

**BEFORE INDEPENDENT HEARING COMMISSIONERS APPOINTED
BY THE WAIMAKARIRI DISTRICT COUNCIL**

IN THE MATTER OF The Resource Management Act 1991

AND

IN THE MATTER OF Hearing of Submissions and Further Submissions on
the Proposed Waimakariri District Plan

AND

IN THE MATTER OF Hearing of Submissions and Further Submissions on
Variation 1 to the Proposed Waimakariri District Plan

AND

IN THE MATTER OF Submissions and Further Submissions on the
Proposed Waimakariri District Plan by **Doncaster
Developments Limited**

**SUPPLEMENTARY TRANSPORTATION EVIDENCE OF RAYMOND JOHN EDWARDS
ON BEHALF OF DONCASTER DEVELOPMENTS LIMITED**

DATE 2 August 2024

Presented for filing by:
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Introduction

1. My name is Ray Edwards. I am a traffic engineering consultant practicing from Christchurch. My qualifications and experience are provided in Appendix A to my primary evidence dated 5th March 2024. My primary evidence reiterated the findings of my transportation assessment (ITA), also dated 5th March 2024, that was provided as Appendix B to my primary evidence.
2. Both above documents relate to submission #290 by Doncaster Developments Limited (Doncaster) to the proposed Waimakariri District Plan to rezone 11.6ha land from a Large Lot Residential Zone (LLRZ) to General Residential Zone (GRZ) at Arlington West, Rangiora (submitter #290).
3. Both above documents have been reviewed by Mr Gregory who is the consultant transportation planner on behalf of the Council. Mr Gregory is not, at the time of writing his evidence, able to support the Doncaster submission. Instead, he seeks further information on:

- 13.2 *For Lehmans Road, Rangiora (Submission #290), I cannot yet support the Medium Density Residential outcome for the location, based on the submitted ODP and lack of consideration of connectivity to Rangiora town. It relies on traffic filtering through local roads to reach key destinations in the town, and does not consider opportunity to encourage active travel into town which could partially mitigate this concern. There is no collector road connection available west of West Belt; practically this cannot be resolved due to the existing road network. There is a proposed route (the Northwest arterial) which would join up with Lehmans Road, however in my opinion this offers only partial mitigation given that it doesn't connect the site to the town. The supporting evidence of Mr Edwards is also acknowledged to be 'preliminary'.*
- 59.1 *The base counts were undertaken at a time when network demands were suppressed by the COVID pandemic.*
- 59.2 *The most direct connection to Rangiora (via Belmont Avenue) is assigned just 20% of total demand, whereas I would expect this to be higher.*
- 59.3 *I also note the proposed yield at less than 10 dwellings per hectare. If a higher density outcome were a reasonable consideration, then additional traffic generation would result.*
- 81.1 *Consideration of active travel connectivity between the site and the town centre/schools and opportunities to provide this;*
- 81.2 *Review of the internal ODP layout to encourage a connected road network, rather than encouraging shared driveways/accessways;*
- 81.3 *Including the walking/cycling path on the ODP along Lehmans Road and the northwest arterial;*



81.4 Measures to prohibit driveways onto Lehmans Road / the northwest arterial.

4. In response to Mr Gregory's evidence, I have been asked by Doncaster to provide this supplementary transportation evidence to respond to Mr Gregory's evidence including the matters identified above.
5. I have also reviewed the relevant sections of the Officers report prepared by Mr Wilson on the northwest Rangiora development area. This supplementary transportation evidence will also respond to the various transport related matters raised in Mr Wilson's report.
6. It is important to note that Mr Gregory is not, at the time of writing his evidence, specifying his final position (and Mr Wilson correctly records this in his paragraph 327). In his paragraph 83, Mr Gregory invites further information from Doncaster on the above matters to enable him to finalise his position in relation to the rezoning proposal. I expect that the content of this supplementary evidence will enable this to occur.
7. At this point I want to note that Mr Gregory's comments are incorrect in his paragraphs 13.2 and 67 where he states that my March 2024 ITA was only a preliminary assessment. As I stated in the introduction to the March 2024 ITA, that report was an update of an earlier preliminary ITA that I prepared in November 2021. The March 2024 ITA was a complete assessment of the transport effects of the proposal following accepted best practice methodology.
8. I repeat from my earlier evidence that I have read the Environment Court's Code of Conduct and agree to comply with it.

Development Capacity of the Subject Site

9. A key issue with potential transport effects of the relief sought by Doncaster is the amount of traffic that could be generated by intensified development of the land compared to what could occur with a lower density residential zoning as currently shown in the proposed District Plan (which I assessed in the March 2024 ITA to be 22 allotments).
10. In Appendix I of the March 2024 ITA provided an indicative subdivision plan showing a possible 105 allotment development of the site under a higher density residential zoning. This site plan did not include Lot 1003 DP526449 and 266 Lehmans Road which would likely provide for around 5 additional allotments. Therefore, the ITA considered a site yield under a GRZ of $105 + 5 = 110$ allotments. Here



I note that Mr Wilson, in his paragraph 361, recommends that 266 Lehmans Road be included in any rezoning proposal.

11. In his paragraph 50, Mr Gregory calculates that 110 allotments across the 11.6 hectare site calculates to a yield rate of 9.5 dwellings per hectare. He comments that this yield rate is less than the 15 dwellings per hectare rate which I note is sought through Rule SUB-S3 of the proposed District Plan. He also calculates that 11.6 hectares at the 15 dwelling per hectare rate calculates to a development yield of $11.6 \times 15 = 174$ dwellings.
12. In his paragraph 367, Mr Wilson identifies a gross site area of 11.85 hectares from adding in 266 Lehmans Road. Once losses for roading and reserves are allowed for he calculates a developable site area of 8.46 hectares. He suggests a maximum average allotment size of 700m^2 and a minimum average allotment size of 350m^2 .
13. In his paragraph 368, Mr Willson calculates yields based on a maximum average allotment size of 700m^2 and a minimum average allotment size of 200m^2 (and not 350m^2 as stated in his paragraph 367). He calculates that
 - a) The 700m^2 average allotment size results in about 135 allotments;
 - b) A 500m^2 average allotment size results in about 190 allotments, and;
 - c) The 200m^2 average allotment size results in about 474 allotments.
14. In response I offer the following comments:
 - a) Mr Gregory's calculations based on a 11.6 hectare site exclude the 0.25 hectares associated with 266 Lehmans Road.
 - b) From Mr Wilsons calculations, I note that $700 \times 135 = 9.45$ hectares of land area. Further, $200 \times 474 = 9.48$ hectares of land area. This is not the 8.46 hectares of land area Mr Wilson otherwise calculates as a developable land area once roads and reserves are allowed for.
 - c) In my experience, with subdivision of land there are losses of around 20% to road reserves, stormwater detention basins and the like. This accords with Mr Wilson's opinion in his paragraph 367 of 18-25%. The 20% value reduces the developable area of the site to $11.85 \times$



80% = 9.48 hectares. If this land area is averaged over 174 allotments, then the average allotment size would be around 544m².

