

Before Queenstown Lakes District Council

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In the matter of            The Resource Management Act 1991

And                            The Queenstown Lakes District proposed District Plan Topic 13  
Queenstown Mapping

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**STATEMENT OF EVIDENCE OF ANDY CARR FOR**

Gertrude's Saddlery Limited (494)

Larchmont Developments Limited (527) and (1281)

Dated 9 August 2017

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**Solicitors**

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**anderson  
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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 am a member of the national committee of the Resource Management Law Association and a past Chair of the Canterbury branch of the organisation. I am also a Member of the Institution of Professional Engineers New Zealand, and an Associate Member of the New Zealand Planning Institute.
- 4 I have more than 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.
- 5 I am presently a director of Carriageway Consulting Ltd, a specialist traffic engineering and transport planning consultancy which I founded in early 2014. My role primarily involves undertaking and reviewing traffic analyses for both resource consent applications and proposed plan changes for a variety of different development types, for both local authorities and private organisations. I am also a Hearings Commissioner and have acted in that role for Greater Wellington Regional Council, Ashburton District Council, Waimakariri District Council and Christchurch City Council.
- 6 Prior to forming Carriageway Consulting Ltd I was employed by traffic engineering consultancies where I had senior roles in developing the business, undertaking technical work and supervising project teams primarily within the South Island.
- 7 I have carried out numerous commissions which have involved assessing the traffic and transportation effects of residential developments such as that which would be facilitated by the proposed rezoning. Within the Queenstown Lakes district, these have included the residences facilitated by Plan Changes 4 (North Three Parks, 600 residences), 25 (Kingston, 750 residences), 39 (Arrowtown South, 215 residences), and 41 (Shotover Country, 770 residences). Smaller commissions have included assessments of The Heights in Wanaka (133 residences), West Meadows in Wanaka (42 residential units), The Hills in Arrowtown (17 units), and Alta Apartments in Queenstown (11 units).

- 8 Further afield, my experience includes Stonebrook (460 sections in Rolleston), Perriam Cove (Cromwell, 48 units), Awatea (Christchurch, 139 residences) and numerous others.
- 9 As a result of my experience, I consider that I am fully familiar with the particular traffic-related issues associated with the residential developments of the size contemplated.
- 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. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

### **SCOPE OF EVIDENCE**

- 11 In this matter I have been asked by Counsel for the submitters, Gertrude's Saddlery Limited (#494) and Larchmont Developments Limited (#527) and (#1281) to undertake a peer review of the Statement of Evidence produced by Mr Jason Bartlett.
- 12 My review has been carried out in accordance with the Institution of Professional Engineers (NZ) Practice Note 2 'Peer Review'. In this context, and as expected under the Practice Note, I have spoken with Mr Bartlett to ensure that I have fully understood the background to his assessments.
- 13 For ease of reading, I have structured my evidence using the same section headings as Mr Bartlett.
- 14 As part of reviewing Mr Bartlett's evidence, I have also read the Evidence in Chief and Rebuttal Evidence of Ms Wendy Banks. In brief, Ms Banks supports the Gertrude's Saddlery Limited submission but opposes the Larchmont submission due to the higher traffic generation and consequential effects on the adjacent Atley Road / Mathias Terrace and Arthurs Point Road / Atley Road intersections and the single-lane Edith Cavell Bridge, and due to the constraints of the internal access to the submitters' sites from Atley Road.

### **BARTLETT SECTION 'SUBMISSIONS'**

- 15 Although this section largely describes the nature of the submissions, it sets out that the peak traffic generation that could arise as a result of the submissions is 116 vehicles per hour for Larchmont (based on 89 residential lots) and 47 vehicles per hour for Swan (based on 36 residential lots)<sup>1</sup>. In turn, these figures

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<sup>1</sup> Bartlett Evidence in Chief paragraphs 12 and 13

are extracted from the Evidence in Chief of Ms Wendy Banks for Queenstown Lakes District Council<sup>2</sup>.

