

**BEFORE THE COMMISSIONERS APPOINTED BY THE CENTRAL OTAGO
DISTRICT COUNCIL**

UNDER the Resource Management Act 1991

IN THE MATTER of RC230179 an application for a 33-lot
subdivision at Rocky Point on Tarras-
Cromwell Road (SH8)

BY **TKO PROPERTIES LIMITED**

Applicant

STATEMENT OF EVIDENCE OF ANDREW DAVID CARR

Dated: 4 November 2024

Statement of evidence of Andrew David Carr

Introduction

- [1] My full name is Andrew (“Andy”) David Carr. I am a director of Carriageway Consulting Limited, a specialist traffic engineering and transport planning consultancy which I founded at the start of 2014.
- [2] In terms of academic qualifications, I hold a Bachelors (Honours) degree in Computing Science (1988), a Masters degree in Transport Engineering and Operations (1989) and a Masters degree in Business Administration (1998), all from the University of Newcastle upon Tyne in the United Kingdom.
- [3] I am a Chartered Professional Engineer and an International Professional Engineer (New Zealand section of the register). I am 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. I also 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.
- [4] I have more than 35 years’ experience in traffic engineering, during which 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 also in the United Kingdom. I have also been a hearing commissioner and have acted in that role for Greater Wellington Regional Council, Ashburton District Council, Waimakariri District Council and Christchurch City Council.
- [5] Prior to establishing Carriageway Consulting, I was employed by traffic engineering consultancies in which I had senior roles in developing the business, undertaking technical work and supervising project teams primarily within the South Island.
- [6] I have been involved in a number of proposals which have involved assessing the traffic generation and effects of residential developments and plan changes that facilitate residential development. A few

examples include Stonebrook (460 sections in Rolleston), Prestons (over 1,000 sections in Christchurch plus ancillary development) and Awatea (Christchurch, 139 residences). Within Queenstown Lakes district, I have assessed the effects arising from Plan Changes 4 (North Three Parks, 600 residences), 41 (Shotover Country, 770 residences plus commercial development), and 45 (Northlake, 1,600 residences plus ancillary development).

- [7] Within Central Otago I have provided advice for Plan Changes 12 (Wooing Tree, 210 residences plus ancillary development), 13 (River Terrace, 690 residential lots plus 150 retirement village units) and 14 (Ripponvale (up to 160 rural lifestyle properties). I provided advice on transportation matters for several submitters to the Council's Plan Change 19 (Residential Zoning), and provided advice for the redevelopment of the Cromwell Top Ten Holiday Park for 180 residences (RC170378).
- [8] More generally in the district, I have provided traffic advice for the NPD service station on McNulty Road, the Kiwi Water Park at Lowburn, the expansion of the Cromwell New World, the development of the Scapegrace Distillery, and extending the development at Highlands Park.
- [9] As a result of my experience, I consider that I am fully familiar with the traffic characteristics of development such as proposed, and the local transportation networks.

Code of Conduct for Expert Witnesses

- [10] While this is not an Environment Court hearing I have read and agree to comply with the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2023. This evidence is within my area of expertise, except where I state that I am relying on material produced by another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

Scope of evidence

- [11] I have been asked by TKO Properties Limited (**the Applicant**) to give expert traffic evidence in respect of RC230179, being an application for a 33-lot subdivision at Rocky Point on Tarras-Cromwell Road (SH8).
- [12] I initially provided advice regarding the appropriate formation of the State Highway 8 / Bendigo Loop Road intersection (my letter dated 24 October 2023). I also participated in discussions with the New Zealand Transport Agency (**NZTA**) in respect of the manner in which the intersection could be addressed through this consent. As part of this, I updated my earlier letter to reflect the most recent information available and to address NZTA's comments (my letter dated 5 July 2024). I adopt the latter letter for the purposes of my evidence, other than where I provide further information below.
- [13] My evidence will address:
- (a) the traffic-related effects of the proposal;
 - (b) the traffic-related issues raised in submissions, including those in the submission of NZTA; and
 - (c) my response to the traffic matters raised in the Central Otago District Council planner's section 42A report.
- [14] Over the past 13 years I have regularly travelled past the State Highway 8 / Bendigo Loop Road intersection when driving between Queenstown and Christchurch, but I also specifically visited the intersection as part of this commission in 2023 and in early 2024.

Executive summary

- [15] I have reviewed the current transportation environment at the State Highway 8 / Bendigo Loop Road, and consider that the proposed development can be accommodated provided that the intersection is upgraded to a 'Diagram E' layout. I have liaised with NZTA in this regard and a condition of consent is proposed to ensure that this design outcome is achieved.