- d) Noting the style of development that has occurred immediately east of the subject site, where there is a selection of sites at around 400-420m² in area, but that most sites are around 700m² in area, I consider an average site size of around 544m² is likely to be too small. However, this needs to be balanced against MDRS provisions for multiple dwellings on one site which, for some larger sites, could decrease the average site area when considered over the entire subject site.
- e) Even with the types of densities anticipated by the MDRS being available, it is extremely unlikely that every allotment would be developed in this way. In my opinion Mr Wilson's calculation of a 474 allotment yield is fanciful.
15. While I agree with Mr Wilson, in his paragraph 368, that the differences in allotment yields are not determinative in respect of the Doncaster proposal, I accept that the transport assessment should consider a higher development yield than 100 allotments as a sensitivity test, and that the 174 allotment figure suggested by Mr Gregory would provide a suitable sensitivity test for potential road network effects of the rezoning proposal. I add that the average 174-allotment size of around 544m² allows for a mix of 700m² allotments as constructed adjacent to the Doncaster site, and a selection of higher density sites such as what, in my opinion, would more likely occur. Therefore, the subsequent sections of this supplementary evidence update my March 2024 ITA assessment to allow for an increase in allotment yield from 110 allotments to 174 allotments.

Estimated Traffic Generation

16. In my traffic assessment and subsequent primary evidence, I applied the traffic generation rate for 'suburban dwellings' of 10.9 trips per dwelling unit per day sourced from Table 7.4 of NZTA Research Report 453 'Trips and Parking Related to Land Use November 2011' (RR453). I estimated that the 110-lot development, assuming one dwelling per allotment under a GRZ, would generate around 1,200 trips per day.
17. In his paragraph 53, Mr Gregory also relies on RR453 but suggests that the 'outer suburban' rate of 8.2 trips per dwelling unit per day be applied to the proposal. In response I note that Section A2.1 of RR453 does not specify what sort of separation distance from a CBD an outer suburban area needs to be, but implies that it is the "outer edge of a city". Because Rangiora is not a city with a larger land



area, and because the subject site is located only three kilometres from the Rangiora CBD, I adopted the higher generation rate as a conservative approach, although I accept that Mr Gregory's rate is likely to be more realistic. Like allotment yield, I do not consider trip generation rate to be determinative in respect of the Doncaster proposal because the surrounding road network provides so many possible route options upon which to distribute site generated traffic.

18. If Mr Gregory's adopted rate of 8.2 trips per dwelling unit per day is applied to 174 dwelling units, then this calculates to a 174-lot development generating around 1,427 trips per day. This is 19% more traffic than my 1200 trips estimate. I will detail in a later section of this supplementary evidence that the additional 227 trips per day, once distributed across the variety of potential routes to and from the site, results in only small differences in road network link volumes such as on Belmont Avenue.

Estimated Traffic Distribution

19. The distribution of residential activity generated traffic depends upon the locations relative to the subject site of key trip attractors, such as the nearest commercial centres, employment centres, schools, and the like. For the March 2024 ITA, I adopted a first principles or logic-based approach with SIDRA software used to test the operational performance of key affected intersections. For convenience, I repeat my estimated traffic distribution from Table 10 from my earlier transport assessment on the next page.

20. In his paragraph 68, Mr Gregory comments that

"Usually, route choice and network effects associated with larger housing developments are tested in transport models, which can predict the traffic patterns and delays associated with proposed development. The models work by predicting the quickest path between the development site and key destinations."

21. In relation to the use of an existing transport model to distribute site generated traffic, I have discussed the proposal with John Falconer of QTP who is a transport modeller with considerable experience. Mr Falconer advised that the subject site is included within an area covered by both the CTM and CAST models, and that Abley have a finer grained Paramics model for Rangiora. He agreed with the comment of Mr Gregory that these types of models could be used to assess larger housing developments, but added that the scale of development sought by the Doncaster submission was not



large enough to warrant such modelling work being undertaken. Instead, he advised a first principles or logic-based approach, such as that undertaken in Table 10 below, would normally be undertaken.

Origin / Destination	Split	Option 1	Split	Option 2	Split	Option 3	Split
To/From South or Southeast	60%	Via Lehmans Road to Fernside Road	25%	Via Sandown Boulevard, Belmont Avenue and Kingsbury Avenue to West Belt then Townshend Road	25%	Via Huntington Drive and Charles Upham Drive (once connected)	10%
To/From North	10%	Via Lehmans Road to River Road	5%	Via Sandown Boulevard, Belmont Avenue and Kingsbury Avenue to West Belt and then River Road	2.5%	Via Sandown Boulevard and Belmont Avenue to Kingsbury Avenue and then Ashley Street	2.5%
To/From East	20%	Via Sandown Boulevard, Belmont Avenue and Kingsbury Avenue to Ashley Street and then Kippenberger Avenue	10%	Via Sandown Boulevard, Belmont Avenue and Kingsbury Avenue to West Belt and then Blackett Street to Kippenberger Avenue.	5%	Via Lehmans Road and Oxford Street then High Street to Kippenberger Avenue.	5%
To/From West	10%	Via Lehmans Road to Oxford Road	10%	n/a		n/a	

March 2024 ITA Table 10: Estimated traffic distribution for trips generated by the subject site

22. In his paragraph 69, Mr Gregory notes that the methodology behind the trip weighting in Table 10 above was not set out in the March 2024 ITA. In response, in Section 3.4 of the ITA I noted that the subject site is very well connected to the wider road network. An inspection of the road layout, and of the locations of key intersections along Oxford Road, indicates that the likely route choices residents will make to access the wider road network will be as shown in ITA Table 2 which is repeated on the next page. Mr Wilson agrees the site is well connected in his paragraph 345.
23. What I omitted from the transport assessment was that I travelled all these routes during the weekday peak periods and found little to no delay on any given route such that route choice would be more influenced by personal convenience or choice than being influenced by road network operation. In other words, there are no existing road network capacity reasons to warrant declining the proposal.