- 16 This traffic generation equates to 1.3 vehicle movements per residence in the peak hours<sup>3</sup>. By way of comparison, the New Zealand Transport Agency (“NZTA”) Research Report 453 (*Trips and Parking Related to Land Use*) sets out that based on a small data set of five subdivisions, a rate of 0.9 to 1.4 vehicle movements (two-way) could be expected in the peak hours. I therefore consider that the rate used is robust but that in practice, the traffic volume may be lower than calculated.
- 17 Mr Bartlett also sets out that it is appropriate to assess a scenario of 10 years hence when considering the rezoning of land<sup>4</sup>. I confirm that this is the case, noting that this advice is also set out in NZTA Research Report 422 (*Integrated Transport Assessment Guidelines*)<sup>5</sup>.

## **BARTLETT SECTION ‘TRANSPORT ENVIRONMENT AND ASSESSMENT’**

### **Edith Cavell Bridge**

- 18 Mr Bartlett discusses in some detail the performance of the Edith Cavell Bridge based on outputs from the Queenstown Traffic Model and his own observations carried out at the peak hours on 1 June 2017. His observations suggested that in the morning peak hour, low queues and delays were observed but in the evening peak hour a peak hour flow of 1,300 vehicles per hour with up to 13 vehicles queuing on each side of the bridge. Conversely, the model assumes a peak hour flow of 590 vehicles per hour. Mr Bartlett concludes that the bridge is operating over its theoretical capacity during the evening peak hour<sup>6</sup>.
- 19 Ms Banks highlights that the traffic survey was taken during a shoulder season and that traffic flows will be significantly greater during peak tourist season such as in the ski season and therefore that the effects of the proposal will be more significant than has been calculated<sup>7</sup>.
- 20 I understand Mr Bartlett has carried out an additional traffic surveys in late July, during the ski season. These surveys showed a lower traffic volume than previously recorded but a greater proportion of coaches within the traffic stream.
- 21 I agree with Ms Banks that the shoulder season traffic flows are typically lower than the peak tourist seasons, but in some respects, this is rather a ‘red herring’

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<sup>2</sup> Banks Evidence in Chief paragraph 8.119

<sup>3</sup> Banks Evidence in Chief paragraph 8.122

<sup>4</sup> Bartlett Evidence in Chief paragraph 13

<sup>5</sup> NZTA Research Report 422 Section 5.5

<sup>6</sup> Bartlett Evidence in Chief paragraph 18

<sup>7</sup> Banks Rebuttal Evidence paragraph 5.11

because even using the shoulder season flows, Mr Bartlett has concluded that the bridge is operating beyond its theoretical capacity. If the prevailing traffic flows were higher, as Ms Banks suggest, then this conclusion would remain true.

- 22 Consequently I consider that the main issue is whether the bridge has the capacity to absorb additional traffic and if so, whether the volume of traffic generated by the development of the submitters' sites is within this threshold.
- 23 Mr Bartlett sets out that the Kawarau Falls Bridge was signalised when peak hour flows reached 540 vehicles (two-way) and that this bridge is 210m long<sup>8</sup>. The Edith Cavell Bridge is 140m long, and so as a rough rule of thumb, I consider that the potential for vehicles to meet on the Edith Cavell Bridge is two thirds that of the Kawarau Falls Bridge (as it is two thirds the length). This therefore means that it can accommodate more traffic before being signalised. Allowing for the difference in bridge length, this indicates that the Edith Cavell Bridge will justify traffic signals when peak hour flows are around 800 vehicles (two-way).
- 24 Mr Bartlett has reported peak hour traffic flows on the bridge of 770 to 1,300 vehicles per hour, indicating a wide variation in observed volumes. Ms Banks considers that at least some of these volumes may be too low compared to the traffic flows carried in the peak tourist season. On this basis then, I consider that the threshold at which the bridge requires signalling has already been reached.
- 25 I therefore agree with Mr Bartlett's conclusions that the "*bridge is already operating beyond its ideal operational efficiency, and certainly beyond the level of service which triggered the installation of the District's first traffic signals at the Kawarau Falls Bridge*"<sup>9</sup>.
- 26 Accordingly, I also agree that the need for the upgrade is not dependent on, or triggered by, any development of the submitters' land.