- [16] I have read the s 42A report and the Addendum report of Mr Vincent. In response to the matters he raises, I confirm that I am able to support a gradient of 15% on the internal roading network, as this gradient is permitted under the 2010 version of Standard NZS4404 for the number of houses proposed. The matters of signage, railings and safety measures and typically deal with when engineering approvals are sought but there are no constraints to providing these.
- [17] I concur with Mr Vincent that the increase arising from the proposal means that Bendigo Loop Road should be sealed between the highway and site access.
- [18] Several conditions of consent refer to roading designs being expected to meet Council's Addendum to the 2004 version of NZS4404. However the 2004 version of this Standard was withdrawn and replaced in 2010, and the Council is presently reviewing the Addendum. In effect there are two different design standards currently applicable – the Council's Addendum (based on a withdrawn Standard and which is being updated), and the 2010 version of the Standard, which reflects more current thinking but differs to the Addendum.
- [19] Consequently I consider that conditions of consent that explicitly refer to the Council's Addendum should be reworded to allow for a degree of flexibility, such as through including wording that gives Council Engineers the ability to approve alternative approaches. This would mean that the design can achieve the most relevant guide or Standard at the time it is produced.
- [20] Finally, Mr Vincent highlights that the inclusion of visitor accommodation may change the traffic generation of the site. Traffic associated with visitor accommodation generally occurs outside the peak times because visitors have no need to travel to work or carry out the 'school run'. However I have worked through the traffic generation characteristics of visitor accommodation, and find that a Diagram E arrangement, without any auxiliary turning lanes, remains the appropriate layout.
- [21] Consequently, having reviewed the transportation-related aspects of the proposal and subject to the inclusion of a condition of consent regarding

the upgrading of the State Highway 8 / Bendigo Loop Road intersection, I consider that any safety or efficiency related effects on the state highway will be appropriately mitigated. I therefore remain able to support the proposal from a transportation perspective.

Transportation Environment

- [22] The prevailing transportation environment remains as described in my letter of July 2024, with State Highway 8 providing one traffic lane in each direction with a narrow shoulder. The speed limit remains at 100km/h.
- [23] Traffic volumes on the highway are modest. As set out in my letter, the highway carries an Average Annual Daily Traffic of 2,286 vehicles (two-way), with 228 vehicles (two-way) in the weekday morning peak hour and 369 vehicles (two-way) in the weekday evening peak hour.
- [24] The traffic surveys show that in the morning, most traffic travels northbound past the site (that is, 63.6% of traffic travels towards Tarras) and southbound in the evening (59.8% of traffic travels towards Cromwell).
- [25] The MobileRoad website now indicates that Bendigo Loop Road carries 115 vehicles per day (two-way), slightly lower than the 140 vehicles that I previously reported. However this is not material, and I anticipate that the road continues to carry around 20 vehicles (two-way) in the peak hours.
- [26] I have used the Waka Kotahi Crash Analysis System (**CAS**) to update my assessment of reported crashes within 500m of the State Highway 8 / Bendigo Loop Road intersection. In my letter of July 2024 I set out that there had been no crashes in the period of 2019 to 2023, plus the partial record for 2024. I confirm that since then, no other crashes have been recorded, and I therefore remain of the view that the crash record in the area does not indicate that there are any latent road safety issues on this part of the network.

[27] I consider additional matters relating to the internal roading and the form of the State Highway 8 / Bendigo Loop Road intersection when I address the submissions received and the s 42A report.

Submissions

[28] I have read the submissions received on the proposal, and comment below. In practice though, only two raised matters relating to transportation.

Fire and Emergency New Zealand

[29] Fire and Emergency New Zealand (**FENZ**) notes that the widths of the proposed roads and right of ways are considered suitable for fire appliances but that the potential 3m driveway width would not be suitable if driveways were longer than 70m or if driveways were steeper than 1 in 5.

[30] I confirm that FENZ's position is consistent with their inputs on other projects with which I have been involved, and the design requirements are simply an outcome of the nature of the vehicles which they use. The drawings provided to me confirm a gradient for the roads of at most 1 in 6.67 (as I discuss further in paragraph 40 below) and the widths of the roads are in excess of 5m. However at the present time, the driveways between the roads and the properties are not designed and therefore no comment can be made on this matter.

NZTA

[31] NZTA's submission relates to the layout of the State Highway 8 / Bendigo Loop Road intersection, which was the topic addressed in my letter of July 2024. To recap my conclusions, I found that the current levels of traffic using Bendigo Loop Road are such that the existing intersection layout falls below the expected standards, which includes shoulder widening of up to 3.5m on each side of the highway.