Site location	Option 1	Option 2	Option 3
To/from South or Southeast	Via Lehmans Road to Fernside Road	Via Sandown Boulevard, Belmont Avenue and Kingsbury Avenue to West Belt then Townshend Road	Via Huntington Drive and Charles Upham Drive
To/from North	Via Lehmans Road to River Road	Via Sandown Boulevard, Belmont Avenue and Kingsbury Avenue to West Belt and then River Road	Via Sandown Boulevard and Belmont Avenue to Kingsbury Avenue and then Ashley Street
To/from East	Via Sandown Boulevard, Belmont Avenue and Kingsbury Avenue to Ashley Street and then Kippenberger Avenue	Via Sandown Boulevard, Belmont Avenue and Kingsbury Avenue to West Belt and then Blackett Street to Kippenberger Avenue.	Via Lehmans Road and Oxford Street then High Street to Kippenberger Avenue.
To/from West	Via Lehmans Road to Oxford Road	n/a	n/a

March 2024 ITA Table 2: Likely route choices for trips generated by the subject site

24. In his paragraph 71, Mr Gregory comments that *“The route towards the town centre and most schools may be both actually and perceived to be more direct via Belmont Avenue”*. I do not agree. In my opinion:

- a) The 25% of site generated traffic I allocated to the ‘southeast Option 2’ route in Table 10 earlier recognises that Belmont Avenue has give way controls against it at Oakwood Drive and West Belt, whereas, for example, Huntington Drive and Charles Upham Drive (which are now connected) enjoy priority flow through to Oxford Road (and onto Townshend Road if heading further south).
- b) Even then, I allocated 2.5 times more site generated traffic onto the southeast Option 2 route via Belmont Avenue, than the equally attractive southeast Option 3 route via Huntington Drive which is now connected to Charles Upham Drive.
- c) The 25% of site generated traffic allocated to the southeast Option 1 route via Lehmans Road recognises that there will be a strong attraction between the entire subject site and Christchurch via the Lehmans/Fernside route and that for trips within Rangiora such as to/from the CBD, this route provides a near unimpeded route to Oxford Road.



25. In his paragraph 73, Mr Gregory partially contradicts himself by correctly noting that *“The design of the ODP concept does limit site access to the local road network, via the Sandown Boulevard.”* This reinforces the approach I have taken in points a) to c) above.

Ambient Road Network Traffic Flows

26. Tables 3-7 in my March 2024 ITA provided summary descriptions of the various road network links likely to be used by site generated traffic. In terms of ambient road network traffic flows I relied upon Council and MobileRoad supplied traffic count data as follows:
- a) Lehmans Road – Council count of 1,800 vehicles per day located 400m north of Oxford Road – July 2021;
 - b) Charles Upham Drive – MobileRoad estimate of 1,100 vehicles per day – 2019;
 - c) Sandown Boulevard & Oakwood Drive – MobileRoad estimate of 700 vehicles per day – 2019;
 - d) Belmont Avenue - Council count of 1,050 vehicles per day located 50m west of West Belt – July 2019;
 - e) West Belt - Council count of 6,000 vehicles per day located 100m north of High Street – September 2021, and;
 - f) West Belt - Council count of 3,229 vehicles per day located north of Seddon Street – July 2019.
27. I supplemented this link volume data with weekday PM peak hour traffic counts at the following key intersections which my earlier ITA stated were undertaken on 25 November 2021:
- a) The intersection of Lehmans Road with Oxford Road;
 - b) The intersection of West Belt with Oxford Road and High Street, and;
 - c) The intersection of West Belt with Belmont Street and Kingsbury Street.
28. In his paragraph 60, Mr Gregory comments that my 25 November 2021 intersection counts are *“almost certainly unreliable”* because they were undertaken at a time when the effects of the Covid pandemic could have resulted in reduced traffic flows on the road network. He references the NZTA publication *‘Waka Kotahi Covid 19 transport impact (March 2022), Fieldwork waves 1-27 core report’*. This report summarises the outcomes of a study by research entity Ipsos to enable Waka Kotahi to understand



Covid influenced changes in travel habits, and the subsequent impact of this on the operation of the nationwide road network.

29. Based on his review of this report, Mr Gregory claims in his paragraph 61 that:

“November 2021 coincided with the rise of the Delta variant resulting in a spike of people both self-isolating and concerned to go out. In a significant survey conducted by NZTA, the September – December 2021 period saw a spike in the numbers of respondents partially or fully self-isolating (72%), and a statistically significant 50% increase in those concerned to go out for fear of either infection or transmission.”

In his paragraph 65, Mr Gregory suggests that my surveyed base traffic flows for Belmont Avenue should be increased by 20% to provide for the effects of Covid.

30. In response, I do not recall any sort of Covid related travel restrictions at the time the surveys were undertaken. I subsequently checked the traffic count forms and the project timesheets and these confirmed that my traffic counts were undertaken in November 2021. I have checked the Government’s publication ‘*Timeline of Significant Covid 19 Events*’ which confirms that during November 2021 Canterbury was at Alert Level 2 which allows for businesses to open and services to be provided as normal where this can be done safely. Unlike Auckland at the time, Canterbury was not locked down at all.
31. Further, having read the Waka Kotahi report referenced by Mr Gregory, which is attached as Appendix A to this supplementary evidence, I very strongly disagree with Mr Gregory’s suggestion that my traffic count data is “*almost certainly unreliable.*” In my opinion, Mr Gregory has taken the information from the Waka Kotahi report too far. In my review of this report, I note the following points not raised by Mr Gregory:
- a) The purpose of the study is to have “*regularly updated knowledge on what people are thinking and feeling, and why they are choosing to travel the way they do.*” I note that the study is based on emotive responses provided by respondents, and not quantitative data inputs such as measurement of road traffic volume data (which was readily available nationwide through a network of traffic count telemetry sites).



