

Managing traffic noise from new and upgraded roads

We recognise road traffic noise can be a major annoyance, especially in residential areas. We are committed to mitigating and managing road traffic noise impacts when planning and building new roads or substantially upgrading existing roads.

What is noise?

We define noise as 'unwanted sound'. Noise is perceived differently from one person to the next and is measured on a scale of units called decibels. We assess noise by averaging the quietest and loudest (actual or predicted) measurements while also considering how the human ear perceives it.

Operational noise guidelines

Our assessment and management of road traffic noise is guided by three key documents:

- NSW EPA's Road Noise Policy (2011)
- Roads and Maritime Noise Criteria Guideline (December 2014)
- Roads and Maritime Noise Mitigation Guideline (December 2014)

These documents provide noise guidelines which we use when managing road traffic noise in NSW. They are available online at epa.nsw.gov.au/noise and rms.nsw.gov.au (go to the environment page).

During design and planning we seek to achieve the following noise levels at residences:

- 55 decibels during the day and 50 decibels at night for new freeways or main roads
- 60 decibels during the day or 55 decibels at night for upgrades of existing freeways and main roads.
- Other noise sensitive receivers such as schools, hospitals, nursing homes and places of worship are also considered during design and planning.

Noise facts – Rule of thumb

- The further away you are from the source of noise, the less noticeable it is
- Doubling your distance from the road decreases the noise by three decibels
- When traffic volume doubles, the noise only increases by three decibels
- Halving the traffic volume decreases the noise by three decibels
- Most people can't detect a change of one or two decibels in the noise level
- Most people can notice a small change in the noise when levels change by three to five decibels
- Most people will perceive a 10 decibel increase as doubling the noise
- Most people will perceive a 10 decibel decrease as halving the noise.

How do we assess and manage road traffic noise?

Road traffic noise is investigated during the planning phase of each project.

We conduct background noise monitoring and undertake future noise modeling so that we can plan our projects carefully to reduce unwanted sound from vehicles in noise sensitive locations.

In particular we consider landscape features, road location, background noise, traffic projections and their proximity to sensitive receivers. Where noise is likely to be an issue, we also consider the cost and likely benefit to be provided by noise mitigation measures such as barriers, walls and mounds or architectural treatments to sensitive buildings.

We identify and implement road traffic noise mitigation measures at three key project stages:

- during route selection – considering social, economic, engineering, and environmental factors
- during environmental impact assessment and preparation of concept designs – looking at road alignment, gradient of road, geography, current and predicted traffic volumes, and noise walls/mounds, low noise surface and at-house noise treatments
- during detailed design – where any further opportunities are investigated and details of noise walls/mounds, and at-house noise treatments are considered.

The route selection and concept design phases provide the best opportunity to identify and implement measures to reduce noise.

What is taken into consideration when assessing noise?

We consider the location of noise sensitive receivers such as homes, schools, hospitals, nursing homes, places of worship and parks. During planning and when assessing the predicted noise impact we look at:

- Volume and speed of traffic
- Horizontal and vertical road alignment
- Gradient of the road
- Bridge or road surface joints - to ensure they are designed to minimise noise of tyre impact
- Road surface
- Shielding structures such as barriers, walls and mounds
- Natural features such as hills and cuttings to shield noise
- Distance to sensitive receivers
- Construction type and age of sensitive buildings.

We do not provide noise mitigation for:

- Commercial or industrial buildings
- Buildings that are non-conforming land uses (such as residential buildings in an industrial zone)
- Buildings constructed after introduction of the *State Environmental Planning Policy (Infrastructure) 2007* – which required new building next to busy roads to include noise mitigation measures.

How we apply the guidelines

Operational road traffic noise predictions are based on projected traffic volumes in the year the project is due to open and 10 years after opening.

Noise modeling is based on:

- The Calculation of Road Traffic Noise (CoRTN) model. This is a mathematical model that has been specifically validated under Australian conditions and is accepted as the industry standard by the NSW Government
- A three-dimensional road design that reflects the final height of the road, line of sight, including surrounding terrain (such as ridge lines), buildings and noise-sensitive locations
- Traffic speeds and projected volumes
- Proportion of light and heavy vehicles
- Type of road surface
- Height and location of vehicles (tyre, engine and truck exhaust noise)
- Model calibration adjustments from noise monitoring data.

Selecting noise mitigation measures

As a first priority, we seek to reduce road traffic noise at the source through careful road design and a selection of a range of reasonable and feasible mitigation measures such as:

