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Consulting Advice Note

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Date	7 October 2024
From	Jon Styles
To	Mithran Gopinath
Project	PC29 – State Highway Noise Controls
Re	**Advice to inform Council reply**

Nelson City Council has engaged Styles Group to provide acoustics advice on three issues to inform the right of reply to the PC29 Hearing Commissioners.

The three issues and my responses are set out below.

Issue 1 – Health effects from exposure to road-traffic noise

The Issue: I understand that Mr Witte advised the panel that no evidence has been provided on the health effects of exposure to traffic noise. He points to NZTA's submission which states, "*Noise generated by state highway traffic can adversely affect the health and wellbeing of people and communities. This is a position supported by the World Health Organisation and Waka Kotahi Research Report 292*". Mr Witte states that this is an engineering report and that it is not about health effects but rather the report shows that road surfacing, sealing and traffic speed are the determinants for the noise.

The Question: Nelson City Council has asked me to confirm whether the documents referred to in my evidence are exhaustive or whether there are any documents that should be referred to.

The Response: My evidence refers to the following documents:

- WHO Regional Office for Europe (2012). Methodological guidance for estimating the burden of disease from environmental noise. Copenhagen,
- WHO Regional Office for Europe (2011). Burden of disease from environmental noise: quantification of healthy life years lost in Europe. Copenhagen,
- Conclusion - WHO Regional Office for Europe (2011). Burden of disease from environmental noise: quantification of healthy life years lost in Europe. Copenhagen,
- Research Report 656, Waka Kotahi, Evidential basis for community response to land transport noise, Published: June 2019

- https://www.euro.who.int/ data/assets/pdf_file/0008/383921/noise-guidelines-eng.pdf
- Burden of Disease from Environmental Noise. Copenhagen, WHO Regional Office for Europe, 2011 https://www.who.int/publications/i/item/9789289002295

This list of references is certainly not exhaustive. There are a significant number of reports and studies available worldwide that demonstrate the adverse health effects arising from exposure to noise from transport infrastructure.

Section 5 of my evidence in chief sets out my assessment of the adverse health effects. At paragraph 5.2 of my evidence, I refer to guidance from the WHO that estimates that at least one million healthy life years are lost as a result of exposure to transportation noise every year in Western Europe alone.

I consider that it is incontrovertible that potentially significant adverse health effects can arise from exposure to high levels of noise from road transport, and to well below some of the highest levels that will be experienced near to roads in Nelson. I consider that this is strong evidence to support the proposed rules.

Issue 2 Change in noise contours

The Issue:	Mr Witte is concerned that the current government has recently consulted on increasing traffic speed limits and queries whether the noise contour will need to be adjusted, and a variation or plan change undertaken if the Queen Elizabeth 2 Drive and Atawhai Drive section of SH6 reverts to 100km/hr as it was prior to December 2020.
The Question:	Nelson City Council have requested information relating to any flexibility that is built into the noise contours.
The Response:	The contours have been calculated using traffic flow data, speed environment data and other variables that are current or recent. It is not possible to create contours that are reliable for the future as there are too many unknowns and variables that cannot be accurately forecast. These include road surfaces, speed environments, distribution of heavy vehicles and the general fleet mix. However, it is possible to build in an allowance for these variables by requiring and design of the noise sensitive activity captured by the controls to be based on current traffic noise levels and adding 3dB. The additional 3dB is designed to account for uncertainties in the variables listed above, (and some technical uncertainties). 3dB is a small increase when considering the building insulation process and is unlikely to make any appreciable change in the overall cost. The possible variations could be as follows:

- Change in speed from 80kph to 100kph +1-2dB
- Increase in traffic flow of 50% +1.7dB
- Change in chipseal (1-2 grades) +1-3dB

My experience is that these variations typically occur occasionally and are generally isolated. This means that adding 3dB to the design is generally sufficient to cater for most change scenarios.

I have worked with various road controlling authorities to try and either minimise these uncertainties or find ways of incorporating them into rules managing land use next to major roads. The methods proposed in Plan Change 29 represent the best current practice.

Unfortunately, the proposed rules are not perfect, and will not automatically adjust the contour or design requirements for all possible changes in the traffic noise levels. The proposed rules will also not be able to 'shrink' the contours or design requirements if there is a change that reduces the noise emissions and extent of land affected.

However, I consider that the proposed rules will be workable and appropriate for the majority of situations where it will apply, and in situations where it is not quite right, I expect that the margin of uncertainty will be small and either of little consequence or low cost.

I expect that only major changes to the road would require an update to the contours via plan change or other process. This might include adding additional lanes, structures, changing the alignment or adding (or removing) bypasses or other roads that could significantly affect traffic flows elsewhere. Traffic flows would need to double or halve to change the noise levels by +3dB or -3dB respectively.

Issue 3 Acoustic fencing to determine compliance with the rule

The Issue:

As notified, PC29 proposes acoustic insulation requirements for any new or altered residential activity within 100m of the State Highway. The plan change reduced this requirement to 40m where there is a solid structure or landform blocking the line of sight.

Mr Witte states: Should a property owner choose the acoustic fence option the first issue they face is that the proposed rule (REr43A) applies only to "*an existing solid and continuous building, fence (or) wall… that blocks the line of sight from all parts of doors and windows to the new or altered habitable spaces to any part of the road surface of the state highway*". My summary statement of evidence (presented at the hearing) agrees with Mr Witte - that the word "existing" is problematic and considers that the word "permanent" may be a better option.

I understand that there are fence rules (REr.17I, REr.18I & REr.31) that state that any fence within 4m of a road boundary either needs to be less than 1.2m in

height or visually permeable. These rules are aimed at managing the effects and attractiveness of the street.

Mr Witte finds that if a person chooses a solid structure route (to comply with State Highway noise provisions), they will need to apply for a resource consent to infringe the fence rule (if they are within 4m of a road boundary).

The Question: Nelson City Council have asked me to provide comment on the issue raised by Mr Witte.

The Response: I clearly understand the apparent conflict between the proposed State Highway noise controls and the limitations on permitted fence heights.

However, road noise effects can be mitigated by a range of measures that do not include fencing. These include upgrades to the building envelope itself, designing a building or alteration so it is not exposed to road noise, and / or if that is not practicable, to ensure that windows are facing away from the road or at least perpendicular to it or utilising screening from other buildings or topography.

I consider that the apparent conflict between the rules is unfortunate, but it certainly does not mean that the State Highway noise controls become unworkable. In contrast, I consider that there are many options available to mitigate road noise, beyond fences.

Please contact me if you require any further information.

Yours sincerely,



Jon Styles, MASNZ
Director and Principal