- b) The study was based on 27 'waves' of survey fieldwork and I note that fieldwork 'Wave 23' was undertaken during at the time of my traffic surveys in November 2021. Here the page 8 table in the report, providing information on the dates of the 27 survey waves, notes that the Wave 23 survey was undertaken during Alert Level 1 which is when people can return to work, travel domestically, and gather without restrictions.
- c) The study received data from an online survey that took a respondent 12-15 minutes to complete. The study report states that there were "*sample boosts to ensure sufficient numbers to analyse key cities of interest, such as Tauranga, Dunedin and Hamilton.*" Yet the sample structure table provided in the report shows that, specifically identified for Canterbury, the study was based on a Christchurch sample of 100 responses out of a total of 1247 responses nationwide. This is important because, according to the Covid timeline provided in the report, the delta variant of Covid was detected in New Zealand on 17 August 2021 with all of New Zealand moving to Alert Level 4, and that by November 2021 Auckland was at Alert Level 3, Step 2, and the rest of New Zealand was at Alert Level 2. I repeat from earlier that Alert Level 2 allows for businesses to open and services to be provided as normal where this can be done safely. It also shows that this draft report is not consistent in its understanding of what alert level the country was at during the wave 23 surveys.
- d) The fact that Auckland was at a higher alert level than the rest of the country during the Wave 23 surveys is important because the more-locked-down Auckland region had 2-3 times the number of survey respondents than the other main centres, and the same number of respondents as the rest of the country combined outside the main centres. It follows that the Auckland responses, under Alert Level 3, Step 2 would skew the '*thoughts and feelings*' of respondents when considered nationwide.
- e) According to the graph presented on page 24 of the study report, 59% of respondents considered that that could easily get to the places they needed to go. According to the graphs presented on page 25 and 26 of the study report, 39% of respondents considered that that their daily travel routines were disrupted. Remembering that these graphs represent a nationwide summary, and noting that the highest group of respondents was from the more-locked-down Auckland area, it is reasonable to assume that a higher percentage of respondents from outside of Auckland would easily get to the places they needed to go and have less travel disruption. The report does not provide any sort of geographical data isolation in this manner apart from



providing some key findings for Wellington, and this places all other graphs provided in this report into question as to their validity for specifically considering the Canterbury situation.

- f) In the disclaimer, the NZTA specifically states that this study report is only a draft, it had not been independently reviewed, and the resulting findings should not be regarded as being the opinion, responsibility, or policy of Waka Kotahi or indeed of any NZ Government agency;

Overall, I could not find anything in the Waka Kotahi report that substantiates Mr Gregory’s suggested 20% adjustment to my surveyed traffic volumes. Mr Gregory’s evidence does not provide any substantiation for the 20% figure either.

32. In my opinion a far more accurate method to consider the likely effects of the Covid pandemic on road network volumes in the wider Rangiora area would be to consider the traffic volumes from the various continuous traffic count telemetry sites on the State Highway network to the north, east and south of Rangiora. This data is presented in Table SE1 and below Figure SE1 on the next page:

		2018	2019	2020	2021	2022
ID: 07100001	L State Highway 71 - Lineside Road Northwest of Kaiapoi	15116	15516	14643	15099	14987
ID: 01S00301	State Highway 1 - Leithfield, north of Kings Road	9776	10120	9449	10319	9840
ID: 01S00313	State Highway 1 - South of Waikuku township	12465	12891	12112	13345	13060
ID: 01S00316	State Highway 1 - At Woodend School	17399	17634	15440	19324	18632
ID: 01S00317	State Highway 1 - South of the Rangiora-Woodend Road junction	19902	18824	19412	20844	20228
ID: 01S00322	State Highway 1 - Northern motorway at the Smith Street overbridge	18279	19000	17804	19165	19724
ID: 01S00323	State Highway 1 - Kaiapoi Between SH71 and Ohoka Rd (northbound)	16374	15741	14658	16444	16794
ID: 01S00324	State Highway 1 - Kaiapoi Between Ohoka Rd Ramps (northbound)	15207	13680	12770	14953	15441

Table SE1: Annual average daily traffic volumes on the State Highway network surrounding Rangiora



