. Rere Road forms the northernmost approach, and this links to Hope Avenue (the main route through Lake Hayes Estate) approximately 370m further north. Rere Road has a carriageway width of 8.6m, with parking permitted on both sides.
- 4.4 Onslow Road forms the southern approach, but this subsequently curves towards the north and forms the southern approach to the Nerin Square gyratory system. This road has a carriageway width of 6.7m.

- 4.5 Quill Road is a small road which serves approximately 25 residences, and which subsequently joins Onslow Road towards the west.
- 4.6 In turn, from Nerin Square, Hope Avenue provides a link into the eastern parts of the Lake Hayes Estate subdivision, with Howards Drive providing a connection to the Shotover Country subdivision further to the west, via Jones Avenue. As the main access into the subdivision, Howards Drive has two 5m wide traffic lanes separated by a raised median, meaning the road has a relatively high capacity.
- 4.7 With regard to Hayes Creek Road, this road is presently unmetalled over its southern parts but further north has been formed as a 5.5m carriageway with kerb and channel. The road rises from south to north, and connects to Red Cottage Drive, which is the main spine road within the Bridesdale Farm subdivision. In turn Red Cottage Drive joins Erskine Street and Hope Avenue.
- 4.8 The pedestrian network in the area is well-developed. There is a 1.4m footpath on the western side on Widgeon Place, with similar provision on the western side of Rere Road, the northern/eastern side of Onslow Road and the southern side of Hayes Creek Road. There are also footpaths on each side of Howards Drive and Hope Avenue.
- 4.9 Although there is no infrastructure provided for cyclists in the immediate area of the site, there is a small network of routes provided where Jones Road meets Howards Drive (towards the west). These have been installed as part of providing a safe route to Shotover Primary School, with off-road routes provided at Blackbird Hill.
- 4.10 There is a bus stop on Onslow Road, some 60m south of Widgeon Place, which is used by Service 4 (Lake Hayes Estate to Frankton Hub) which runs with an hourly frequency (and 30 minutes in the morning peak hours).
- 4.11 The low traffic volumes in the area coupled with the recency of the development generally mean that little formal traffic flow information is available for the roads noted above. Taking into account the extent of residential development served, I anticipate that Widgeon Place will have daily volumes in the order of 70 vehicle movements (two-way) and 7 vehicle movements (two-way) at peak times. Similarly, Onslow Road and Rere Road will have low volumes at their southern ends, but this will rise to around 500 vehicle movements (two-way) and 50 vehicle movements (two-way) at peak times on both, although the volumes on Onslow Road will be affected by the presence of The Hayes café and local dairy.

- 4.12 As the main road through the subdivision, Howards Drive will carry greater traffic volumes. Surveys undertaken in 2016 showed a peak hour traffic volume in the order of 500 vehicles (two-way) at its western end, which indicates a daily volume of around 5,000 vehicles (two-way).
- 4.13 Red Cottage Drive has only recently been constructed and the Bridesdale Farm subdivision is presently not fully built-out. However with around 100 lots located towards the north of the site, I anticipate a peak hour traffic volume of around 70 vehicles (two-way) and a daily volume of 700 vehicles (two-way). Hayes Creek Road presently has minimal traffic flows.
- 4.14 With regard to these traffic flows, Figure 6.1 of the NZTA 'Cycle Network and Route Planning Guide' sets out that it is largely appropriate for cyclists to share the road with motorised vehicles, other than towards the western end of Howards Drive where some form of separation is appropriate (as has been provided).

