BEFORE HEARINGS COMISSIONERS FOR THE HURUNUI DISTRICT COUNCIL **RC220060 & RC220072**

UNDER THE	Resource Management Act 1991 ("**Act**")
IN THE MATTER OF	an application for consent under section 88 of the Act for subdivision and land use consent for Stages 3-6 of a multi-staged residential development known as 'The Clearing' located at 64 Amberley Beach Road and 187 Carters Road, Amberley
BETWEEN	**UWC LIMITED** Applicant
AND	**HURUNUI DISTRICT COUNCIL** Consent authority

STATEMENT OF EVIDENCE OF WAYNE ANDERSON GALLOT ON BEHALF OF THE APPLICANT, UWC LIMITED

12 MAY 2023

INTRODUCTION, QUALIFICATIONS AND EXPERIENCE

1. My full name is Wayne Anderson Gallot. I currently hold the position of Senior Transport Engineer with Novo Group Limited (**Novo Group**), a Christchurch based resource management and traffic engineering consulting company. I have 20 years of experience as a Transport Planner / Engineer in New Zealand. This work has included roles in the private and public sectors, most recently as a Senior Transportation Engineer with Christchurch City Council prior to joining Novo Group in November 2021.

2. My qualifications include a Bachelor of Commerce and Management from Lincoln University (1995) and a Post Graduate Certificate in Engineering (Transport) from the University of Canterbury (2015). I hold a certificate of completion from Waka Kotahi New Zealand Transport Agency's Safe System Engineering course (2018) which endorses me to undertake Network Safety Assessments, Crash Reduction Studies, and Road Safety Audits. I also hold a certificate of completion for a Road Safety Audit course presented by Australian based company Safe System Solutions Pty Ltd (2022). I am a member of Engineering New Zealand's Transportation Group.

3. I prepared the Integrated Transport Assessment (ITA), dated May 2022, that accompanied the resource consent application for the purposes of public notification.

Code of Conduct

4. I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2023. I have complied with it in preparing this evidence and I agree to comply with it in presenting evidence at this hearing. The evidence that I give is within my area of expertise except where I state that my evidence is given in reliance on another person's evidence. I have considered all material facts that are known to me that might alter or detract from the opinions that I express in this evidence.

SCOPE OF EVIDENCE

5. My evidence is presented on behalf of the applicant, UWC Limited.

6. It addresses the transport related matters associated with Stages 3-6 of the proposed subdivision and land use development (known as The Clearing), and is structured as follows:

   (a) Executive Summary.

   (b) Proposal.

   (c) Summary of the Integrated Transport Assessment.

   (d) Response to Council's Section 42A Report.

   (e) Submissions.

   (f) Conclusion.

7. In preparing this evidence, I have relied on and reviewed the following documents:

   (i) My original integrated transport assessment and additional memorandum dated 22 July 2022 prepared in response to a Council request for further information relating to the inclusion of cross-junction intersections within the subdivision.

   (ii) Council's Section 42A report (including technical evidence prepared by Hayden Kent in relation to roading and transportation matters).

   (iii) Submissions received – noting that ten submissions raise transport related matters.

EXECUTIVE SUMMARY

8. The proposed Stage 3-6 development includes 201 residential lots, with an assumed potential for a further 50 lots / dwellings on balance Lot 5000.

9. The Stage 3-6 development is estimated to generate 1,608 vehicle movements per day and 181 vehicle movements per peak hour. Combined

with consented Stage 1-2 (123 lots) and potential future development of 50 additional dwellings on balance Lot 5000, the total combined site generated traffic volume is estimated to be around 2,992 vehicle movements per day and 337 vehicle movements per peak hour.

10. The proposed internal road network provides for a relatively simple and logical layout that is consistent with the consented Stage 1-2 road network and provides good connections to the wider local, district and regional road network. While there are minor departures from District Plan and/or Hurunui District Council Engineering Standards in regard to road corridor widths and footpath provisions, there is general agreement with Council's Consents Engineer that the proposed internal road layout is fit for purpose and will provide an appropriate level of service.

11. Traffic modelling undertaken at the application stage as well as further modelling undertaken in conjunction with the preparation of this evidence demonstrates that acceptable levels of service will be maintained at the three key intersections on the surrounding road network with which this development will interact.