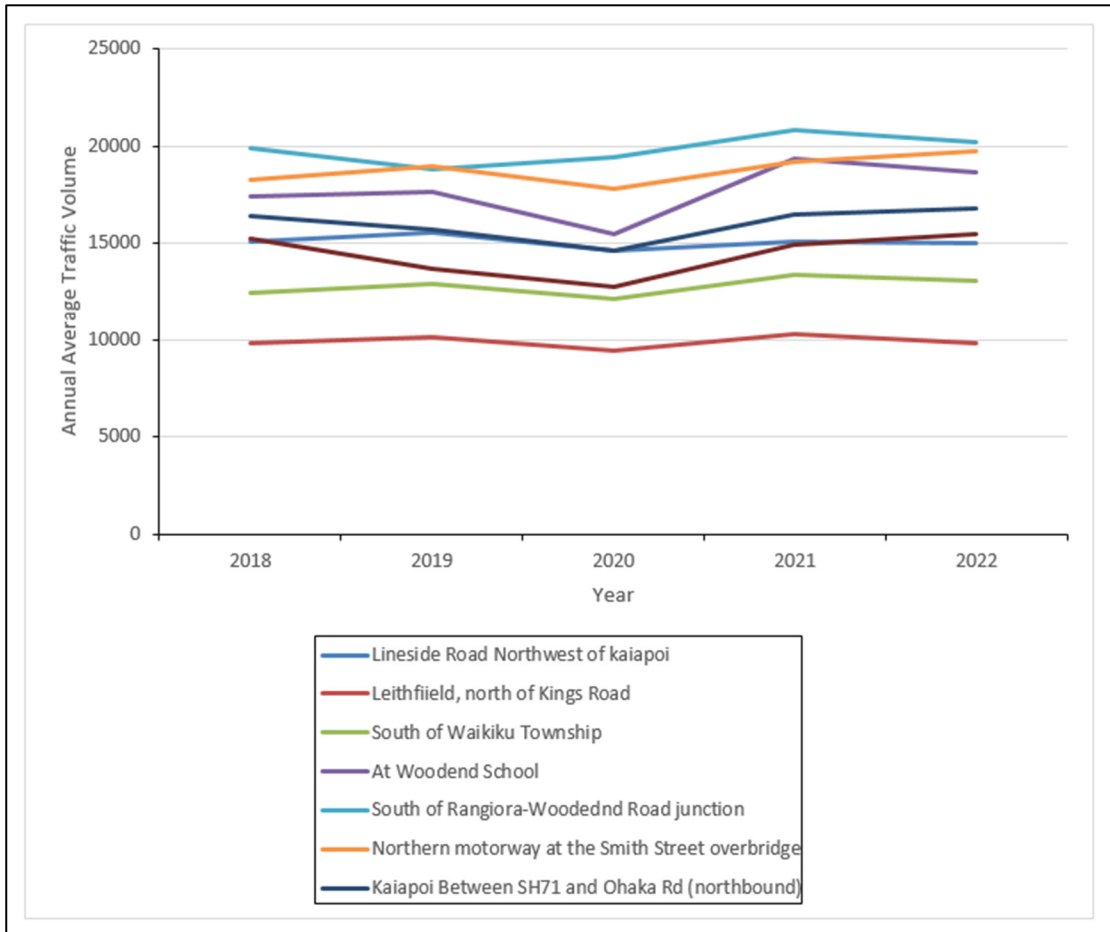


Figure SE1: Annual average daily traffic volumes on the State Highway network surrounding Rangiora (source =Waka Kotahi database).

33. This State Highway count data shows that, compared to pre-Covid times, the traffic count volumes in 2018 and 2019, the State Highway network were higher in 2021 and not lower as suggested by Mr Gregory.
34. In addition, I completed an additional weekday PM peak hour traffic count on Monday 26th February 2024 between 4:30pm and 5:30pm at the critical Lehmans/Oxford intersection and this data was presented in Table 9 of the March 2024 ITA. The ITA further stated that *“The surveyed intersection volume within the hour was 798 vehicles at the intersection. This is less than the 852 vehicles recorded in 2021 and confirms that traffic volumes have changed little in the 2021-2023 period”*.
35. The above analysis demonstrates that it is actually the Covid related commentary provided in paragraphs 59.1 and 60 to 62 of Mr Gregory’s evidence that is unreliable, and that Paragraphs 65 and



72 as well as Figure 4 of Mr Gregory’s evidence, where he has increased ambient traffic volumes by an unsubstantiated 20% to account for Covid influences is unnecessary.

Future Road Network Traffic Flows

- 36. I agree with Mr Gregory that Belmont Avenue is the critical road network link in the vicinity of the site to consider potential effects from site generated traffic because of this proposal. I refine this further to the section of Belmont Avenue between Sandown Boulevard and West Belt that is the critical link because Sandown Boulevard is the primary entry/exit point to the subject site to/from the east.

- 37. I noted earlier that Belmont Avenue, according to Council traffic count data from July 2019, carries around 1,050 vehicles per day at a location 50m west of West Belt. This volume would decrease slightly as one travels west along Belmont Avenue. As noted earlier, the lack of additional development since 2019 and the 2024 validation count undertaken in 2024 indicate that this traffic volume remains valid, and the additional 20% traffic volume applied by Mr Gregory to account for Covid influences is not appropriate.

- 38. Table 11 of my earlier ITA presented my estimates of future traffic volumes with a 110 allotment yield from the subject site. This is repeated below.

Network Link	Road Classification	Existing Volume (vpd)	Estimated Future Volume (vpd)	Change
Lehmans Road	Arterial / Local	1610	2030	+420
Huntington Drive	Collector	1500	1620	+120
Charles Upham Drive	Collector	1500	1620	+120
Sandown Boulevard	Collector	500	1040	+540
Belmont Avenue	Collector	1092	1632	+540
Kingsbury Avenue	Collector	1500	1920	+420
West Belt (north of High St)	Collector	6449	6749	+300
West Belt (north of Seddon)	Collector	3327	3687	+360
Oxford Road (west of Lehmans)	Strategic	5823	5943	+120
Oxford Road (east of Lehmans)	Strategic	6519	6579	+60

March 2024 ITA Table 11: Estimated future traffic volumes for weekday daily trips generated by the subject site based on a 110 dwelling yield at 10.9 trips per dwelling per day.



39. I update the information in the above table to reflect Mr Gregory’s adopted rate of 8.2 trips per dwelling unit per day is applied to 174 dwelling units as shown in Table SE2 below. For Belmont Avenue, the sensitivity test using Mr Gregory’s methodology adds a further 103 vehicles per day to Belmont Avenue. The estimated future daily traffic volume of 1,735 vehicles per day is in the range of that suggested in Mr Gregory’s Figure 4.

Network Link	Road Classification	Existing Daily Volume (vpd)	Estimated Future Daily Volume (vpd)	Daily Change
Lehmans Road	Arterial / Local	1610	2110	+500
Huntington Drive	Collector	1500	1643	+143
Charles Upham Drive	Collector	1500	1643	+143
Sandown Boulevard	Collector	500	1143	+643
Belmont Avenue	Collector	1092	1735	+643
Kingsbury Avenue	Collector	1500	500	+500
West Belt (north of High St)	Collector	6449	6806	+357
West Belt (north of Seddon)	Collector	3327	3755	+428
Oxford Road (west of Lehmans)	Strategic	5823	5966	+143
Oxford Road (east of Lehmans)	Strategic	6519	6590	+71

Table SE2: Estimated future traffic volumes for weekday daily trips generated by the subject site based on a 174 dwelling yield at 8.2 trips per dwelling per day.

40. The additional daily traffic volumes on all roads in the vicinity of the subject site are small. They are likely to have the greatest network capacity and residential amenity effect during the weekday peak hour periods. Table SE3, on the next page, presents the estimated changes in weekday peak hour traffic volumes on the roads presented in Table SE1 updated to a 174-allotment yield. Table SE3 on the next page shows that the proposal is estimated to place around one additional vehicle per minute on the various road network links in the vicinity of the site. This change in traffic flow would be very difficult to detect.