#### **Arthurs Point Road / Atley Road Intersection**

- 27 Mr Bartlett reports that his observations show that only minimal queuing is presently seen at this intersection and that the existing configuration has the capacity to accommodate the increased traffic flows<sup>10</sup>. Ms Banks raises concerns about the extent of traffic that could be generated by the rezoning of the land but does not quantify this<sup>11</sup>.
- 28 The volume of traffic generated by the proposed rezoning equates to one additional vehicle movement every 30 seconds in the peak hours. Most of this

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<sup>8</sup> Bartlett Evidence in Chief paragraph 20

<sup>9</sup> Bartlett Evidence in Chief paragraph 20

<sup>10</sup> Bartlett Evidence in Chief paragraph 27

<sup>11</sup> Banks Evidence in Chief paragraph 8.123

traffic would turn left out of Atley Road in the morning peak hour<sup>12</sup> and turn right into Atley Road in the evening peak hour.

- 29 In my experience, it is the right-turn movement out of the minor approach to an intersection which experiences the greatest delays, and in this instance, this movement is in the minority. Further, an increase of 1 vehicle movement every 30 seconds typically has negligible effect on queues and delays unless an intersection is already heavily congested. Mr Bartlett's comments show that this is not the case.
- 30 I note that there is already an right-turn auxiliary lane at the intersection, meaning that vehicles turning into Atley Road do not obstruct eastbound through traffic on Arthurs Point Road.
- 31 Overall then, I do not expect that the additional traffic generated by full development of the submitters' sites will result in significant levels of queuing or large delays at this intersection.

#### **Access from Atley Road**

- 32 My assessment below is based on the assumption that the internal access from Atley Road may be required to serve up to 121 residential units, comprising a maximum of 89 units in the submitters' sites, plus 15 units under the existing Low Density Residential zoning, plus 17 existing houses.
- 33 From my site visit, at present the proposed access road into the development is unsealed and formed as a single traffic lane with restricted forward visibility. This would not be sufficient to safety or efficiently accommodate the traffic generated by development of the submitters' sites.
- 34 Mr Bartlett notes that agreement has been reached with owners of an adjacent allotment to increase the width of the legal road reserve to 9.5m, which will facilitate a carriageway width of 5.5m to 5.7m and a single footpath of 1.4m width to serve the proposed rezoned area<sup>13</sup>. Ms Banks has concerns that this level of provision will be insufficient, highlighting that there will be "*limited sight visibility and reduced pedestrian/cyclists provisions*"<sup>14</sup>.
- 35 The Council's Land Development and Subdivision Code of Practice sets out that for a suburban road serving up to 200 residences, the following provision is required:

- i. 15m wide legal road width;

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<sup>12</sup> Banks Evidence in Chief paragraph 8.119

<sup>13</sup> Bartlett Evidence in Chief paragraph 31

<sup>14</sup> Banks Rebuttal Evidence paragraph 5.15

- ii. 1.5m footpath on each side, where there are more than 20 residences;
- iii. No specific provision for cyclists;
- iv. 5.5m to 5.7m carriageway width; and
- v. Parking within the movement lane for less than 100 residences, but separate parking lane required where there are more than 100 residences.

