

## 1 MacKays to Peka Peka Expressway

### Noise, vibration and air quality management

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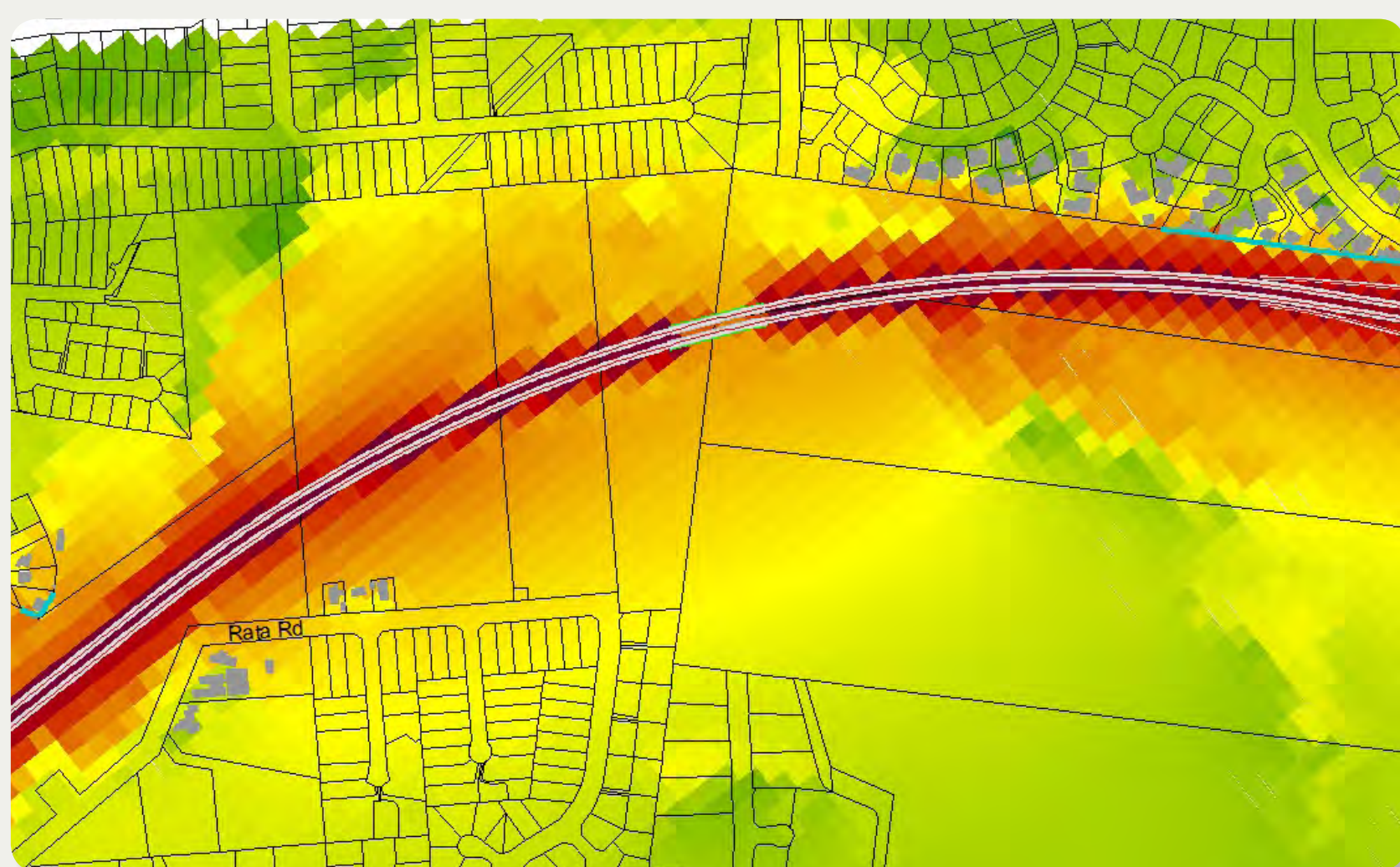
The need to consider noise, vibration and air quality in the design of the expressway is extremely important. In addition to meeting national standards and guidelines, internationally recognised best practice measures are being followed to reduce noise and vibration, and to maintain air quality for nearby premises and facilities.

#### Noise management

The noise mitigation methods contained in New Zealand Standard NZS 6808:2010 Acoustics will be followed.

Typical noise sources from traffic on the expressway are vehicle tyres on the road surface and engines. Construction noise will also occur and is addressed on the Construction panel.

Noise monitoring is being undertaken to understand what the noise levels are in the area now, before the expressway is built.



Noise modelling shows the areas near the expressway where a high increase in noise levels may occur (red). Low increases in noise levels are also shown (orange to yellow to green). Noise mitigation will be designed to achieve the lowest practicable level of noise near houses as described on this panel.

Some parts of the route will be near residential areas. A different approach to manage any noise from the expressway will be followed where the land use requires a more sensitive approach.

To meet the standard (and to reduce noise levels below it where possible) the expressway design will use the following approaches:

- considering the alignment of the expressway to avoid as many sensitive receptors as practicable
- maintaining a buffer space between the expressway and the sensitive receptors
- using smooth asphalt surfaces that reduce the noise generated by tyres on the road
- positioning noise barriers and bunds (earth mounds) to obstruct the noise transmission to sensitive receptors.



Example of a planted bund to provide a barrier to noise.



Example of a noise barrier in the form of a wall.

#### Air quality

The quality of air near the expressway is a major concern for many people. Taking into account future traffic volumes, we anticipate that the width of the expressway corridor is sufficient to ensure that there will be no adverse effects.

The extent of any adverse health effects depends on the volume of traffic on the expressway, the degree of congestion, and the proximity of the expressway to houses and people.

The effects of vehicle exhaust emissions from the expressway have to be considered in the context of existing pollution sources (such as domestic fires). All combustion sources discharge similar types of contaminants, and the contaminants from all sources have to be combined to assess the overall effects of the expressway. National Environmental Standards and national and regional Ambient Air Quality Guidelines are used to assess any adverse effects of exhaust emissions.

We have set up a monitoring station on Raumati Road, to measure the existing air quality. This station will operate for a year, however we will have enough information to support a basic air quality assessment by August 2011.



Air quality monitoring station on Raumati Road

#### Vibration

Heavy vehicles can generate vibrations that travel through the ground to nearby buildings. In some cases this may be felt by people in those buildings. Vibration levels are lower the further away the building is from the source.

During construction, higher vibration levels may occur, the Construction panel describes how this will be managed.

Monitoring of vibrations that currently occur is being undertaken, and the ground conditions studied.

An appropriate separation distance from the expressway to buildings will be determined as a buffer to vibration, and the design will reflect this.

Design approaches to manage vibration may include:

- using smooth asphalt surfaces that reduce the vibration generated by trucks on the road
- maintaining a suitable buffer distance between the expressway and buildings
- using subsurface structures to lessen the transfer of vibration.