Network Link	Road Classification	Existing Peak Hour Volume (vpd)	Estimated Future Peak Hour Volume (vpd)	Daily Change
Lehmans Road	Arterial / Local	163	218	55
Huntington Drive	Collector	150	166	16
Charles Upham Drive	Collector	150	166	16
Sandown Boulevard	Collector	50	121	71
Belmont Avenue	Collector	107	178	71
Kingsbury Avenue	Collector	150	55	55
West Belt (north of High St)	Collector	614	653	39
West Belt (north of Seddon)	Collector	352	399	47
Oxford Road (west of Lehmans)	Strategic	551	567	16
Oxford Road (east of Lehmans)	Strategic	587	595	8

Table SE3: Estimated future traffic volumes for weekday peak hour trips generated by the subject site based on a 174 dwelling yield at 8.2 trips per dwelling per day.

Planned Function of the Road Network

Road Network Hierarchy

41. ITA Table 11 and Table SE1 above both list the classification of the roads in the vicinity of the site as identified in the proposed District Plan. This was also shown in Figure 5a of the March 2024 ITA. A closeup view of this is provided in Figure SE2 on the next page. It is critical to note from Figure SE2 that the Council proposes that Belmont Avenue, Sandown Avenue, Huntington Drive and Chatsworth Avenue to all be classified as collector roads. These are defined in the proposed District Plan as being:

“Any road identified as a collector road in the District Plan road hierarchy, and are roads that collect and distribute traffic between neighbourhoods and arterial roads, are a preferred route for travel within and between areas of population and activities, act as 'spine' roads, and provide a significant property access function.” (my emphasis)

42. Figure SE2 also shows that Mr Gregory’s opinion, in his paragraph 76, that there is a lack of a collector road access servicing the site from the east, is incorrect. The site is very well serviced by roads identified in the proposed plan as proposed collector roads to the east.



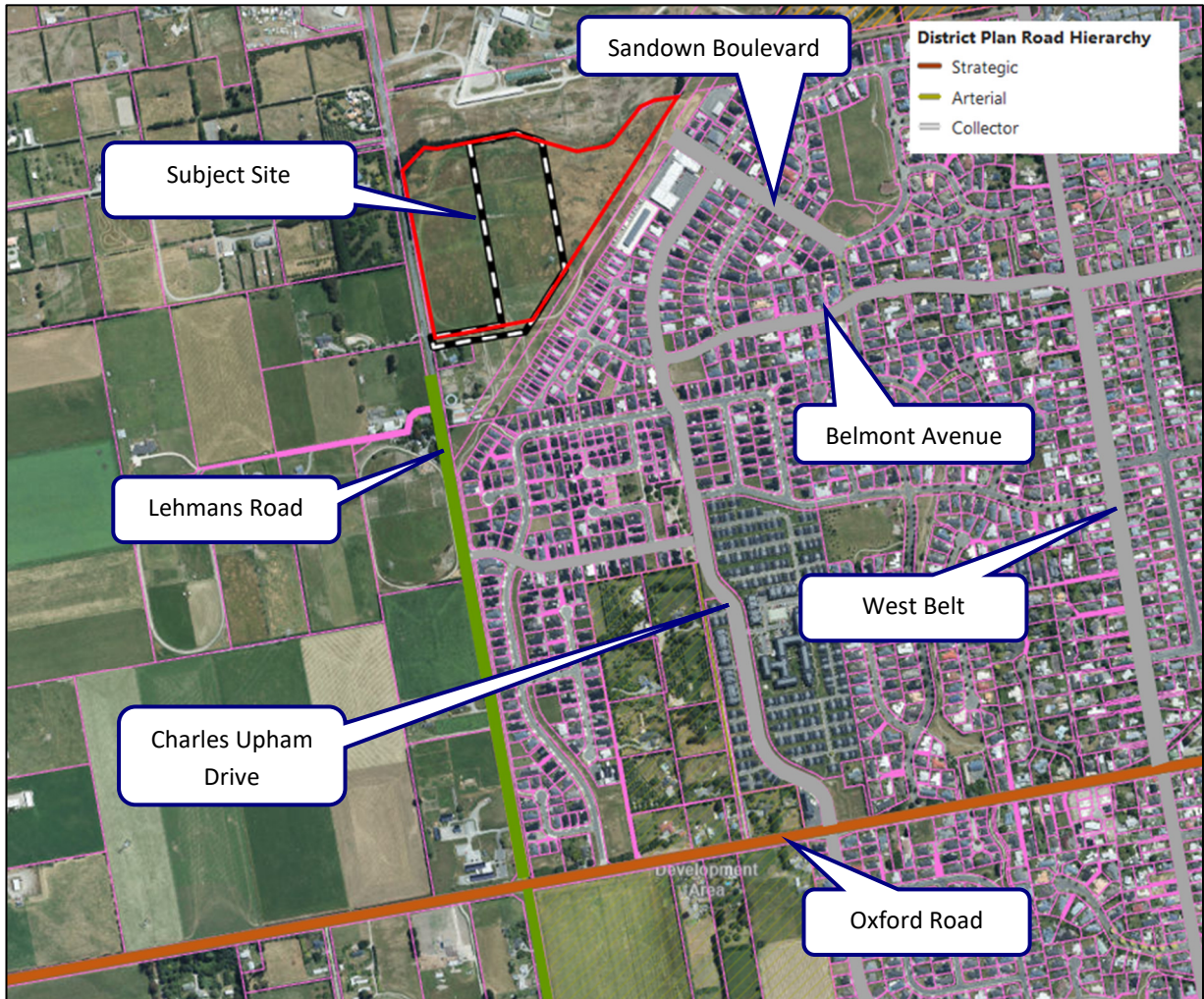


Figure SE2: Proposed Waimakariri District Plan road hierarchy in the vicinity of the subject site (shown in red). The proposed District Plan collector road network in the vicinity of the site is shown in grey.

43. What is not clear is why Oakwood Drive, between Sandown Boulevard and Belmont Avenue retains a local road classification. Mr Gregory also questions this in his paragraph 55. The local road classification is illogical as it leaves the collector route of Sandown Boulevard without a logical southeastern connection. This is a change needed to the proposed District Plan that is beyond the scope of the Doncaster submission.

