

**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 Hearing Stream 13 – Queenstown Mapping

**AND**

**IN THE MATTER** Submissions 494 (Michael Swan) and 527 (Larchmont  
Developments Limited)

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**STATEMENT OF EVIDENCE OF JASON BARTLETT  
9 June 2017**

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## **INTRODUCTION**

### **Qualifications and experience**

- 1 My name is Jason Bartlett. I am an experienced traffic and transportation engineer. My academic and professional qualifications are:
  - (a) New Zealand Certificate in Engineering, Civil Option obtained in 1993;
  - (b) Bachelor of Engineering (BE) from the University of Canterbury awarded in 1996;
  - (c) Graduate Member of the Institution of Professional Engineers of New Zealand (G.IPENZ), since 1995; and
  - (d) Chartered Engineer and Member of the Institution of Civil Engineers (CEng MICE), since 2007.
- 2 I have over twenty years' experience in road design, network management, traffic and transportation engineering including nine years in the UK. During my time in the UK I became a Chartered Engineer and a Member of the Institution of Civil Engineers.
- 3 Since April 2008 I have been working as a traffic and transportation engineer in Queenstown. The first four of these years was for GHD Limited. I now operate my own traffic engineering consultancy, Bartlett Consulting, which I established in July 2012.

### **Expert witness code of conduct**

- 4 I have been provided with a copy of the Code of Conduct for Expert Witnesses contained in the Environment Court's Consolidated Practice Note dated 1 December 2014. While this matter is not before the Environment Court, I have read and agree to comply with that Code. This evidence is within my area of expertise, except where I state that I am relying upon the specified evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

### **Involvement in project**

- 5 In this matter I was originally engaged by Larchmont Developments Limited to provide engineering advice relating to a Resource Consent

for a subdivision under RM130588. This subdivision shared the access to land associated with Submissions 494 (Michael Swan) and 527 (Larchmont Developments Limited).

- 6 Subsequently I have been engaged by Gertrudes Saddlery Limited, the current owners of 111 Atley Road which is land associated with Submissions 494 & 527.
- 7 In preparing this evidence I have reviewed the following documents or reports relevant to my area of expertise:
  - (a) The Transport Evidence of Ms Wendy Banks, Section 8.118 to 8.123; and
  - (b) QLDC Section 42A Report/Evidence of Ms Rosalind Devlin, Sections 48 & 49.
- 8 I have prepared my evidence based on my:
  - (a) Expertise as a traffic and transport engineer;
  - (b) Familiarity with the application site and surrounding area including a review of the existing (local) traffic conditions near the site and future year traffic modelling undertaken within the vicinity of the site; and
  - (c) Familiarity with the above mentioned documents.

### **Scope of evidence**

- 9 My evidence addresses the following matters:
  - (a) Overview of the traffic related elements of the Submissions in relation to the current and future transport networks at Arthurs Point; and
  - (b) Response to Transport Evidence.

### **SUBMISSIONS**

- 10 The Submissions (494 & 527) include a similar area of land, the Swan Submission (494) includes a smaller portion of the land included in the Larchmont Submission (527).
- 11 The Submissions both request that an area of Rural General is rezoned as Low Density Residential. The rezoning would enable residential

subdivision. The area will limit the overall effect of development. The Swan Submission (494) extends the Low Density Residential zone boundary to include a greater portion of Lot 1 DP307630. The Larchmont Submission extends the Low Density Residential zone to include the full area of Lot 1 DP307630 and includes Lot 2 DP398656.

- 12 When preparing this evidence I have relied on Council's evidence that the Submissions may allow the future development of up to 36 residential lots (Swan, 494), or up to 89 residential lots (Larchmont Submission 527).
- 13 For assessment the peak traffic generation based on the Submission areas is 116vph for Larchmont (527) which would include 47vph based on Swan (494). It is typical to consider traffic impacts in the design year, a future year generally 10 years <sup>1</sup> following development. For this assessment I have assumed a design year of 2030 taking into account that development will not happen immediately.
- 14 In my evidence I have only considered the potential effects of the larger Larchmont Submission.