5. Effects of the Requested Rezoning on the Transportation Environment

- 5.1 Under the Council's Subdivision Code of Practice, a carriageway width of 5.5m to 5.7m is suitable for accommodating a traffic flow of around 2,000 vehicles per day. Since the peak hour volume on an urban road is around 10% of the daily flow, this means that a peak hour volume of 200 vehicles (two-way) is anticipated. On the same basis, a carriageway width of 8.4m will typically carry peak hour volumes of 800 vehicles (two-way), being 10% of the expected typical daily volume of 8,000 vehicles (two-way).
- 5.2 The traffic flows on the roads adjacent to the site currently have traffic volumes that are much lower than this, plus slightly wider carriageways, and are therefore capable of accommodating additional traffic without exceeding the expectations of the Code of Practice.
- 5.3 As I noted above, the traffic increase depends on factors such as the type of activity, whether the start and finish times of activities coincide, and whether the activities occur at the peak times on the road network.
- 5.4 In addition, the routing of vehicles is important because there are two potential access routes (Widgeon Place and Red Cottage Drive). In my view, it is reasonable to expect that vehicles heading towards Shotover Country and western parts of Lake Hayes Estate will use the former, with the latter being

used by those travelling to/from the eastern parts of Lake Hayes Estate and Bridesdale Farm.

- 5.5 In the first instance, I have evaluated a worst case scenario of the various activities coinciding. To do this, I have firstly found the available capacity on each road, and then calculated how much area within the site would give rise to this traffic volume. This has been based on the calculated rates of 0.09 to 0.24 vehicle movements per 100sqm of playing area (depending on the sport under consideration), but taking into account that the next players could arrive very shortly after the first players depart (that is, the trip rates are doubled).
- 5.6 Once the extent of the activity has been found, I have then allowed an area for the associated car parking.

Road	Traffic Flows (Two-Way)		Development (ha)		
	Existing Peak Hour	Available Capacity	Activity	Parking	Total
Widgeon Place	7	193	4.1-10.5	0.5	4.5-11.0
Onslow Road	50	150	3.2-8.2	0.4	3.5-8.6
Rere Road	50	150	3.2-8.2	0.4	3.5-8.6
Howards Drive	500	300	6.3-16.4	0.8	7.1-17.1
Red Cottage Dr	70	130	2.7-7.1	0.3	3.0-7.4

Table 1: Extent of Development Possible, Participants Arriving/Departing at Same Time

- 5.7 Allowing for the two points of access to the site, in my view this shows that 7.5 to 18.4 ha of the site² could be developed without giving rise to traffic flows on the road that are greater than expected by the Code of Practice.
- 5.8 In the event that the start and end of games/matches did not coincide, and thus participants were spread over a longer time period then the lower rates of 0.09 to 0.24 vehicle movements per 100sqm of playing area would apply, meaning that there could be a greater amount of activity. At the same time though, the amount of parking required reduces (as there are fewer

² 4.5 ha to 11.0 ha served by Widgeon Place plus 3.0 ha to 7.4 ha served by Red Cottage Drive

participants present at any time). This would give rise to the following amounts of development:

Road	Traffic Flows (Two-Way)		Extent of Activities (ha)
	Existing Peak Hour	Available Capacity	
Widgeon Place	7	193	8.3 to 21.3
Onslow Road	50	150	6.5 to 16.6
Rere Road	50	150	6.5 to 16.6
Howards Drive	500	300	13.0 to 33.1
Red Cottage Drive	70	130	5.5 to 14.2

Table 2: Extent of Development Possible, Participants Arriving/Departing at Different Times

- 5.9 Again making an allowance for the two access roads, in my view this shows that 13.8 to 35.5 ha of the site³ could be developed without giving rise to traffic flows on the road that are greater than expected by the Code of Practice.
- 5.10 These calculations do not take account of participants travelling by non-car modes of transport. In this regard, travel surveys show that the typical maximum walking distance is in the order of 1km with cyclists travelling up to 3km. These distances are shown below.

