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Environmental Factsheet: Main Roads Traffic Noise Management

Traffic noise can affect people living along major roads. *State Planning Policy 5.4 Road and Rail Noise* was developed by the WA Planning Commission to guide development where noise-sensitive receivers and major transport projects are located in close proximity to each other. This Factsheet outlines the impact of this Policy on Main Roads Western Australia (Main Roads).

State Planning Policy 5.4

State Planning Policy 5.4 Road and Rail Noise (SPP 5.4) promotes mutually compatible land use and transport by road and rail. The objectives of the Policy include protecting the community from unreasonable levels of transport noise and protecting the State's major transport corridors from encroachment by incompatible uses.

SPP 5.4 is supported by the Road and Rail Noise Guidelines (Guidelines), which provides information on how to implement the Policy.

Policy Application to Main Roads

SPP 5.4 applies to the preparation and assessment of planning instruments, including region and local planning schemes; planning strategies, structure plans; subdivision and development proposals. For existing road reserve that does not require the preparation and assessment of a planning instrument, SPP 5.4 provides guidance to Main Roads in its consideration of the noise impacts of its business.

Applicable Roads

Roads to which SPP 5.4 applies have a freight function (i.e. high truck volumes) and /or high total traffic volumes considered likely to generate noise in excess of the Policy's noise targets. The Department of Planning, Lands and Heritage identifies these roads in maps – Schedules 1 (Metro), 2 (South West) and 3 (Statewide) – as well as through a public on-line mapping system, PlanWA, These roads are of two types:

- **Strategic freight and major traffic routes** – roads as defined by Perth and Peel Planning Frameworks and/or roads with either 500 or more Class 7 to 12 Austroads vehicles per day, and/or 50,000 per day traffic volume.
- **Other significant freight/traffic routes** – any State administered road and/or local government road identified as being a future State administered road (red road) and other roads that meets the criteria of either >= 100 Class 7 to 12 Austroads vehicles daily or >= 23,000 daily traffic count (averaged equivalent to 25,000 vehicles passenger car units under region schemes).

Applicable Activities

SPP 5.4 applies to proposed new major roads and major upgrades of existing major roads that are near noise-sensitive land uses. SPP 5.4 states that consideration should be given to a 20-year planning horizon i.e. those new major roads or major upgrades that Main Roads considers likely to be constructed within the next 20 years.

In these cases, Main Roads will either:

- conduct a noise impact assessment and incorporate appropriate controls consistent with the objectives of SPP 5.4 into the design; or,
- demonstrate that the project comprises minor works and will not result in a significant increase in road transport noise.

What is a major road upgrade?

SPP 5.4 defines a major road upgrade as:

- physical construction works designed to facilitate an increase in traffic-carrying capacity (such as carriageway duplication or the addition of a traffic lane);
- a substantial change in the alignment that moves the asset closer to an existing noise-sensitive land-use; or,
- modifications that may improve road capacity, performance or function, such as an intersection expansion or grade separation.

Examples of minor works that do not generally need a noise assessment under SPP 5.4 include:

- Ongoing works such as routine maintenance
- Changing a T-intersection to a roundabout
- Changing from chip-seal to dense-graded asphalt
- Installing a slip lane for turning traffic
- Installing or widening a median strip
- Re-sealing
- Minor changes in alignment

Noise assessments may still be undertaken for minor works if they result in traffic being located closer to a noise-sensitive land use, are likely to be controversial or if assessment is required to meet another commitment.

What is a noise-sensitive land use?

Noise-sensitive land-uses include buildings for residential or accommodation purposes (housing, apartments, taverns, hotels, motels), caravan parks or camping grounds, hospitals, aged care and childcare facilities, schools and universities, and public places of worship.

Other situations SPP 5.4 does not apply

- Retrospectively to existing noise-sensitive land-use in the absence of a major new road or upgrade
- To increases in road and rail traffic noise in the absence of physical construction work
- To fixed sources of noise
- To vibration, which is most commonly associated with rail transport

SPP 5.4 does not require ongoing noise monitoring studies, nor does it require retrofitting of noise walls.

Applicable Noise Targets

SPP 5.4 sets out noise targets that are to be achieved by proposals subject to SPP 5.4. A noise assessment is required to determine if the targets will be exceeded and the likely noise management or mitigation required for the development. These targets are set out in Table 1 below.

Table 1. Noise Targets

Road Proposal	Outdoor Noise Targets dB(A)	
	Day	Night
New	55	50
Upgrade	60	55

Main Roads aims to achieve the SPP 5.4 outdoor targets through the road alignment and/or design, considering the various noise mitigation measures for the road project outlined in the Guidelines.

Main Roads noise assessments of a road are only required for the first row of houses, because it is assumed that if we mitigate noise for this first row, any other houses further from the road will also meet the noise target.

Main Roads is not expected to meet the SPP 5.4 indoor noise targets. If the outdoor noise target is met, it is assumed that a building has a certain amount of acoustic protection to then be able to meet the indoor noise criteria. It is likely unreasonable for a transport infrastructure provider to achieve the outdoor targets at more than 1 or 2 floors of an adjacent development with direct line of sight to the traffic.

The 5 dB difference in the criteria between new and upgrade infrastructure proposals acknowledges the challenges in achieving noise level reduction where existing infrastructure is surrounded by existing noise-sensitive development.