#### **TRANSPORT ENVIRONMENT AND ASSESSMSNT**

- 15 I have recently provided traffic engineering advice and transport assessments for a number of nearby projects during the resource consent stage. This has included:
  - (a) RM130588, Larchmont Developments Limited, approved the development of an access road to the area of the proposed zone change;
  - (b) SH160143, Riverton Queenstown Limited, which approved a high density residential development under the Housing Accords and Special Housing Areas Act at 157 Arthurs Point Road; and
  - (c) RM160899 & RM161114, Residence du Parc Limited which approved a residential subdivision and visitor accommodation apartments at 154 Arthurs Point Road.

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<sup>1</sup> Refer Austroads Guide to Traffic Management Part 12: Traffic Impacts of Developments, Commentary 5. Design year should desirably be 10 years after opening. For a large staged development the design year may be in the range of 10 to 20 years after opening.

- 16 I have used my experience with these projects to establish the existing and future transport environment of Arthurs Point Road at Edith Cavell Bridge and at the intersection with Atley Road. I have also observed traffic at these location during the am and pm peak periods on Thursday 1 June 2017.

#### Edith Cavell Bridge

- 17 During traffic observations Edith Cavell Bridge appears to have available capacity during the am peak period when the majority of traffic is traveling towards Queenstown and generally has the right of way. There was minor delay and queuing noted in the opposite direction, toward Arrowtown. This suggests that the Edith Cavell Bridge would have a Level of Service of B during the am peak period. This is based on there being some delay as a result of the bridge control but generally less than 15 second average delay<sup>2</sup>.
- 18 The traffic observation in the pm peak showed considerable queuing on both sides of the bridge. During one 10 minute sample period the minimum queue length was 3 vehicles with the maximum queue length in excess of 13 stationary vehicles on each side of the bridge. During this period the level of service was estimated as either D or E as the average delay as a result of the bridge control would be between 25 and 50 seconds<sup>3</sup>. During the 10 minute sample 220 vehicles crossed the bridge<sup>4</sup> suggesting a peak hourly flow estimated at 1300vph<sup>5</sup>. Traffic guidance would suggest that this is beyond the theoretical capacity of a single lane bridge<sup>6</sup>. For 2016 the Queenstown Traffic Model has a 2016 pm peak hour traffic flow of 590vph<sup>7</sup>. Allowing for normal traffic flow variations it is likely that the Edith Cavell Bridge is operating over its theoretical capacity during the pm peak period.
- 19 It is worth noting that traffic signals were installed on the single-lane Kawarau Falls Bridge (SH6) in 2005 to manage the traffic flows. NZTA has a traffic counter at the bridge, and this showed that in 2005, the

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<sup>2</sup> Based on am traffic observations on 1 June 2017.

<sup>3</sup> Based on pm traffic observations on 1 June 2017 (10 minute survey 17:15 to 17:25).

<sup>4</sup> Based on pm traffic observations on 1 June 2017 (10 minute survey 17:15 to 17:25).

<sup>5</sup> Based on pro rata calculation from a 10 minute traffic observations.

<sup>6</sup> Refer Austroads Guide to Traffic Management Part 3: Traffic Studies and Analysis.

<sup>7</sup> From Queenstown Traffic Model provided by Abley Transportation Consultants Ltd. 2016 pm peak, 399vph northbound and 191vph southbound.

traffic flows on the bridge were 5,400vpd<sup>8</sup>. Typically any road carries 10% of its daily traffic flows in the peak hour, meaning that at the time NZTA considered that traffic lights were required, the peak hour flows were in the order of 540vph. In 2015 Kawarau Falls Bridge carried 7,600vpd or 760vph in the peak hour.