12. In terms of the planned new road link connection with Carters Road (SH1), and the existing intersection of Carters Road (SH1) with Amberley Beach Road, Waka Kotahi NZ Transport Agency were consulted at the application stage and subsequently provided a letter confirming their agreement in principle.

13. Council's s42A report and technical evidence from Council's Consents Engineer have identified a potential issue with timing of development and public vesting of the planned new road link to Carters Road (SH1). However, additional traffic modelling undertaken in preparation of this evidence indicates that the surrounding road network (particularly the two key intersections on Amberley Beach Road) will continue to operate at an acceptable level of service even without the planned new Carters Road (SH1) link in place.

14. Overall, it is considered that the proposed development can be supported from a transportation perspective.

THE PROPOSAL

15. From a transport perspective, the key aspects of the proposal include the following:

(a) Development of 201 residential lots in Stages 3-6 of The Clearing development, with potential for a further 50 lots on a balance lot (Lot 5000) subject to design. It is assumed that each lot will be developed in future with a single residential dwelling.

(b) Provision of an internal roading network that will connect to Carters Road (SH1) via a planned new road and intersection, and to Amberley Beach Road via the consented Stage 1-2 road network and upgraded intersection with Rosewood Drive being delivered in conjunction with the consented Stage 1-2 development.

(c) The primary spine road through the Stage 3-6 development continues the formation of the consented Stage 1-2 spine road, comprising an 11m carriageway within an 18m road corridor and provision of 1.5m wide footpaths on both sides of the road.

(d) The secondary road network typically provides for 15m wide road corridors to accommodate 9m wide carriageways with a 1.5m wide footpath on one side of the road only. The road corridor serving Lot 197 and Lots 200-205 has a proposed width of 13m, accommodating a 7.5m wide carriageway and a 1.65m wide footpath on one side of the road only.

(e) Based on the adopted trip rates of 8 vehicle movements per unit per day and 0.9 vehicle movements per unit per peak hour, the proposed Stage 3-6 development is estimated to generate around 1,608 vehicle movements per day and 181 vehicle movements per peak hour. Over the wider development site, and including the 123 lots / dwellings in the consented Stage 1-2 development and possible future development of 50 additional lots / dwellings on the Stage 3-6 balance lot (Lot 5000), total traffic generation is estimated to be around 2,992 vehicle movements per day and 337 vehicle movements per peak hour as summarised below:

(i) Stage 1-2 (123 lots / dwellings) = 984 vehicle movements per day and 111 vehicle movements per peak hour.

(ii) Stage 3-6 (201 lots / dwellings) = 1,608 vehicle movements per day and 181 vehicle movements per peak hour.

(iii) Balance Lot 5000 (50 lots / dwellings) = 400 vehicle movements per day and 45 vehicle movements per peak hour.

SUMMARY OF INTEGRATED TRANSPORT ASSESSMENT

16. My original transport assessment accompanied the notified Application. The main sections from that assessment are summarised below.

17. The site location can generally be described as east of Carters Road (State Highway 1) and south of Amberley Beach Road in the Hurunui District township of Amberley.

Existing Environment

18. The existing traffic environment is described in detail in the original transport assessment, including a summary of road characteristics and formation details for Carters Road (State Highway 1), Amberley Beach Road and Rosewood Drive.

19. Daily traffic volumes indicated in the transport assessment for Carters Road (State Highway 1) were obtained from Waka Kotahi NZ Transport Agency data available from the Agency's website, whereas daily volume estimates for Amberley Beach Road and Rosewood Drive were obtained from the Mobile Road web-based application. The AM and PM peak volumes reported for Carters Road (State Highway 1) and Amberley Beach Road were actual volumes recorded by Novo Group in surveys conducted in June 2020.

20. It should be noted that the Carters Road (State Highway 1) volumes reported in the original transport assessment were from 2018 count data. More recent Average Annual Daily Traffic (AADT) data for 2021 is available on the Waka Kotahi NZ Transport Agency's website, however hourly data

is not available. The updated AADT volume for 2021 is 11,422 vehicles per day, which represents a non-compounding average annual growth rate of around 2.18 percent from the 2018 AADT volume of 10,721 vehicles per day. However, traffic modelling referred to the original traffic assessment that was previously undertaken of the new Carters Road (SH1) intersection in conjunction with the Amberley Retirement Village development and of the Carters Road (State Highway 1) – Amberley Beach Road intersection in conjunction with the approved Stage 1-2 development for The Clearing used a higher non-compounding average annual growth rate of 2.62 percent. On that basis, previous modelling results and conclusions drawn from those results can be considered robust despite the use of older 2018 base volumes.