[32] Although this is an existing deficiency in the roading network, the proposal will exacerbate this by increasing traffic on Bendigo Loop Road

even further. Accordingly the Applicant has agreed to volunteer a condition of consent that:

Prior to the issuing of a certificate pursuant to Section 224(c) of the Resource Management Act 1991, the Consent Holder shall provide to Council, correspondence from the NZ Transport Agency confirming that works in the State Highway, including the upgrading of the Bendigo Loop Road/State Highway 8 intersection to a Diagram E standard, have been constructed to the NZ Transport Agency standards.

[33] It is my understanding that this condition of consent is acceptable to NZTA as a means of ensuring that the safe and efficient operation of the highway is maintained.

Response to Council Officers

[34] I have read the s 42A report of Mr Vincent in respect of the proposal dated 28 March 2024, and also an Addendum Report by Mr Vincent dated 27 September 2024. I respond to his transportation-related comments below.

[35] Traffic matters are addressed in paragraphs 6.75 onwards in the s 42A report. Before discussing these however, by way of background, subdivision in New Zealand is addressed outside the Resource Management Act by Standard NZS4404 (Land Development and Subdivision Infrastructure'). A version of this was published in 2004, and in 2008, Central Otago District Council issued an Addendum document that set out changes to the 2004 Standard that they wished to implement in the district.

[36] In 2010, the 2004 version of NZS4404 was formally withdrawn by Standards New Zealand, and a new version (dated 2010) was published. The 2010 Standard has a number of important differences to the 2004 version in respect of roading matters, including regarding legal and formed road widths. However the Council has not yet issued a revised version or withdrawn its 2008 Addendum (although I have been advised by the Council that they are currently in the process of reviewing it).

[37] In effect then, there are two different design standards applicable – the Council’s Addendum, which has been approved by the Council but is based on a Standard that was superseded and withdrawn more than 14 years ago, and which is also in the process of being updated, and the 2010 version of the Standard, which reflects more current thinking but does not align with the 2008 Addendum.

[38] I have endeavoured to strike a balance between the two design documents when addressing Mr Vincent’s comments.

Road gradient

[39] In paragraph 6.76 and in respect of the internal roading network, Mr Vincent discusses that the Council is “*accepting of a 15% gradient, provided the formation is reviewed by a transport engineer and any signage, railings, widening or other safety measures are applied in accordance with their recommendations*”.

[40] A 15% gradient on a roadway equates to 1 in 6.67, and the 2010 version of Standard NZS4404, sets out that such a gradient is acceptable for roads that carry a maximum of approximately 200 vehicles per day (in fact, up to 1 in 6.25 is permitted). Having reviewed the drawings, I note that the road will serve 26 residences, and as set out by Mr Vincent, each residence will generate 8 vehicle movements per day, meaning that the road will carry a total of 208 vehicles per day.

[41] On that basis, I am able to support the proposed gradient, on the basis that it is aligned with the expectations of the most recent version of Standard NZS4404.

[42] Mr Vincent also references the provision of “*signage, railings, widening or other safety measures*”. In my experience it is very unusual for these to be addressed at a resource consent stage because they relate to matters of detail and therefore are usually considered when engineering approvals are sought (that is, after consents are granted). As this is essentially a ‘greenfield’ site, I do not consider that there are any constraints to providing appropriate signage, railings, widening or any

other safety measures. I am therefore of the view that these can be addressed when engineering approvals are sought.

Sealing of Bendigo Loop Road

[43] In paragraph 6.77, Mr Vincent notes that the Council engineers recommend that Bendigo Loop Road is sealed between the intersection with Lot 101 and the intersection with State Highway 8, to form a minimum 6.5m wide carriageway. This aligns with a 'Local Sealed' standard, and suitable for traffic flows of 300 to 500 vehicle movements per day, as set out under the Council's Addendum to NZS4404:2004. The 2010 version of the Standard does not set out a threshold at which sealing is justified.

[44] Earlier in this statement of evidence, I noted that Bendigo Loop Road presently carries 115 vehicles per day. On checking the Council's Addendum to NZS4404:2004, this type of road would be a 'Local Gravelled' standard, which is noted as being appropriate for less than 150 vehicle movements per day. I therefore concur that the increase arising from the proposal means that the road transitions from one classification to another, and thus, that sealing the road is an outcome of this.

[45] I have also considered whether sealing the road would be justified without this being set out in the Addendum. There is no 'standard' as to when sealing is expected because it depends on a wide variety of factors. In my experience though, a threshold in the order of 150 vehicles per day is often adopted as a 'rule of thumb' for when sealing a road becomes necessary. Consequently in this case, even if the threshold was to be set slightly higher, I consider that the additional traffic associated with the proposal would result in the need for sealing the road.