- 20 The two bridges are not directly comparable, because the single lane section of the Kawarau Falls Bridge is 210m long compared to the single lane section of the Edith Cavell Bridge at 140m. This means that the likelihood of a vehicle meeting an oncoming vehicle at the Kawarau Falls Bridge was greater than at the Edith Cavell Bridge. Nevertheless, in view of the current volumes on Edith Cavell Bridge, in my view the bridge is already operating beyond its ideal operational efficiency, and certainly beyond the level of service which trigger the installation of the District's first traffic signals at the Kawarau Falls Bridge.
- 21 The McChesney Bridge has recently been widened to two lanes to manage the traffic flow. This bridge is on the same arterial transport route as Edith Cavell Bridge. As such, it carries a similar volume of traffic, but prior to widening, the length of the single lane section was shorter than at the Edith Cavell Bridge. This means that the potential for one vehicle to meet another was lower, and hence the level of service provided by the McChesney Bridge prior to widening was better than at the Edith Cavell Bridge.
- 22 It is noted that the QLDC 2015-2045 Infrastructure Strategy does include for future works at Edith Cavell Bridge before 2045 including the addition of a cycleway and footpath and earthquake strengthening. The replacement of this bridge is currently beyond the 30 year strategy (refer Table 1).
- 23 Within my Transport Assessment for SH160143 I identified that the 2016 traffic flow on Arthurs Point Road was generally less than 4700vpd<sup>9</sup> and the peak winter (ski season) traffic flow was expected to be generally less than 5700vpd<sup>10</sup>. This assessment was based on

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<sup>8</sup> From NZTA State Highway Traffic Data 2004 – 2008. For counter site at SH6 Kawarau Falls Bridge.

<sup>9</sup> From Bartlett Consulting Transport Assessment for Riverton Queenstown Limited, Arthurs Point SHA, October 2016.

<sup>10</sup> From Bartlett Consulting Transport Assessment for Riverton Queenstown Limited, Arthurs Point SHA, October 2016.

historic QLDC traffic count data. The Queenstown Traffic Model predicted traffic flows at Edith Cavell Bridge during the pm peak period will increase to 729vph 2025<sup>11</sup> and 940vph by 2045<sup>12</sup>. These traffic flow increases are based on the expected growth from zoned development of the Operative QLDC District Plan.

- 24 To efficiently manage the one lane Edith Cavell Bridge capacity improvements will be required. This is evident based on performance during the pm peak period. Based on other bridges in the local area it is likely that traffic signals, as a minimum, will be required in the near future to efficiently manage traffic flows in the pm peak. It is likely that the bridge will need to be upgraded to two lanes by 2028 when the pm peak period traffic flow increases beyond 760vph<sup>13</sup>. This will be regardless of any development facilitated by rezoning through the Proposed QLDC District Plan or Submissions to this Proposed District Plan.
- 25 It is likely that the Edith Cavell Bridge will be replaced with a dual lane bridge over the Shotover River before the design year of the proposed zone change. A dual lane bridge over the Shotover River will accommodate additional traffic generated by existing undeveloped zoned areas plus additional growth in the Wakatipu basin plus the proposed zone change.

#### Atley Road Intersection

- 26 Bartlett Consulting undertook detailed traffic modelling of the access intersection at 157 Arthurs Point Road under SH160143, Riverton Queenstown Limited. The Austroads assessment for this intersection suggested that a left turn lane and right turn bay were required based on traffic flows. Detailed traffic modelling using SIDRA modelling software suggested that these facilities were not required. The traffic modelling suggested that a basic left turn and basic right turn would be sufficient. This included modelling using the future traffic flows predicted in 2045, well beyond the anticipated design year. During this

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<sup>11</sup> From the Queenstown Traffic Model 2025 pm peak hour traffic flow, 485vph northbound and 244vph southbound.

<sup>12</sup> From the Queenstown Traffic Model 2045 pm peak hour traffic flow, 626vph northbound and 314vph southbound.

<sup>13</sup> Based on the predicted 2015 hourly traffic flow prior to the replacement of the single lane bridge at Kawarau Falls.

future year the basic intersection layout resulted in a Level of Service B with a maximum delay of 12 seconds in 2045. I believe that this information is transferable to the intersection of Arthurs Point Road with Atley Road.