21. The original traffic assessment identified and discussed eight reported crashes on Carters Road (SH1) and Amberly Beach Road (including the intersection of those roads and other key intersections along Amberley Beach Road) in the vicinity of the site for the full five-year period 2017-2021 plus available 2022 data up to 9 May 2022. An updated search of the NZ Transport Agency's Crash Analysis System (CAS) database run on 8 May 2023 for the same area reveals two further crashes as below:

    (a) A non-injury crash in January 2022 on Amberley Beach Road near Seadown Crescent. This crash involved a trailer which uncoupled from its towing vehicle and crashed into adjacent residential property fences.

    (b) A serious injury crash in January 2023 on Carters Road (SH1) at the intersection of the service / property access road section of Carters Road. This crash involved a southbound car waiting to turn right into Carters Road that was hit from behind by a following truck. The car was then pushed forward into the path of an oncoming northbound car. Driver fatigue was noted as a possible contributing factor.

District Plan Compliance

22. The proposal results in two non-compliances against the Transport standards in the Hurunui District Plan. The identified non-compliances

relate to road corridor widths being less than 20m and secondary roads within the development not providing a footpath on both sides of the road.

Road Widths

23. Importantly, in terms of road widths, the proposed road network design for the Stage 3-6 development continues the same form as that within the previously approved Stage 1-2 development. The 11m carriageway width of the proposed primary road through the site is consistent with that required for urban collector roads and urban local roads longer than 200m under section 3.8.1.1.2 of the Council's Engineering Standards. The 11m carriageway width proposed is also the same as that of Rosewood Drive and other established roads through the Oakfields development. The primary road design provides a higher standard design than that anticipated in the New Zealand Standard NZS4404:2010 Land Development and Subdivision Infrastructure Figure E12 design scenario for local roads serving 1-200 dwelling units. While the primary road design deviates slightly from the Figure E13 design scenario for collector roads serving up to 800 dwelling units, it is considered that it still achieves the overall intent while notably serving less than half the number of dwelling units anticipated in that design scenario. Importantly, the 11m carriageway width proposed comfortably provides for two-way traffic flow as well as parking on both sides of the road.

24. The majority of the proposed secondary roads within the development are designed in full accordance with the New Zealand Standard NZS4404:2010 Figure E12 design scenario. This includes a road corridor width of 15m, and a proposed carriageway width of 9m which provides for parking on both sides of the road whilst still providing for low-speed two-way traffic flow. The 9m carriageway width of these roads also complies with Council's Engineering Standards.

25. The secondary road serving proposed Lot 197 and Lots 200-205 has a carriageway width of 7.5m, which exceeds that of the New Zealand Standard NZS4404:2010 Figure E12 design scenario. This carriageway width provides either for parking on one side of the road while still providing for low-speed two-way traffic flow or parking on both sides of the road with a single traffic lane between. Given the low number of Lots served by this

road, its short length and the connections provided at each end, the proposed 7.5m carriageway width is considered appropriate.

Footpaths and Pedestrian Connections

26. The proposed internal road network design, with footpaths on both sides of the primary road and on one side of the secondary roads, is in general accordance with Council's Engineering Standards, which requires the provision of a 1.5m wide footpath on at least one side of all urban roads, preferably on the western or southern side of the road.

27. While the proposed secondary road footpaths will not always be on the western or southern side of the road, the design ensures that a continuous footpath is provided on one side of the road. It is anticipated that other pedestrian connections through proposed reserve areas will also be provided within the development to complement the footpath network along the primary and secondary roads.

Road Layout

28. The proposed internal road network provides for a relatively simple and well-connected layout, with the primary road following a logical alignment through the site to connect with the Stage 1-2 primary road at the eastern site boundary and the planned new road and intersection off Carters Road (State Highway 1) at the northwest corner of the site. The secondary road network also provides a generally simple layout with logical connections to the primary road.

29. Overall, the proposed internal road layout, including road and carriageway widths as well as intersection form and spacing, is considered to be fit-for-purpose.