- 36 In this instance, the proposed carriageway width is 5.5m to 5.7m, which meets the Subdivision Code. No specific provision is proposed for cyclists which is again in accordance with the Subdivision Code.
- 37 Ms Banks highlights that carriageway widths of 5.5m to 5.7m are better suited for shorter roads of up to approximately 250m, to assist with achieving a slower operating speed<sup>15</sup>. Although I acknowledge that this is a comment included within the Subdivision Code, to my knowledge many of the recent subdivisions in the District provide carriageways of this width on all roads (for example, Shotover Country and Northlake) to support a slow speed environment and support road safety. In my view, this carriageway width would be appropriate in this location for similar reasons.
- 38 Therefore I consider that the primary issues relate to the legal road width, the parking lane and the reduced level of provision for pedestrians.
- 39 With regard to the legal width, 15m is provided over the majority of the road length, other than over a length of around 80m where it tapers to between 9.5m and 14m. The Subdivision Code sets out that the legal width is to be selected to ensure that the road formation is adequate, sufficient width is available for utility services, and that the width can accommodate long-term community needs.
- 40 A 9.5m legal width, minus 1.4m for a footpath and 5.7m for a carriageway means that 2.4m is available for utilities. In my view, this will be adequate. However the reduced legal width means that the carriageway could not be widened and so the amount of development will be limited to 200 residences (unless Council agrees in future to accept a relaxation from the Subdivision Code). However the extent of development currently sought under the current submissions is less than this.
- 41 A parking lane is described within the Subdivision Code where more than 100 residences are served. However in this case, the extent to which this threshold is exceeded is small, and thus the extent of on-street parking will be very limited. I agree with Ms Banks that it is important that the passage of emergency vehicles

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<sup>15</sup> Banks Rebuttal Statement paragraph 5.13

is not inhibited by on-street parking, but this can be addressed through restricting parking on one, or both, sides of the road.

- 42 With regard to the provision for pedestrians, I note that the none of the roads within Arthurs Point, including Arthurs Point Road, have more than one footpath. I therefore do not consider that the provision of one footpath on the extended Atley Road would be out-of-keeping with the remainder of the roading network, and so I do not agree with Ms Banks' concerns in this regard. However, a width of 1.4m is less than set out in the NZTA Pedestrian Planning and Design Guide where 1.5m is recommended, and 1.5m is the minimum width included in the Council's Subdivision Code also. I therefore do not agree with Mr Bartlett that 1.4m is a suitable width, but I also note that it would appear possible to provide 1.5m instead.
- 43 Ms Banks raises the issue of sight distances at the curve in the access road, and highlights that this may present a road safety concern. However Mr Bartlett does not discuss this matter.
- 44 Based on my site visit and aerial photographs, at present the available sight distance at the curve is around 25m, and is restricted by the topography on the inside of the curve. In the event that two vehicles were heading towards one another at the curve, they would only be able to stop in time to avoid a collision if they were travelling at 15km/h or less. The curve radius will to some extent slow vehicle speeds but based on the radius I consider that speeds of around 30km/h will occur. This would present a road safety hazard under the existing road layout.
- 45 However it is proposed to widen the carriageway to 5.5m to 5.7m, and this is sufficient to provide two traffic lanes. Consequently, vehicles will not be travelling directly towards one another and therefore will not be on trajectories that will cause them to meet. Moreover, the traffic flows in this location will be tidal (most vehicles will exit the submitters' sites in the morning and enter in the evening), therefore reducing the potential for one vehicle to encounter another travelling in the opposite direction. Even using Ms Banks' robust assessment of the traffic generation, there will be at most one vehicle movement every 30 seconds in the peak hours and this low value further reduces the potential for vehicles to meet.
- 46 That said, drivers oftentimes 'cut the corner' on curves and as noted above, if two vehicles were to meet then I consider that there would be an adverse safety effect. I consider that this can be addressed through carriageway markings and road signs (such as yellow 'no overtaking' centrelines, PW43.1 'road narrows' signs, and/or speed advisory signs) to ensure that drivers stay on their own side of the road.



47 On this basis, I concur with Mr Bartlett's views that the proposed access road will be suitable to serve the extent of development contemplated in the submitters' sites.

**SUMMARY**

48 On the basis of my peer review, I concur with the evidence of Mr Bartlett with regard to his assessment of the transportation effects of the rezoning sought by the submitters, with the exception of the footpath width which I consider should be widened slightly to 1.5m.

Andy Carr

9 August 2017