Planned Traffic Volumes

44. Proposed District Plan Standard TRAN-S1 does not specify a design traffic volume envelope for an urban collector road, although a local road is specified as carrying up to 1,500 vehicles per day. It follows that the predicted future traffic volumes along the various proposed collector routes, as shown in Table SE1 earlier, are at the lower end of what the proposed District Plan considers to be a suitable traffic volume for an urban collector road being only 500vpd above the local road upper limit.
45. This in turn means that the commentary provided by Mr Gregory in his paragraphs 55, 56 and 57, where he discusses the formation standards of Oakwood Drive and Belmont Avenue as being more akin to a local road, are irrelevant as the Council has proposed collector road classifications for these roads as shown in Figure SE2 earlier. Mr Wilson's paragraph 344 also requires correction to list Belmont Avenue and Sandown Avenue as proposed collector roads because this submission is being considered within the framework of the proposed District Plan.
46. Further, NZS4404:2010 'Land Development and Subdivision Infrastructure' requires suburban 'live and play' roads¹ carrying up to 2,000 vehicles per day, such as the traffic volume predicted to occur on Belmont Avenue, Sandown Avenue, Huntington Drive, Charles Upham Drive and Kingsbury Avenue, to have a carriageway width of 5.5-5.7 metres which is already supplied on all these roads. Therefore, these roads, even with their existing traffic calming measures, can carry predicted future traffic volumes.
47. I add that in recent times it has become increasingly common for Council to impose traffic control devices on much higher volume collector and arterial roads in efforts to improve road safety through controlling vehicle speeds.
48. What all of this means is that Mr Gregory's comment in his paragraph 57 that there are "*limited opportunities within the existing network to provide for collector road requirements in order to appropriately connect the site to the surrounding town*" is not only incorrect, it also ignores current traffic engineering design practice. A road network of a suitable design standard to cater for traffic generated by the proposal is already in place.

¹ NZS4404:2010 road classification E12



Environmental Capacity

49. This leaves the issue of the environmental capacity of the surrounding road network as raised by Mr Gregory in his paragraph 63. He refers to 2009 research by Christchurch based transport planners Rhys Chesterman and Glen Koorey titled 'Assessing the Environmental Capacity of Local Residential Streets' on this matter. Mr Gregory may not be aware that this report was prepared at my suggestion as part of Mr Chesterman's masters qualification on transportation planning. I suggested this research to Mr Chesterman because, in agreement with Mr Gregory's paragraph 64, environmental capacity is not an exact science. Mr Chesterman concluded that a suitable environmental capacity for a residential street was between 1,500 and 2,000 vehicles per day.
50. Mr Gregory does not refer to a later 2012 report by Andrew Leckie titled 'Environmental Capacity of Local Streets with Street Treatments'. I quote from the abstract to this report that

This study looked at further Christchurch streets, this time with street treatments, such as street calming and tree plantings, aiming to find an environmental capacity for these streets as well as seeing whether the street treatments affected the perceived environmental capacity. As well as reinforcing most of the conclusions found by Chesterman, a higher environmental capacity of around 2,000 vehicles per day was found for the surveyed streets. This suggests that indeed, street treatments such as those used in the surveyed streets can increase the environmental capacity, which has implications for local councils who want to maintain road traffic carrying capabilities without having unsatisfied residents.

51. I note that the predicted future traffic volumes on the key streets identified in Table SE2 earlier is within this 1,500-2,000 vehicles per day range as being 'amenity acceptable' identified in the above research documents. This undermines Mr Gregory's opinion, in his paragraph 72 that the proposal "could potentially noticeably change amenity within the surrounding road network". This is highlighted in my peak hour volume analysis presented in Table SE3 earlier. I repeat that around one additional vehicle per minute on the various road network links in the vicinity of the site would be very difficult to detect.



Direct Site Access to the Northwest Rangiora Bypass

52. Section 3.3 of the March 2024 ITA discussed the Council proposal to create a heavy vehicle bypass around the western side of Rangiora. The intention is to connect Lehmans Road with River Road and thus complete an arterial ring-road connection between Southbrook and Loburn. It is anticipated that this by pass will attract vehicles, and particularly heavy vehicles, away from the current use of Townshend Road and West Belt as a route bypassing the Rangiora CBD. This project is identified in the Council's Draft Infrastructure Strategy 2021 – 2051 with \$2.2 million of funding allocated in the 2030-2031 financial years.
53. Mr Gregory, in his paragraph 74, considers that direct allotment access to this bypass should be restricted. He then changes this to a position of access being prohibited in his paragraph 81.4. While I agree that direct allotment access to this bypass route should be minimised, this will likely result in an increased number of back sections which Mr Gregory seeks to avoid in his paragraphs 17.1 and 17.2. In my opinion the safety benefits of not having direct allotment access to a high volume road expected to carry heavy goods vehicles far outweigh any claimed safety concerns with the operation of driveways to rear sections. In my opinion there will be nothing unique about the proposed bypass route that precludes it from having the same proposed District Plan site access requirements as for other arterial roads where there are tougher standards in relation to driveway numbers, driveway separation distances and intersection setbacks. I do not consider a site specific rule is necessary as suggested by Mr Wilson in his paragraph 350.

Provision for Alternate Travel Modes

54. Section 3.7 of the March 2024 ITA discusses the cycle network in the vicinity of the subject site. It states that there are no dedicated cycle paths in the vicinity of the subject site apart from the *Rakahuri Trail* which is located to the north alongside the Ashley River. The ITA added that the existing subdivision located south of the site provides various connections to the shared path located along the eastern side of Lehmans Road, and that the other roads in the wider vicinity of the subject site are all sufficiently low volume that they can be readily used for cycling purposes.



55. Mr Wilson, in his paragraph 323, summarises the Waka Kotahi submission who consider that:

“...greenfield development within the Northwest Rangiora Development Area outside of the Projected Infrastructure Boundary is likely to encourage the use of private vehicle use, proposed pedestrian and cycle connections are limited and no public transport. They request to amend the Outline Development Plan to include better cycle and pedestrian connections.”

56. Mr Gregory, in his paragraphs 75 and 81.3, recommends that a walking/cycling path is shown on the ODP along Lehmans Road and the northwest arterial. I agree with providing a path along the bypass route, but refine this to be the provision of a shared path on the alignment of Parrott Road between Sandown Avenue and 28C Salisbury Avenue. There is no need to extend a shared path northeast of Sandown Avenue in the absence of any urban development of the neighbouring racecourse site (I have been advised by Counsel for Doncaster that there are no submissions seeking that the racecourse site is rezoned for urban development purposes). There is no need to provide an extension to the cycle path along Lehmans Road.