30. Subject to final road and intersection formation, stopping restrictions may need to be considered in certain locations at the detailed design stage in order to provide appropriate sight distances. The identified locations include:

    (a) Along the southwest side of the primary road outside Lot 284.

    (b) Along the northeast side of the primary road outside Lot 209.

(c) Along the northwest side of the primary road outside Lots 217-218.

(d) Along the northeast side of the secondary road outside Lots 290-292.

31. The Request for Further Information (**RFI**) issued by Council on 16 June 2022, indicated their preference for the two cross-junction intersections within the development to be replaced with T-junction intersections on the basis of safer road design.

32. My letter response (dated 22 July 2022) to that RFI matter acknowledged that staggered T-junction intersections were generally considered within the traffic engineering and road safety industry as being safer than cross-junctions due to the comparative reduction in the number and severity of conflict points within each intersection type. However, the RFI response also referred to sections of the Austroads document Road Safety Engineering Risk Assessment Part 6: Crash Reduction Factors (2010) which suggested that further research in that area is still required and noted that some research identified an increased crash risk at staggered T- junction intersections with minor roads.

33. As indicated in the RFI response, I consider that safety benefits of staggered T-junctions compared to cross-junction intersections are more relevant to higher speed (and particularly rural) cross-junction intersections. Further, it is my experience that discussion on the relative safety merits of staggered T-junctions vs cross-junction intersections generally focuses on vehicle vs vehicle crash types, and there is often little (if any) consideration of pedestrian crash risk.

34. Figure 1 of the RFI response illustrated the possibility of four separate pedestrian desire lines across the major road with a staggered T-junction intersection layout, double that which would potentially be associated with a cross-junction intersection layout. Given the relatively low-volume and low-speed environment with The Clearing development, it is my opinion that the inclusion of two cross-junctions in The Clearing Stage 3-6 roading layout is acceptable.

Traffic Generation and Road Network Effects

35. As discussed earlier in this evidence, future development of 201 residential dwellings within the Stage 3-6 development is estimated to generate around 1,608 vehicle movements per day and 181 vehicle movements per peak hour. Including a further 50 dwellings associated with future development of balance Lot 5000, and the 123 dwellings withing the approved Stage 1-2 development, the total future combined traffic generation of The Clearing development is estimated to be around 2,992 vehicle movements per day and 337 vehicle movements per peak hour.

36. Distribution scenarios were developed for site generated traffic based on travel patterns indicated in NZ Census data and also taking into account existing and future local road connections as well as local attractions / destinations such as the Brackenfields shopping centre on the corner of Carters Road and Amberley Beach Road, other local businesses along Carters Road as well as Amberley School on Douglas Road.

37. Future AM and PM peak turning movement volumes at the planned new Carters Road (State Highway 1) and existing Carters Road (State Highway 1) – Amberley Beach Road intersections were then derived from the estimated site-generated traffic volumes and the adopted distribution scenarios. It was identified that the future intersection volumes were similar to those previously used in modelling associated with the approved Stage 1- 2 development and the approved Amberly Retirement Village development. Most significantly, the critical right turn movement out of Amberley Beach Road onto Carters Road (State Highway 1) was only estimated to be 6 vehicles per hour more than that previously considered under the Stage 1-2 consent, and the critical right turn movement out of the planned new road onto Carters Road (State Highway 1) at the new intersection was estimated to be between 16-37 vehicles per hour less than that previously considered under the Amberley Retirement Village consent. Given the similarity of the estimated future volumes to those already used in previous modelling associated with consented developments, and on the basis of discussion and agreement in principle with Waka Kotahi NZ Transport Agency staff, no further modelling of those state highway intersections was considered necessary.

38. Detailed modelling of the Amberley Beach Road – Rosewood Drive intersection (where the Stage 1-2 road will form the 4th leg of a new cross-junction) was also considered unnecessary on the basis of the low ambient traffic volumes on Amberley Beach Road and Rosewood Drive. Further, on the basis of those low ambient traffic volumes, it was suggested in the original traffic assessment that the new cross-junction intersection would still operate at a good level of service (LoS A – LoS B) during peak periods even if all (Stage 1-6) development traffic used this intersection. It is therefore not considered critical that the planned new road and intersection onto Carters Road (SH1) is operational prior to development occurring within proposed Stages 3-6. This is addressed in further detail later in my evidence.

