BEFORE INDEPENDENT HEARINGS COMMISSIONERS

UNDER	the Resource Management Act 1991 (RMA)
IN THE MATTER	of notices of requirement under section 168 of the RMA for the construction, operation, maintenance and improvement of approximately 11.5km of new State Highway between Ashhurst and Woodville.
BY	**NZ TRANSPORT AGENCY** Requiring Authority

ADDENDUM TO EVIDENCE OF SHANE ANDREW VULETICH FOR PALMERSTON NORTH CITY COUNCIL

1 April 2019

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1. INTRODUCTION

1.1 My full name is Shane Andrew Vuletich.

1.2 I submitted a statement of expert evidence on behalf of Palmerston North City Council dated 15 March 2019 (my 'original evidence').

1.3 I have the qualifications and experience set out in my original evidence.

1.4 I repeat the confirmation given in my original evidence that I have read the Code of Conduct for expert witnesses and that my evidence has been prepared in compliance with that Code.

1.5 In this addendum I respond to points made in the 25 March 2019 expert evidence addendum of David Dunlop on behalf of the New Zealand Transport Agency (**NZTA**).

2. RESPONSE TO COMMENTS MADE BY DAVID DUNLOP

2.1 In my original evidence I presented a range of estimated economic benefits that would be expected to result from the development of a dedicated walking and cycling facility along the length of the project route. The modelled benefits, which are summarised in Table 1, were assessed relative to a 2.0-metre-wide shoulder as the counterfactual.

Table 1: Difference in value between separate path and 2 metre shoulder, by benefit type (present value over 20 years)

	On Highway	Off-Highway Low	Off-Highway Medium	Off-Highway High
Health	$1,013,370	$3,518,555	$4,825,327	$6,132,100
Safety	$1,879,892	$4,527,435	$5,992,686	$7,457,937
Consumer surplus	$415,813	$1,398,778	$1,900,188	$2,401,597
Tourism	$1,308,014	$4,797,991	$6,515,629	$8,233,267
TOTAL	**$4,617,089**	**$14,242,759**	**$19,233,830**	**$24,224,901**

2.2 Among other benefit types, the model estimates the safety benefits that would be achieved as a result of the separation that a dedicated path would provide between walkers/cyclists and motor vehicles. This category of benefits ranges from approximately $1.9m over 20 years for an 'on-highway' separate path to $6m over 20 years for an 'off-highway' separate path (medium scenario).

2.3 In paragraphs 40-41 of his evidence addendum, NZTA transport expert David Dunlop makes the following comments regarding the crash risk assumptions that I used to estimate the safety impacts of building a 2.0 metre shoulder:

> "40. Mr Vuletich has adopted a factor of 92% (i.e. 8% better than average) to estimate the crash reduction factor associated with a 2m shoulder compared to the average state highway. Mr Vuletich has then applied that factor to the rate (30.0) of deaths / injuries per million kilometres travelled for cyclists on Page 9 all road types to calculate the expected crash rate on the proposed Project (27.6). I am unable to find the document referred to by Mr Vuletich but note that the crash rate of 30.0 seems to be the same as that found in Figure 1 of the Cycling Crash Fact Sheet prepared in 2017 by the Ministry of Transport. That figure (30.0) is for all road types urban / rural / State highway / local roads.
>
> 41. I note the figure comparing cyclist crashes by shoulder width referred to above noted that the vast majority of cycle crashes that occur on rural roads occur on roads with a shoulder width of 1m or less. It is also unclear whether Mr Vuletich's factor of 92% (i.e. 8% better than average) has taken this into account in his calculations. I consider that a 2.0m wide shoulder is significantly more than 8% better than the average State highway."

2.4 I confirm that I took the information cited by Mr. Dunlop into account when modelling safety impacts. Specifically, I used this information to estimate the risk of an injury crash between cyclists and motor vehicles on the project route with 2.0 metre shoulder (the counterfactual in my model), as outlined below:

(a) I started with the average risk of deaths and injuries per million hours travelled across <u>all road types</u>, as reported in the NZTA Cyclist Crash Fact Sheet cited by Mr. Dunlop. The relevant risk factors are:

(i) 30 deaths and injuries per million hours travelled for cyclists; and

(ii) 5 deaths and injuries per million hours travelled for pedestrians.

(b) I assumed that the above risk levels would be reasonable proxies for the risk of death/injury on the project route with a hypothetical <u>0.9m</u>

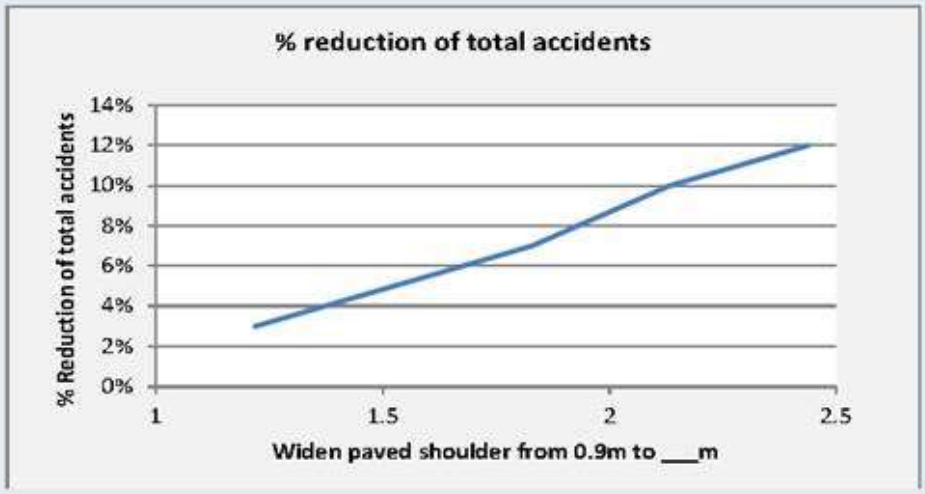
shoulder. I consider the application of average risk factors (calculated across all road types) to the project route, which is a rural state highway, to be reasonable since the new highway will share some attributes of urban roads given its high traffic volumes.

