

# Traffic flows and noise levels

## Additional information and FAQs

24 November 2022

On behalf of Waka Kotahi NZ Transport Agency, City Edge Alliance has finished noise monitoring for the Hamilton section of the Waikato Expressway.

The commissioning report by Marshall Day Acoustics is attached (Hamilton Noise Monitoring Report Nov 2022) and on the Hamilton section website from 25 November – [www.nzta.govt.nz/hamilton](http://www.nzta.govt.nz/hamilton) under the Noise Mitigation tab

The report shows that right now, traffic noise on the Hamilton section complies with the consent limits/designation conditions along the whole route.

But while this new section of State Highway 1 is working well, traffic flows are greater than expected. More traffic on the expressway does mean more noise, but to a lesser degree than most people expect (*see FAQs following*).

When we design a new road, we make projections for how many vehicles will use the road up to the project's 10-year design year, which for Hamilton section is 2031.

Given the traffic is higher than expected, City Edge Alliance now needs to recalculate future traffic growth to predict what the noise levels could be in design year 2031. They may be higher than they are now – perhaps 1 dB or so (*see FAQs*). An increase in noise, even a small one, may mean that extra noise mitigation is needed in some areas for the new highway to remain compliant. The new modelling is expected to be completed by March 2023.

Noise from the new road may be especially noticeable in semi-rural areas that previously had little traffic noise and some home-owners along the expressway may be struggling with the change in their noise environment.

The report confirmed the noise levels along the expressway are currently within acceptable limits.

If you have any queries, please contact Hamilton section project team on [waikatoexpressway@nzta.govt.nz](mailto:waikatoexpressway@nzta.govt.nz)

## Frequently Asked Questions

### **Q: How will increased traffic flows affect the noise levels?**

A: Sound is measured in decibels on what is called a logarithmic scale. This scale doesn't increase in a linear way as you might expect. If the source of noise is doubled then this results in a 3 dB increase. So if the expressway had twice the traffic it would generate noise levels 3 dB higher.

State highway traffic typically increases around 3 per cent per year (non-compounding). 2031 is around eight years away so (all other things being equal) traffic flows could be

about 24 per cent higher in 2031 than they are today. A 24 per cent increase in traffic flow would likely equal around 1 dB (remembering that a 100 per cent increase would equal 3 dB).

**Q: What does an increase of 1 dB sound like?**

A: At a technical level an increase of 1 dB is typically imperceptible to most people. For reference, a 3 dB change (from a doubling/halving of traffic flow) is typically “just perceptible”.

**Q Why focus on 2031?**

A: State highways are designed to meet noise limits at their design year, which is 10 years after the highway opens. Hamilton section was scheduled to open in 2021, so the design year was set at 2031.

**Q: What happens if the 2031 road noise is not within consent limits?**

A: Waka Kotahi would need to do further mitigation work to bring the noise level down to compliant levels.

**Q: Why does Waka Kotahi need to model and monitor noise levels from a new road?**

A: Road noise must not exceed noise limits which are set in our consents with Hamilton City and Waikato District councils.

**Q: How were the monitoring sites selected?**

A: Back when the project started in 2016, 14 sites along the alignment were selected for ambient noise monitoring. They were chosen on their proximity to the alignment, and to ensure a good spread of locations and receivers (eg suburban and rural) along the whole route.

When choosing the 17 sites for compliance monitoring this year, the first locations selected were those with a non-compliance risk (where mitigation had been installed). Then the original ambient monitoring sites from 2016 were reviewed to expand the coverage and number of sites to 17.

Because these 17 sites are considered most likely to be impacted in terms of proximity and noise level, complying with the noise limits there means that all other dwellings further away are expected to comply too.

**Q: How do you know what noise I receive if you didn't measure at my house?**

A: There is a noise model of the entire alignment. It includes all dwellings within 200 metres of the expressway that existed before consent was granted. (Any houses established since that time were built with knowledge of the expressway and noise mitigation would have been put in place by the owner).

The model was calibrated to the 2016 measurements and adjusted to ensure that predictions of expressway noise at all other dwellings were accurate. So, if noise wasn't

measured at your house, there will be a house nearby where it was. The model accurately calculates your noise level compared to theirs.

**Q How long was monitoring conducted at each property?**

The equipment captured an average 24-hour noise level. The monitoring equipment was often left for several days at each site where practical.

**Q: Does the model predict engine-braking trucks, boy racers or rumble strips?**

A: No. At expressway speeds, practically all noise comes from the road-to-tyre interaction, and this is what the model predicts. The model predicts long-term noise levels from traffic as a whole, not individual vehicles. Individual trucks and cars with loud exhausts can be identified through the warrant of fitness programme or by the NZ Police.

Driver behaviour can also affect the amount of noise generated by individual vehicles but cannot be modelled.

Noise from audio-tactile profile (ATP, known as rumble strips) is difficult to predict because it relies on driver behaviour. For this project, ATP wasn't placed within 200m of any dwelling. This decision was a careful balance between controlling noise and ensuring safety on the road.

**Q: When did Waka Kotahi complete the noise report?**

A: The Waka Kotahi independent acoustic consultants (Marshall Day Acoustics) monitored traffic noise levels at 17 locations between August and October 2022. Refer to their compliance report, dated November 2022.

**Q: Where is the report?**

A: City Edge Alliance, which built the Hamilton section, has completed noise compliance reporting (as required by the conditions), and it has been sent to Waikato District and Hamilton City councils. It will also be sent to property owners who requested it and will be lodged on the project website [www.nzta.govt.nz/hamilton](http://www.nzta.govt.nz/hamilton) under the Noise Mitigation tab.