COUNCIL'S SECTION 42A REPORT

39. I have reviewed Council's s42A report prepared by Helga Bennett, as well as the accompanying technical evidence in relation to roading and transportation matters prepared by Council's Consents Engineer (Hayden Kent).

Road Network Layout and Road Widths

40. Mr Kent's evidence states that he considers the proposed internal roading network to be logically laid out with good connectivity, and notes that the proposed primary road alignment accords with Council's infrastructure strategy for roading. Mr Kent does not raise any concerns relating to proposed road widths, noting that these generally accord with Council standards or, with one exception, reduced width standards consistent with those consented in Stage 1-2 of the development. Mr Kent further clarifies that the exception he refers to is the section of road serving Lot 197 and Lots 200-205 (a total of 7 lots) that has a 7.5m carriageway within a 13m road corridor width, but considers this formation to be suitable for the level of service required for 7 lots.

41. In relation to the matters above, there is general agreement between myself and Mr Kent. Further, Ms Bennett generally accepts and adopts Mr Kent's evidence on these matters in her own s42A report.

Site Generated Traffic Distribution and Planned Carters Road (SH1) Intersection

42. Mr Kent acknowledges the traffic generation estimates, distribution scenarios and associated modelling presented in the original Novo Group transport assessment but raises questions around timing of development in terms of coordination with development and vesting of the new road link and intersection with Carters Road (SH1) that is to be constructed as part of the adjacent retirement village development. Ms Bennett also discusses this matter in her s42A report, noting that the retirement village development obtained land use consent only and did not include subdivision consent which may have otherwise provided the necessary mechanism to vest the new road link with Council as public road.

43. It is my understanding that, while a subdivision consent for the retirement village development has not yet been obtained or lodged, it has always been the intention of that developer to obtain subdivision consent at some point and vest the new link road. This aligns with plans I have seen for the consented retirement village development, which specifically identify the new road link as 'Road to Vest'.

44. The matter for consideration then is whether any development controls need to be imposed that limit the number of developed lots or occupied dwellings prior to construction and vesting of the new road link and intersection on Carters Road (SH1).

45. In his paragraph 6.6, Mr Kent suggests that the transport assessment did not provide any information on when the link road and connection to Carters Road would be required for the proposed roading network to function safely. I do not entirely agree on this point.

46. While not a comprehensive or detailed discussion, paragraph 65 of the transport assessment notes the following:

> *65. The low ambient volumes on Amberley Beach Road and Rosewood Drive are such that it is considered unnecessary to undertake detailed modelling of the upgraded Amberley Beach Road – Rosewood Drive intersection (where the Stage 1-2 road will form the 4th leg of the cross-junction). Indications are that this intersection would still operate at a good level of service (LoS A – LoS B), with minimal delays turning into*

or out of Rosewood Drive and/or the new Stage 1-2 access road, during peak periods even if all development traffic used this intersection. It is therefore not considered critical that the planned new road and intersection onto Carters Road (SH1) is operational prior to development occurring within proposed Stages 3-6.

47. In the absence of (detailed) transportation modelling supporting an alternative, Mr Kent recommends that records of title be issued to no more than 50% of the proposed development until the roading link to Carters Road has been constructed (and presumably vested a public road).

48. Subsequent to preparing the original transport assessment, I conducted a weekday AM peak survey of the existing Amberley Beach Road – Rosewood Drive intersection between 7:30am and 9:00am on Wednesday 19 October 2022. The purpose of that survey was to undertake modelling that might then inform whether the upgraded intersection (with the new Stage 1-2 road forming the fourth leg) could efficiently operate as a 4-leg cross junction or (at some point) would require development of a roundabout control. At the time of the survey, the intersection and surrounding road network was operating normally. Construction of the Stage 1-2 access road and associated intersection changes had not begun, and there was no temporary traffic management in place that might have otherwise influenced traffic volumes or patterns.

49. Analysis of the survey data revealed the peak hour within the 1 ½ hour survey period was 7:45-8:45am. During that peak hour, there were a total of 168 vehicle movements through the intersection of which 151 were cars / light vehicles and 17 were heavy vehicles. In addition, there were six construction vehicle movements (2 light and 4 heavy) into and out of the Stage 1-2 development site. As a matter of interest, 25 (16.6%) of the 151 light vehicle movements recorded through the intersection were directly associated with the adjacent Oakfields Preschool.