Noise Assessment and Mitigation

Noise Monitoring and Modelling

Existing noise levels from the road are recorded and used to calibrate a noise model to site conditions. Noise modelling is undertaken to predict the likely traffic noise levels of the proposal and to identify relevant noise mitigation measures. The noise model takes into account the following factors:

- On-site noise measurements/monitoring
- Road geometry and topography
- Vehicle types
- Proposed traffic speed
- Future traffic volumes
- Road surfacing
- Height of the new road
- Distance between the road and properties

Noise modelling must be conducted by qualified acoustic consultants. As this is a specialist area, Main Roads has developed documents for seeking the services of a noise consultant including Traffic Noise Measurement Specification (**D12#214997**) and a Noise Assessment Consultant Brief (**D23#595658**).

It is important that Main Roads provides the following information to the Consultant:

- Study Area (as a shapefile)
- Engineering designs (as a georeferenced dwg file)
- Any topographic or survey (contour) data
- 3D model of the proposed alignment (and any options)
- Georeferenced aerial imagery
- Traffic modelling data, which includes the daily average number of vehicles and the proportion of heavy vehicles.
- Vehicle speeds
- Road surfaces

Main Roads aims to achieve the SPP 5.4 targets through road design, considering the various noise mitigation measures for the road project outlined in the Guidelines. Measures are expected to be implemented that balance reasonable and practicable considerations with the need to achieve acceptable noise protection outcomes.

Designing Quiet Roads

Road traffic noise can be reduced through road design. For example:

- Ground-level roads or lowered roads are less intrusive than elevated roads.
- Noise screening walls of sufficient density, height and length can reduce traffic noise levels at nearby homes.
- Road surface types such as dense-graded and open-graded asphalt are quieter than chip-seal.
- Roundabouts are quieter than stop-start controls e.g. traffic lights and stop signs.

Ideally, a road route alignment should be selected that reasonably and practicably maximises separation distances from existing or future noise sensitive land uses. Although not required where an existing planning scheme is in place, this is a consideration recommended by the Department of Planning, Lands and Heritage.

Noise Wall Design

Noise walls reflect sound waves from the road, forcing sound to travel over and around the edges of walls, thereby reducing the amount of noise that reaches nearby homes. The positioning of the walls relative to residential properties is dependent on the road design and the available road reserve.

Several important factors need to be considered when designing noise walls, including:

- The location and site conditions:
    - On level ground, the wall located close to source of sounds is effective,
    - In a cutting, the wall located at the top of a cutting is effective;
- Reviewing the Acoustic Consultant's Noise Assessment Report and recommended height, length and position within the road reserve to achieve noise targets;
- A requirement for continuity with no gaps to provide a mitigating effect on noise, while also allowing the movement of pedestrians, cyclists, emergency vehicles and maintenance vehicles;
- A minimum surface density of 15 kg/m^2;

- Materials and finishes, including colour and texture, in accordance with the overall urban and landscape design for the project;
- Reducing the risk of bird strikes and deaths associated with transparent materials, by instead using frosted, tinted, lined or opaque materials; and
- Minimise maintenance requirements, such as making walls durable, graffiti resistant and providing a clear access.
- Consideration of what is reasonable and practicable; for example, amenity and maintenance considerations that limit the height of noise walls typically constructed by Main Roads to 5 m.

Approvals are required from:

(i) Main Roads Senior Landscape Architect early in the design process with regard to urban design and compatibility of colours and finishes; and,

(ii) Main Roads Asset Manager to ensure the practicality of the wall for ongoing maintenance.

For further information, refer to the corporate procedure on Visual Screens within the Road Reserve (**D14#86444**).

Assessing Compliance with SPP 5.4

As SPP 5.4 also applies to a change in land use adjacent to existing or future major roads, the WA Planning Commission (WAPC) or local governments request Main Roads to review applications for proposed noise-sensitive developments within SPP 5.4's trigger distances.

Advice is provided to the developer on how to adequately consider transport noise in their development applications. This advice often takes the form of reviewing noise assessment reports against the requirements of SPP 5.4 and to ensure noise mitigation is adequate. Refer to the Reviewing Road Traffic Noise Assessments Factsheet and Management Plans (**D16#826275**) for further details about this review process.

The minimum standards that Main Roads expects from a Consultant's noise assessment or acoustic report prepared for a noise-sensitive development are outlined in the Main Roads Requirements for Road Traffic Noise Assessments Factsheet (**D17#339930**).

Construction Noise

SPP 5.4 does not apply to construction noise. Construction noise is regulated under the *Environmental Protection (Noise) Regulations 1997* by the local government in which the works are occurring. Refer to the Main Roads Construction Noise Management Factsheet (**D20#476352**) for further information.

Further Information

For more information on SPP 5.4 or noise management, refer to the Noise Management eLearning Module available in LearningHub or contact Environment Branch.

For more detail on the Noise Regulations, see the Department of Water and Environment Regulation's (DWER's) Noise Regulation Factsheet: Overview of the Noise Regulations.

DWER's Noise Regulation Factsheet: Regulation 13 – Construction Sites provides useful information about managing noise during construction.

Related Documents

- Reviewing Road Traffic Noise Assessments and Management Plans Factsheet (*Guide for Environment Officers and Road Planning Branch*; **D16#826275**)
- Main Roads Requirements for Road Traffic Noise Assessments Factsheet (*Guide for Acoustic Consultants*; **D17#339930**)
- Acoustic Effects of Vegetation Factsheet (**D22#712690**)
- Main Roads Construction Noise Management Factsheet (**D20#476352**)