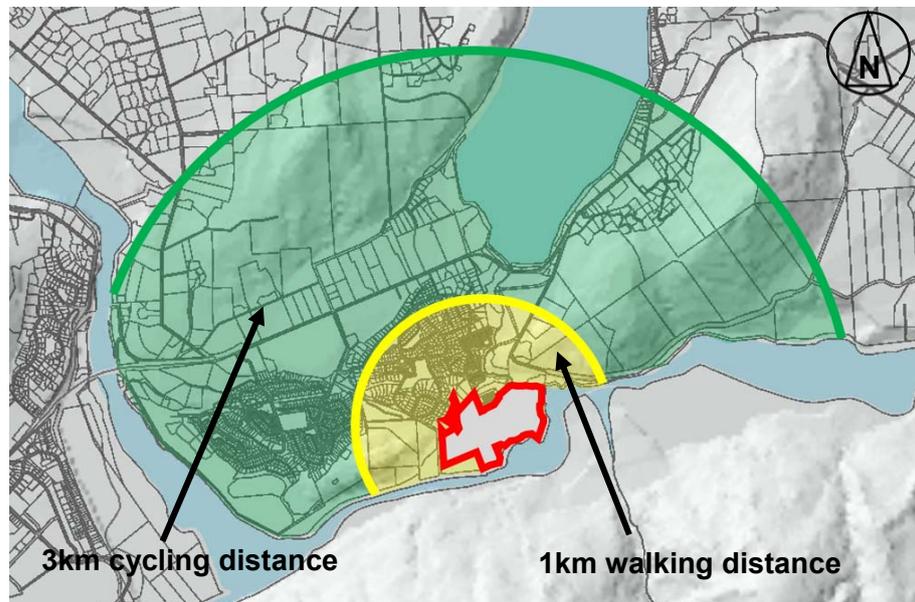


Figure 2: 1km Walking Distance and 3km Cycling Distance

³ 8.3 ha to 21.3 ha served by Widgeon Place plus 5.5 ha to 14.2 ha served by Red Cottage Drive

- 5.11 It can be seen that all of Bridesdale Farm, the majority of Lake Hayes Estate, plus the eastern parts of Shotover Country are all within a viable walking distance of the site. All of these three subdivisions, plus also additional areas beyond, lie within a 3km cycling distance of the site.
- 5.12 In this regard, the footpaths on the adjacent roads adequately provide for walking trips and although there is no specific cycling infrastructure in the immediate area, the traffic volumes on the road remain relatively low meaning that it continues to be appropriate for cyclists to share the carriageway with motorised traffic
- 5.13 As I noted previously, there is a bus stop on Onslow Place. This is 340m from the southern end of Widgeon Place (and thus from the site boundary).
- 5.14 On this basis, I consider that the site has good accessibility by walking, cycling and public transport and that consequently, there is a high potential for non-car travel to/from the site.
- 5.15 I consider that there is further conservatism in the calculations because:
- (a) They assume that vehicles travel at the same time as the peak periods on the adjacent road network. At non-peak times, which includes weekends, there will be greater capacity for the network to absorb additional vehicle movements and hence more development could occur;
 - (b) They do not take account of organised activities that have a lower traffic generation, such as equestrian events or athletics, but rather are biased towards higher traffic-generating activities;
 - (c) They do not take account of greater separation between the playing areas but rather, assume that the areas are close together;
 - (d) They do not take account of activities which occur informally, such as a BMX / mountain bike course, which have a lower traffic generation in the peak hours.
- 5.16 Overall then, in my view, the roading network is able to accommodate the traffic flows likely to arise from the rezoning of the land for Active Sport and Recreation.

6. Review of Officers' Reports

- 6.1 I have reviewed the Statement of Evidence of Ms Galavazi and the s42a report of Ms Edgley.
- 6.2 Ms Galavazi sets out that in her view, the site does "*not have appropriate access*" (Galavazi paragraph 9.17). However no further information is provided as to why she considers that access is not appropriate. In contrast, my calculations set out above show that the roading network has sufficient capacity to accommodate the likely traffic flows and the site is accessible by walking and cycling.
- 6.3 Ms Edgley recommends that the submission is rejected, and in so doing relies upon Ms Galavazi's evidence (Edgley paragraph 34.1). She also does not provide further details with regard to the matter of access.

7. Conclusions

- 7.1 Based on my review, I consider that the transportation networks in the vicinity of the submission site have sufficient capacity to absorb the increased travel demand arising in the event that the land was to be rezoned as Active Sport and Recreation.
- 7.2 Accordingly, I am able to support the submission from a transportation perspective.

Andy Carr

Carriageway Consulting Ltd

6 August 2018