50. To account for undeveloped sites within the Oakfields development (as well as other subdivisions in the area) as well as possible spare capacity at the preschool, the recorded base intersection volumes were doubled to represent a rudimentary future year base volume scenario. Modelling was then undertaken of the intersection with the Stage 1-2 road forming the

fourth leg of a simple 4-leg, Give Way controlled cross junction. Four scenarios were modelled using SIDRA Intersection software as below:

(a) Surveyed base volumes + estimated Stage 1-6 development traffic (with new Carters Road intersection opened).

(b) Surveyed base volumes + estimated Stage 1-6 development traffic (without new Carters Road intersection opened – i.e. all Stage 1-6 traffic through the Amberley Beach Road intersection).

(c) Surveyed base volumes (+100% to account for undeveloped Oakfields sites and spare capacity at the preschool) + estimated Stage 1-6 development traffic (with new Carters Road intersection opened).

(d) Surveyed base volumes (+100% to account for undeveloped Oakfields sites and spare capacity at the preschool) + estimated Stage 1-6 development traffic (without new Carters Road intersection opened – i.e. all Stage 1-6 traffic through the Amberley Beach Road intersection).

51. The SIDRA modelling results indicated that the intersection would continue to operate with excellent levels of service and average delays of only 9.2 seconds or less with or without the new road link to Carters Road in place and all Stage 1-6 development traffic going through the Amberley Beach Road – Rosewood Drive intersection as summarised in **Table 1** below.

Table 1: SIDRA Results Summary – Amberley Beach Road-Rosewood Drive-New Road

Scenario		ABR (west)			Rosewood (north)			ABR (east)			New Road (south)		
		L	T	R	L	T	R	L	T	R	L	T	R
Existing Intersection	Surveyed Volume (vph)	30	41	3	10	0	17	0	62	8	2	0	1
Scenario 1 Base + Stg 1-6 (with new Carters Road link)	Volume (vph)	30	41	29	10	5	17	4	62	8	86	16	13
	Average delay (sec)	4.8	0.1	4.9	4.8	4.1	6.2	4.8	0.0	4.9	4.9	4.2	5.6
	Level of service (LoS)	A	A	A	A	A	A	A	A	A	A	A	A
Scenario 2 Base + Stg 1-6 (without new Carters Road link)	Volume (vph)	30	41	71	10	9	17	4	62	8	212	28	13
	Average delay (sec)	4.9	0.2	4.9	4.8	4.3	7.8	4.8	0.0	4.9	4.9	4.6	6.1
	Level of service (LoS)	A	A	A	A	A	A	A	A	A	A	A	A
Scenario 3 Base + 100% + Stg 1-6 (with new Carters Road link)	Volume (vph)	60	82	29	20	5	34	4	124	16	86	16	13
	Average delay (sec)	4.9	0.2	5.2	4.9	4.8	7.3	5.1	0.1	5.2	5.1	5.1	6.5
	Level of service (LoS)	A	A	A	A	A	A	A	A	A	A	A	A
Scenario 4 Base + 100% + Stg 1-6 (without new Carters Road link)	Volume (vph)	60	82	71	20	9	34	4	124	16	212	28	13
	Average delay (sec)	5.0	0.3	5.2	4.9	5.1	9.2	5.1	0.1	5.2	5.2	5.7	7.3
	Level of service (LoS)	A	A	A	A	A	A	A	A	A	A	A	A

52. In terms of the Carters Road (SH1) – Amberley Beach Road intersection, the previous transport assessment (prepared by Mr Chesterman of Novo Group) for the now consented Stage 1-2 development included SIDRA modelling results and associated discussion in relation to operation of that intersection during the PM peak period. Key points to note from Mr Chesterman's report in relation to this matter include:

(a) Future base traffic volumes were derived from surveyed traffic volume data obtained in June 2020, with a growth factor of 26.2% (10 years growth) applied to the Carters Road (SH1) through traffic volumes.

(b) All estimated Stage 1-2 traffic was assumed to travel through the Carters Road (SH1) – Amberley Beach Road intersection, based

on the distribution patterns of the surveyed turning volumes. It was assumed that no Stage 1-2 traffic would filter through the local road network north of Amberley Beach Road.