57. Figure SE3 on the next page shows where there are existing shared path connections in the immediate vicinity of the site and where I consider a proposed shared path should go. The key to Figure SE3 is:

- a) Existing cycle path network shown in black;
- b) Recommended shared path addition shown in red;
- c) Currently proposed collector road through the subject site (as shown on the ODP) shown in green, and;
- d) Balance of the heavy goods vehicle by pass proposed by the Council shown in yellow.

58. When the existing cycle network and my recommended shared path addition are considered in the context of the road hierarchy shown in Figure SE2 earlier (where local and collector roads are readily useable by cyclists as noted by Mr Wilson in his paragraph 344), the site is well connected to the balance of Rangiora. Further, the proposed east-west collector road shown in green in Figure SE2 would include provision for cyclists to collect internally generated cycle trip demand and transfer it to the black and red cycle connections shown in Figure SE2. The relief sought by Waka Kotahi is easily provided.



e)



Figure SE3: Existing marked cycleway network in the vicinity of the subject site (shown in black) with the recommended shared path addition shown in red.

Design Recommendations

59. In his paragraph 347, Mr Wilson distils the assessment of Mr Gregory into the following design recommendations:
- a) *Access management to avoid direct connections onto the arterials.* As stated earlier, there will be nothing unique about the proposed bypass route that precludes it from having the same proposed District Plan site access requirements as for other arterial roads;
 - b) *Avoid overloading the Arlington streets.* As shown in Tables SE1 and SE2 earlier, the proposal will not result in overloading of Arlington Streets. It is agreed that the most affected street is Belmont Avenue where, even in the 174 lot sensitivity test, traffic volumes remain below 2,000 vehicles per day which research suggests is an acceptable environment threshold. The fact that the Council proposed Belmont Avenue to be a collector road, with a design envelope much higher than 2,000 vehicles per day, reinforces this point.
 - c) *An additional access direct between Parrott Road and West Belt.* This access assignment is shown in Mr Wilson's Figure 23 alongside the northern edge of the Doncaster site, albeit located on the neighbouring racecourse land (along the central top edge of Figure SE2 earlier). I agree that such a connection is desirable if the racecourse land was developed for urban purposes however, because it is located north of the Doncaster site, there is no need for such a connection with the Doncaster proposal because there is no site generated transport desire line in this direction. Therefore, I disagree with Mr Wilson where he raises this as a design recommendation his paragraph 362.
60. In his paragraph 351, Mr Wilson raises the idea of an additional northeast to southeast road in the middle of the Doncaster site to reduce internal block sizes. While this can be dealt with under the discretion afforded to the Council via the subdivision consent process, I see no issue with updating the ODP to this effect. I understand that Doncaster is amenable to this.
61. Also in his paragraph 362, Mr Wilson recommended that Parrott Road is formed as part of the Doncaster proposal. I disagree. Referring to Figure SE2 earlier, this shows in light green a proposed east-west collector road between Sandown Avenue and Lehmans Road. There is no need to further form Parrott Road to provide a western site connection as a connection to Lehmans Rd is being made anyway. The balance of Parrott Road, shown in yellow in Figure SE2 earlier, is a council initiated bypass



project that is not required to mitigate the transport effects of the Doncaster proposal. Instead, my March 2024 ITA recommended that the 'green' section of the bypass be formed to an arterial road standard in anticipation of the Council completing the 'yellow' section of the bypass to an arterial standard in the future, so that a consistent construction standard is achieved along the bypass route. There is nothing in the evidence of Mr Gregory or the report of Mr Wilson that has altered my view on this.

62. Finally, in relation to Mr Wilson's paragraph 362 regarding provision for cyclists, I repeat that the proposed east-west collector road shown in green in Figure SE2 would include provision for cyclists to collect internally generated cycle trip demand and transfer it to the black and red cycle connections shown in Figure SE2, and that my recommended 'red' shared path in Figure SE2 provides the necessary connection to properly connect the site for alternate transport modes.
63. Noting all the above, my Section 7.0 of the March 2024 ITA provided a list of my design recommendations in relation to this proposal. These are repeated below:
- a) That the construction of Parrott Road, from Lehmans Road to Sandown Boulevard should be to an arterial road standard as shown on the proposed ODP for the site;
 - b) The junction of Parrott Road with Lehmans Road should be formed to provide priority to the arterial route, with the northern end of Lehmans Road forming a T-junction with a give way priority control against it as shown on the proposed ODP for the site;
 - c) The east-west connection between Sandown Boulevard and Lehmans Road should be to a local road standard as shown on the proposed ODP for the site;
 - d) The speed limit on Lehmans Road, between Oxford Road and Parrott Road be 50km/h;
 - e) The speed limit on Lehmans Road, between Parrott Road and the east-west connection between Sandown Boulevard and Lehmans Road be 50km/h;
 - f) The speed limit on all roads within the subject site be 50km/h;
 - g) The shared path connecting into 28C Salisbury Avenue be extended in a northeast direction to Sandown Boulevard, with connections to Helmore Street in two locations (as shown in Figure SE2);



- h) The proposed side road intersections with Parrott Road have give way controls against the side roads;
 - i) That a 'stop sign ahead' control be placed on Lehmans Road, north of Oxford Road.
64. Noting the comment made by Mr Gregory about changing speed limits requiring NZTA approval in his paragraph 78, which equally apply to give way controls and the like, my recommendations d) to f), h) and j) are matters beyond the scope of that can be included in a District Plan. If urban development was to proceed, then I do not foresee any issues with gaining such approval for reduced speed limits.

Conclusion

65. Having reviewed the evidence of Mr Gregory and the relevant sections of the report of Mr Wilson in detail, there is nothing in his evidence that changes the relevant parts of my conclusion that:
- a) The existing road network in the wider vicinity of the subject site has spare geometric capacity to cater for the increased traffic loading because of this proposal.
 - b) While the proposal will generate notably more traffic from the site than what could currently occur, the site is very well connected to the surrounding road network such that there are multiple route choices for site generated traffic.
 - c) Once site generated traffic is distributed across this network, the predicted changes to existing traffic volumes on key road network links and intersections will be minimal and readily accommodated.
 - d) The site is also well connected to the existing network for alternate transport modes.
66. Subject to my design recommendations detailed earlier, there is no valid traffic engineering reason to decline the relief sought by Doncaster.
67. I am happy to answer any questions.