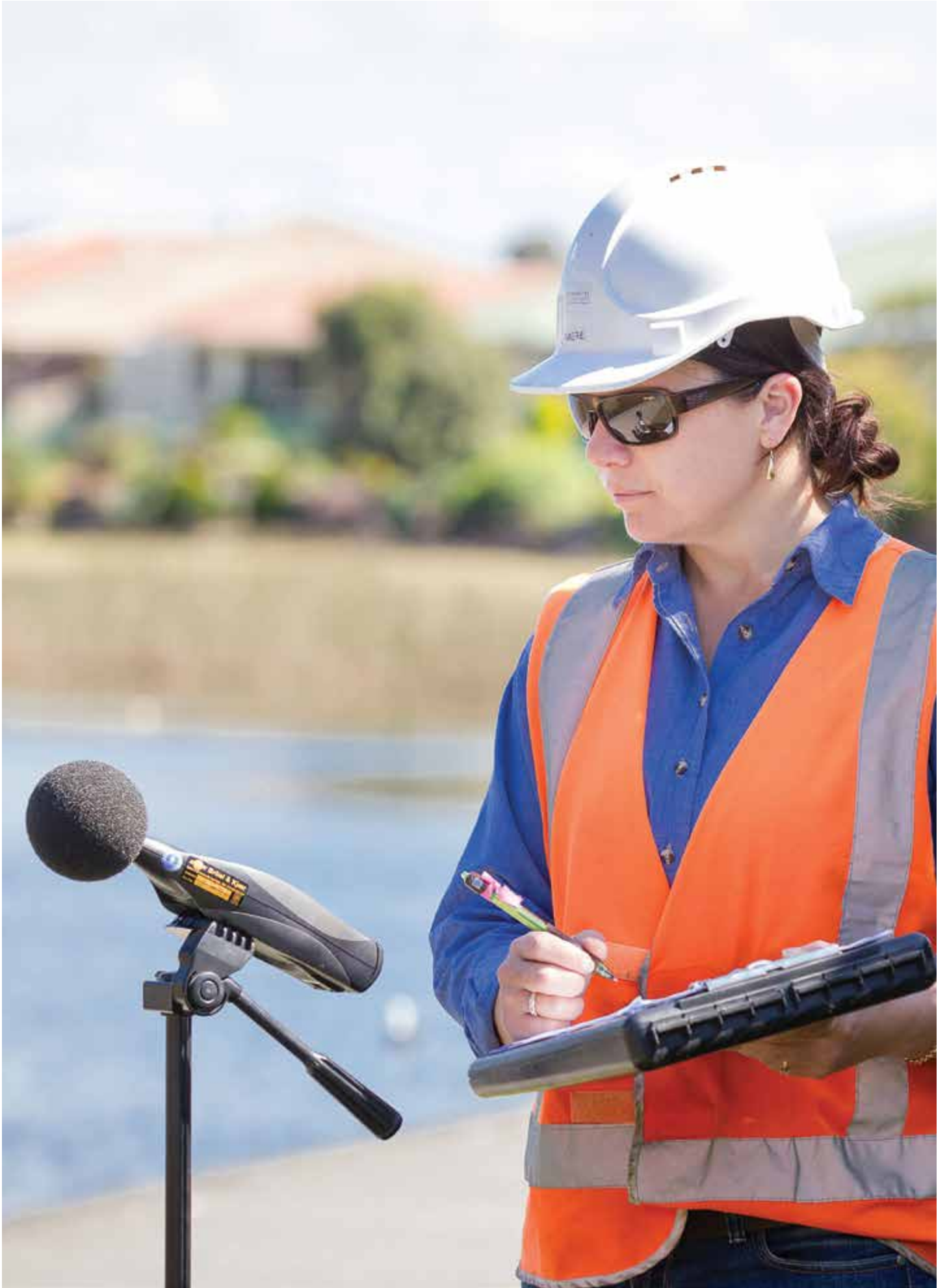
- Noise walls
- Architectural treatments to sensitive buildings such as window glazing and air-conditioning
- Opportunities to use excess material from the project to create soil mounds,
- Driver education programs to reduce use of truck engine breaks (for more information on this please see RMS website)
- Design of road pavements.

What does 'reasonable and feasible' mean?

Noise mitigation is feasible if it is practical and capable of being put in place. For example, a noise mitigation measure is feasible if it can be engineered and is practical to build, considering issues such as safety, access and maintenance.

Selecting reasonable noise mitigation measures involves considering the overall noise reduction benefit delivered by different mitigation measures and the overall economic cost of achieving that benefit. Costs of different mitigation measures vary greatly and not every measure that is possible to build is cost effective in every situation.

For example, in densely populated areas located close to a road, a noise wall or mound may prove to be a reasonable solution as many sensitive receivers will be benefited. However in low density rural or residential areas where sensitive receivers may be located several hundred metres from a new road, a noise wall or mound may not be reasonable or feasible due to the prohibitive cost of building a wall or mound long enough, or high enough, to deliver any significant noise reduction benefit. In this situation, architectural building treatment may be a reasonable solution.



What happens after the new road or upgrade opens to traffic?

After a new road project is finished and opened to traffic, we carry out additional noise and traffic modelling to check if the road complies with our noise guidelines. This is so we can compare actual noise levels against the predicted noise levels used in project design.

If noise levels are found to exceed criteria used for project approval, further consultation is carried out with affected noise-sensitive receivers and additional reasonable and feasible noise mitigation measures may be applied.

What about noise from existing roads?

If you are concerned about noise from an existing road that is not part of a proposed upgrade project please our website for a separate fact sheet on the Roads and Maritime Services' Noise Abatement Program.

What about sleep disturbance?

Roads and Maritime recognises that sleep disturbance from noise can be an issue for the community.

When planning new roads or substantial road upgrades we compare predicted maximum traffic noise levels for the night-time period (10pm-7am) to background noise levels.

Where the difference exceeds 15 decibels, sleep disturbance issues are considered. This usually only occurs at houses located close to the new or upgraded road.

More information

This information is general in nature. For more information about specific projects or noise management strategies, please visit our website at rms.nsw.gov.au