(c) Results of the SIDRA modelling indicated that, even with all Stage 1-2 traffic added to the derived future base volumes, level of service LoS A would be retained on both Carters Road (SH1) legs with average delays for the left and right turn movements of 0.1 seconds and 9.7 seconds respectively. The left turn movement from Amberley Beach Road degraded slightly from LoS A (8.7 seconds average delay) to LoS B (10.1 seconds average delay). The right turn movement from Amberley Beach Road degraded from LoS D (29.4 seconds average delay) to LoS E (35.2 seconds average delay).

53. In preparing this evidence, I have reviewed and modified Mr Chesterman's SIDRA model as below:

(a) Through lane widths on Carters Road (SH1) were reduced to 3.6m from the 5.0-5.5m widths in Mr Chesterman's model.

(b) The length of right turn bay on the Carters Road (SH1) south approach was reduced to 40m from the 60m used in Mr Chesterman's model.

(c) The Amberley Beach Road approach was modelled as a dedicated 3.0m wide right turn lane and separate 15m long, 2.7m wide left turn lane, whereas Mr Chesterman had modelled this approach as a 5.7m wide shared left and right turn lane.

(d) Addition of a nominal 3% heavy vehicle factor on all turns into and out of Amberley Beach Road, where Mr Chesterman's model previously had none.

54. Re-running the adjusted model with the base and base + development traffic volumes used by Mr Chesterman reveals very little change from the results obtained and reported in his previous assessment as indicated above.

55. A third scenario was then tested to include the current Stage 3-6 proposal. For this scenario, the traffic distribution assumptions used in the ITA were generally adopted but modified to remove the planned new Carters Road (SH1) link road. This meant that, apart from relatively small amounts of development traffic using the local road network north of Amberley Beach Road accessing the Brackenfields Shopping Centre, all estimated traffic associated with Stages 1-6 would be travelling through the Carters Road (SH1) – Amberley Beach Road intersection.

56. Modelling of this third Stage 1-6 scenario indicated that average delays on the right turn movement out of Amberley Beach Road would increase to 46.6 seconds compared to 35.5 seconds under the Stage 1-2 scenario and 29.2 seconds under the future base scenario (without any development traffic). The level of service associated with the average delay in the Stage 1-6 scenario remains the same as that for the Stage 1-2 scenario – that is LoS E. The right turn movement from Carters Road (SH1) south into Amberley Beach Road degrades slightly to LoS B with an average delay of 11.0 seconds, compared to LoS A and an average delay of 9.9 seconds under the Stage 1-2 scenario. Average delays on the left turn movements to and from Amberley Beach Road saw a negligible increase of 0.1 seconds, and there was no change to the through movements on Carters Road (SH1).

57. **Table 2** summarises the three PM peak scenarios tested for the Carters Road (SH1) – Amberley Beach Road intersection with the adjusted SIDRA model. It was not possible to model the AM peak period, because base intersection traffic volumes had not previously been surveyed.

Table 2: SIDRA Results Summary – Carters Road (SH1) - Amberley Beach Road

Scenario		Carters (north)		ABR (east)		Carters (south)	
		L	T	L	R	T	R
Scenario 1 Future Base (surveyed 2020 volumes + 26.6% growth on Carters Rd through movements	Volume (vph)	62	642	42	24	459	96
	Average delay (sec)	4.7	0.2	8.1	29.2	0.1	9.0
	Level of service (LoS)	A	A	A	D	A	A
Scenario 2 Future Base + Stages 1-2	Volume (vph)	97	642	56	30	459	151
	Average delay (sec)	4.7	0.2	8.2	35.5	0.1	9.9
	Level of service (LoS)	A	A	A	E	A	A
Scenario 3 Future Base + Stages 1-6 (without new Carters Road link)	Volume (vph)	111	642	92	45	459	214
	Average delay (sec)	4.8	0.2	8.3	46.6	0.1	11.0
	Level of service (LoS)	A	A	A	E	A	B

58. Based on the results of the SIDRA modelling undertaken, it is my opinion that it is not necessary to impose controls or limits on the scale of development allowed to proceed prior to establishment (and vesting as public road) of the planned new road link to Carters Road (SH1).

SUBMISSIONS

59. A number of submissions raise transport-related matters, and these can be generally categorised into the following themes:

(a) Reduced road widths

(b) Footpaths one side only on some roads

(c) Increased traffic

(d) Intersection safety (vehicles and pedestrians) at the planned new Carters Road (State Highway 1) intersection and the Carters Road (State Highway 1) – Amberley Beach Road intersection.