Alignment with New Zealand Standards

[46] With regard to the rights-of-way, in paragraph 6.78, Council engineers have recommended that these are constructed to meet their Addendum to NZS4404:2004. As I noted above, the 2004 version of the Standard

has been withdrawn, and so I am concerned that requiring a design based on this means that it does not reflect current thinking and Standards. Moreover, I have been advised by the Council that this Addendum is presently being updated and so depending on timings, specifying the existing Addendum in conditions of consent could require the Applicant to undertake works that do not comply with any new or emerging Council Addendum. In my view, the more appropriate approach would be to allow for flexibility in the design.

- [47] I therefore do not agree with Mr Vincent's proposed Condition 4. In my view it would be more appropriate to refer to designs being "*in accordance with NZS 4404:2004 and Council's July 2008 Addendum to that standard **unless otherwise approved by Council Engineers***". This affords flexibility so that design can achieve the most relevant guide.
- [48] A similar issue arises with Mr Vincent's proposed Condition 9, which requires the application of the 2008 Addendum. I remain of the view that flexibility is needed in order to ensure that the road designs are fit for purpose.
- [49] Paragraphs 6.79 to 6.81 (and others) address the effects at the State Highway 8 / Bendigo Loop Road intersection. I have addressed these above, but in short, consider that the matters are now addressed through the proffered condition of consent.

Visitor accommodation

- [50] The comments in Mr Vincent's addendum generally address the matters in the s 42A report and I have therefore responded to them above. However on pages 14 and 15, he sets out that the inclusion of visitor accommodation may change the traffic generation of the site.
- [51] I agree with Mr Vincent that traffic associated with visitor accommodation generally occurs outside the peak times. This is simply because visitors have no need to travel to work or carry out the 'school run', and so they avoid the typical 'commuter' peak periods. In passing, this means that if any of the residential units within the site were to be used for visitor

accommodation, then the extent of traffic generated by the site would be lower than has been used in all of my assessments to date.

- [52] As I set out in my letter of July 2024, the need for auxiliary turning lanes is based on the traffic volume on the major road (in this case, State Highway 8) and also the number of vehicles turning right or left into the minor approach (in this case, Bendigo Loop Road). This means that even if there was to be a very high volume of traffic turning into Bendigo Loop Road, auxiliary turning lanes are not necessarily required if volumes on the highway are lower at that time.
- [53] On Figure 1 of my July 2024 letter, I showed how traffic flows on the highway change over the course of a day. The busiest hour on the highway (as shown on Figure 1) occurs between 12pm and 1pm on a Sunday, when in 2023 there were 251 vehicles on the highway. Applying the relevant equation, in order for an auxiliary right-turn lane to be justified, in the same hour there would need to be 70 vehicles turning right into the site. I consider this to be implausibly high, because 12pm to 1pm on a Sunday is not a period of time when residential or visitor accommodation generates much traffic.
- [54] At other times and on other days, the number of right-turning vehicles would need to be even higher than this to require an auxiliary right-turn lane. As I set out in my July 2024 letter, looking at the weekday evening peak hour (when it could be argued that more visitors would be turning into Bendigo Loop Road), an auxiliary right-turn lane would only be required if there were more than 80 vehicles turning right in the same hour. For context, this would equate to all inbound traffic from the residential development plus an approximately 180-room visitor accommodation complex. Again, I consider this to be an implausibly high scenario.
- [55] A similar situation arises in respect of an auxiliary left-turn lane, in that in order for a left-turn lane to be warranted, more than 80 vehicles would be required to turn left into Bendigo Loop Road in any one hour. This is highly unlikely to occur.

[56] On page 15 of his addendum, Mr Vincent discusses the appropriate layout for the State Highway 8 / Bendigo Loop Road intersection. I have not addressed these comments in detail as the matter relates to roadways located within the state highway reserve, and I understand that the proposal is acceptable to NZTA.

Conclusion

[57] Having reviewed the transportation-related aspects of the proposal I consider that with the inclusion of a condition of consent regarding the upgrading of the State Highway 8 / Bendigo Loop Road intersection, any safety or efficiency related effects on the state highway will be appropriately mitigated.

[58] Within the site itself, my review shows that the gradient of 15% can be supported with reference to the 2010 version of Standard NZS4404.

[59] Having reviewed the s 42A report and addendum of Mr Vincent, I consider that the matters he raised have either been addressed, are no longer relevant, or can be addressed when engineering approvals are sought. However I do not agree that the 2008 Council Addendum to Standard NZS4404 should be applied to the design of the roading without some flexibility, because the Addendum is based on a superseded Standard and the Addendum itself is presently being updated meaning that it too could be superseded in the foreseeable future.

[60] Overall, and subject to the comments above, I remain able to support the proposal from a transportation perspective.

Andy Carr

4 November 2024