- 27 The existing intersection of Arthurs Point Road and Atley Road includes a basic left turn and a right turn bay. The operation of this intersection was observed during the am and pm peak periods on Thursday 1 June 2017. During these periods only minimal queuing and delay was identified suggesting that the existing intersection layout is appropriate and has available capacity to accommodate future traffic growth.
- 28 Based on the modelling undertaken for 154 Arthurs Point Road (SH160143) I predict that this existing intersection layout (basic left turn and right turn bay) will be sufficient to accommodate future traffic flows including the proposed zone change. Based on the modelling undertaken for the future 2045 year the extent of queuing and delays are expected to be minimal and acceptable.

#### Mathias Terrace Intersection

- 29 The Mathias Terrace intersection with Atley Road is a formed low volume T-intersection with each approach serving less than 50 existing residential lots. As a basic T-intersection, basic left turn and basic right turn, this intersection type is capable of serving a significantly greater traffic flow than existing.
- 30 I expect that this intersection will have sufficient capacity to accommodate the additional traffic flow as a result of the proposed zone change. It may be that the additional traffic will change the major traffic flow through the intersection. The formed T-intersection layout of this intersection will accommodate this change.

#### Access, from Atley Road

- 31 The area of the zone change is currently accessed only by a Right of Way over Lots 1 & 2 DP307630 which at its narrowest is only 6m wide. I understand that the current owner of Lots 1 & 2 DP307630, Gertrudes Saddlery Limited, has reached agreement with the owners of Lot 2 DP 337696 (85E Atley Road) to increase the legal width restriction. The legal width at the narrowest point is to be increased to 9.5m and will



allow for the construction of a minimum width carriageway (5.5m to 5.7m) and single footpath (1.4m minimum) to access the proposed zone change area.

- 32 It is possible that this access would be formed as an extension of the existing Atley Road. This access would be formed as a Figure E12<sup>14</sup> type road with the exception of the short length of reduced minimum road width. This road type can support a development of up to 200 residential dwellings,<sup>15</sup> and will therefore be appropriate to serve the proposed zone change.

### **TRANSPORT EVIDENCE – Ms Wendy Banks**

- 33 I have reviewed the portion of Ms Wendy Banks' Transport Evidence that relates to the Submissions. Ms Banks does not oppose the Swan Submission (494) based on the low volume of traffic it could potentially generate. Ms Banks does oppose the additional area of zone change requested by the Larchmont Submission (527) because this additional area would generate traffic which could impact on<sup>16</sup>:

- (a) Intersection of Mathias Terrace with Atley Road;
- (b) Intersection of Atley Road with Arthurs Point Road; and
- (c) The one-way bridge over the Shotover River (Edith Cavell Bridge).

- 34 I accept that any development will introduce additional traffic to the local road network. For simplicity I have accepted the basis of the traffic generation within Ms Banks evidence.

- 35 Based on the work that I have undertaken for other projects in this area I believed that this additional traffic, as a result of both Submissions, can be accommodated in the existing intersection layouts. With a design year of 2030 I believe that any effects on the operational capacity of these intersections will be acceptable.

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<sup>14</sup> Based on QLDC Land Development and Subdivision Code of Practice.

<sup>15</sup> The existing extension of Atley Road and existing Right of Way includes 25 residential lots.

<sup>16</sup> The Transport Evidence of Ms Wendy Banks quotes Section 7.118 – it is assumed that this should 8.119.

- 36 I accept that increasing delays at the Edith Cavell Bridge are of concern. The assessment that I have undertaken shows that it is likely that a dual lane bridge over the Shotover River will be required prior to 2030 regardless of this proposed zone change. A dual lane bridge will accommodate additional traffic generated by the proposed zone change.

### **CONCLUSION**

- 37 Submissions to the Proposed QLDC District Plan by Michael Swan (494) and Larchmont Developments Limited (527) have requested that an area of land is rezoned as Low Density Residential. This zone change could create up to 89 residential lots based on the larger Larchmont Submission.
- 38 The assessment that I have undertaken suggests that traffic, as a result of the proposed zone change, can be accommodated within the local road network. This includes an assessment of intersections near to the site and the nearby Edith Cavell Bridge.

**Jason Bartlett**

**9 June 2017**