Reduced Road Widths and Footpath Provision

60. These matters have been addressed in detail in the original transport assessment and further summarised in this evidence. Overall, it is considered that the design of the internal road network is fit-for-purpose, with carriageway widths and footpath provisions generally in accordance with Council's Engineering Standards. The design of the Stage 3-6 internal road network also continues the same form as that within the consented Stage 1-2 development and is consistent with carriageway widths and footpath provisions within the adjacent Oakfields development.

Increased Traffic

61. The total future traffic generation of The Clearing development (including consented Stage 1-2, proposed Stage 3-6 and possible future development of balance Lot 5000) is estimated to be around 2,992 vehicle movements per day and 337 vehicle movements per peak hour.

62. Based on the adopted distribution scenarios, and with the new road link through to Carters Road (SH1) open, additional site generated traffic on the adjoining road network during peak periods is estimated as follows:

(a) Amberley Beach Road (west of Rosewood Drive): 115-124 vehicles per hour.

(b) Amberley Beach Road (east of Rosewood Drive): 17 vehicles per hour.

(c) Carters Road (south of new intersection): 130-152 vehicles per hour.

(d) Carters Road (new intersection – Amberley Beach Road): 109-116 vehicles per hour.

(e) Carters Road (Amberley Beach Road – Douglas Road): 92-115 vehicles per hour.

(f) Carters Road (Douglas Road – Pound Road): 56-59 vehicles per hour.

(g) Carters Road (north of Pound Road): 33-35 vehicles per hour.

(h) Rosewood Drive (north of Amberley Beach Road): 21-33 vehicles per hour.

63. It is acknowledged that this additional traffic will be noticeable to some road users and adjacent residents (especially on Amberley Beach Road and Rosewood Drive due to the low ambient volumes on these roads), however resultant traffic volumes are expected to remain within anticipated and acceptable ranges for those roads based on their classifications and intended functions. This is particularly true for Amberley Beach Road, which has a collector road classification.

64. In terms of Carters Road (State Highway 1), resultant volumes will also remain well within the practical capacity limit of 900 passenger car equivalent vehicles per hour per lane for interrupted flow conditions on urban arterial roads as indicated in Austroads Guide to Traffic Management Part 3: Transport Study and Analysis Methods (2020).

65. Additional SIDRA modelling undertaken for preparation of this evidence (as addressed earlier) has also demonstrated that the Amberley Beach Road – Rosewood Drive – new Stage 1-2 road intersection and the Amberley Beach Road – Carters Road (SH1) intersection will both continue to operate at an acceptable level of service even in the event that the new road link to Carters Road (SH1) is not in place prior to development occurring on the site.

Intersection Safety

66. The scheme design for the planned new Carters Road (SH1) link and intersection has been designed to appropriate engineering design standards and includes widening to accommodate a flush median and right turn bay on Carters Road (SH1). In addition, the plan indicates a pedestrian refuge island within the flush median north of the new intersection and associated new pedestrian facilities on the west side of Carters Road opposite the retirement village development. That intersection scheme design was also developed in consultation with Waka Kotahi NZ Transport Agency and on the basis of a speed limit reduction to 50 km/h through the new intersection.

67. Road construction and/or improvement projects such as this are also subject to independent road safety audit processes, typically at the scheme design, detailed design and post-construction stages.

68. As detailed in the transport assessment, and further discussed earlier in this evidence, this proposal is expected to result in future traffic volumes through the planned new Carters Road (SH1) intersection and the Carters Road (SH1) – Amberley Beach Road intersection that are similar to those already modelled, assessed and ultimately accepted / approved in relation to the consented retirement village and Stage 1-2 developments. On this basis, there is no indication that the proposed Stage 3-6 development will result in associated safety issues at these locations.

69. In terms of pedestrian safety at the Carters Road (SH1) – Amberley Beach Road intersection, it is also noted that a new pedestrian crossing facility (with refuge island and kerb buildouts on both sides of the road) was established on Carters Road (SH1) approximately 50m north of the intersection circa late 2020 / early 2021.

CONCLUSION

70. For the reasons outlined in this evidence, it is considered that the proposal can be supported from a transportation perspective.

Wayne Gallot
12 May 2023