(c) I then assumed that the risk of death/injury on the new state highway with a 2.0m shoulder would be 92% of the risk of death/injury on the hypothetical project route with 0.9 metre shoulder from above. This assumption is based on section E3.2 of NZTA's High Risk Rural Roads Guide (2011) which shows that widening a shoulder from 0.9 metres to 2.0 metres reduces total accidents by around 8%. The relevant figure from page 111 of the NZTA guide is pasted below:

Crash reduction

The greatest benefits are provided by the first 0.8 metres of sealed shoulder (30%). Increases to widths above 1 metre provide less value as shown in the figure below

- 25% casualty reduction for widening shoulder to less than 1.2m [60]
- 35% reduction of casualty crashes for widening sealed shoulder to greater than 1.2m [60]
- 30% reduction of casualty crashes for shoulder sealing [60]
- Seal 1m shoulder (rural) [103]
- 22% reduction of property damage crashes, 19% reduction in total crashes and 14% reduction of fatal, serious and minor injury accidents [103]



(d) Based on the above, the risk factors for the project route with 2.0 metre shoulder are estimated as:

(i) 30 x 92% = 27.6 deaths/injuries per million hours for cyclists; and

(ii) 5 x 92% = 4.6 deaths/injuries per million hours for walkers.

(e) The NZTA High Risk Rural Roads Guide referenced above indicates that the largest safety benefit from shoulder widening occurs in the first 0.8-1.0 metres of shoulder width. As noted, the pasted figure shows that widening a shoulder from 0.9 metres to 2.0 metres reduces total accidents by approximately 8%. Note that the figure relates to total accidents across all road users (including motor vehicles, cyclists, etc.) and is expected to be representative of the impacts of shoulder widening on cyclists and pedestrian crashes.

(f) The risk factors derived in (d) were used to estimate the number of deaths and injuries expected to result from clashes between cyclists/pedestrians and motor vehicles on the project route with a 2.0 metre shoulder, to inform the counterfactual in my model.

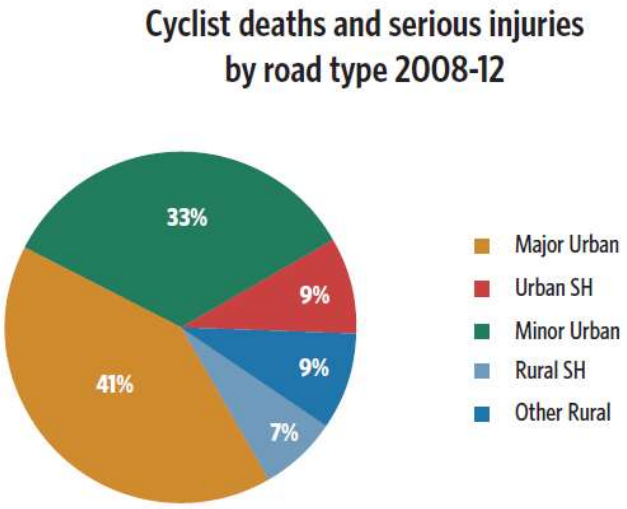
2.5 Mr Dunlop notes further in paragraph 42 of his addendum:

> "42. I do not consider that it is appropriate to apply the crash rate (30.0) for all road types to the calculation of an expected crash rate for the Project. The above document and the Safer Journeys for People Who Cycle: Cycling Safety Panel Final Report and Recommendations, December 2014 note that the proportion of cyclist deaths and serious injuries on rural State highways is 9% of all road types. I cannot replicate Mr Vuletich's calculations, but it appears he may not have taken this into account in his calculations."

2.6 In preparing my evidence I reviewed the section of Safer Journeys for People Who Cycle referenced by Mr. Dunlop. I did not use the 9% figure he cites as an input to my risk calculations because it was not easily translated into a risk factor.

2.7 The 9% figure cited by Mr. Dunlop, which I believe was taken from the chart pasted below (found on page 10 of the Safer Journeys report), represents the number of cyclist deaths and serious injuries that occur on rural state highways as a proportion of all deaths and serious injuries that occur across all road types. This proportion is in part dependent on the relative usage of rural state highways by cyclists compared to the usage of other road types by cyclists. If urban routes are more heavily used by cyclists than rural routes, one would expect to see a higher proportion of crashes on urban routes than on rural routes, all else being equal. Without seeing the data expressed as a rate (e.g. the number of crashes

on road type X per million hours travelled by cyclists on road type X), it cannot be assumed based on this data that rural roads are safer.



2.8 Based on all of the above, I consider that the assumptions and conclusions made in my original evidence are still appropriate.

Shane Vuletich
1 April 2019