SDAP Supporting Information

Environmental emissions in a state-controlled road environment

Purpose

This document provides explanatory guidance to support the state's requirements to mitigate impacts from environmental emissions in proximity to a state-controlled road, as stated in *State Code 1: Development in a state-controlled road environment* of the State Development Assessment Provisions (SDAP).

Noise

The content in this section supports the performance outcomes outlined in:

State code 1: Development in a state-controlled road environment:

- Table 1.2.2: Environmental emissions
  - Noise (**PO23-PO27**)

What is the issue?

Road transport infrastructure and vehicles using state-controlled roads generate noise. Noise can have an adverse impact on the health, wellbeing and quality of life of communities located in the vicinity of a state-controlled road if development is not located, designed and constructed to reduce people's exposure to noise from road transport operations and infrastructure.

What is the objective?

The objective of the provisions is to ensure that development affected by noise from state-controlled roads is designed and constructed in a way that reduces the community's exposure to adverse noise impacts.

How to achieve the performance outcome

Performance outcomes 23-27

Applicants proposing new sensitive uses are responsible for ensuring significant noise impacts on the proposed development are mitigated to appropriate levels. Sensitive uses are accommodation activities, educational establishments, child care centres and hospitals.

To demonstrate compliance with the performance outcomes, specific information about the proposed development and surrounding acoustical environment should be provided with a development application in order for the State Assessment and Referral Agency (SARA) to determine whether the development can mitigate noise to acceptable levels for residents, visitors, workers and patrons.

The type of information that needs to be provided with a development application depends on the extent to which the proposed development is likely to be affected by noise generated by road transport operations and infrastructure. The state has sought to minimise the costs of demonstrating compliance with noise criteria by only requiring detailed noise assessment reports to be prepared when there is a medium to high probability of the development being impacted by noise from road transport operations and infrastructure.

Table 1 identifies the likelihood of a development being adversely impacted by noise (based on the type and location of the proposed development) and the corresponding level of information, which must be provided with a development application.

Table 1 Noise information required as part of a development application

Probability of Impact	Development Proposed	Information Required
Low	Development not involving a sensitive use.	Standard information
	Development involving a sensitive use located on land adjacent to a state-controlled road but not in a Transport Noise Corridor declared under the *Building Act 1975*.	
Medium	Development involving a sensitive use that is: • located on land adjacent to a state-controlled road and in a Transport Noise Corridor declared under the *Building Act 1975*, and • the level of impact does not exceed the relevant criteria for the development listed in the Department of Main Roads' (TMR) *Environmental Emissions Policy*.	A report outlining the noise assessment findings and conclusions. (Noise Assessment Report - Part A).
High	Development involving a sensitive use that is: • located on land adjacent to a state-controlled road and in a Transport Noise Corridor declared under the *Building Act 1975*, and • the level of impact will exceed the relevant noise criteria for the development listed in the Environmental Emissions Policy.	A report detailing the noise attenuation measures required as per the results of Part A. (Noise Assessment Report - Part A and Part B).

For **low impact** development the application should include the following supporting information:

- the type of development proposed (i.e. whether the development is a sensitive use)
- the intensity of development proposed (e.g. maximum floor area, maximum building height)
- the location of development on the subject site
- building layouts showing sensitive areas and uses and their distance from a state-controlled road
- contours for the subject site and transport corridor showing any physical embankments/buildings/existing noise barriers located between the state-controlled road and the proposed buildings
- the volume of traffic using the state-controlled road daily.

For **medium impact** development an application should be supported by a Noise Assessment Report – Part A, prepared by an appropriately qualified acoustic consultant and certified by a Registered Professional Engineer of Queensland (RPEQ), and which demonstrates the relevant noise criteria will not be exceeded and therefore no attenuation measures are required. Note, where the Noise Assessment Report – Part A demonstrates the relevant noise criteria will be exceeded, a Noise Assessment Report Part B will need to be prepared. Guidance on preparing a noise assessment report is provided in Appendix 1.

For **high impact** development an application should be supported by a Noise Assessment Report Part A and Part B, prepared by an appropriately qualified acoustic consultant and certified by a RPEQ, and which demonstrates that noise attenuation treatments can be included in the development to ensure that noise levels are reduced to an acceptable level. Guidance on preparing a noise assessment report is provided in Appendix 1.

Application of noise criteria in development assessment

The performance outcomes in SDAP include three types of criteria for noise generated by road transport operations and infrastructure:

a) external (facade corrected) noise criteria for buildings

b) external (free field) noise criteria for outdoor spaces for passive recreation, outdoor education areas and outdoor play areas, and

c) internal noise criteria.

The impact of noise originating from state-controlled roads external to buildings is a prime concern. These areas are the building facades, outdoor areas for passive recreation, outdoor education areas and outdoor play areas. The external criteria are therefore referred to as the 'primary noise criteria', while the internal criteria are referred to as the 'secondary noise criteria'.

Where a new sensitive development is proposed on land in proximity to a state-controlled road and the application is referred to the state for assessment, the state will seek to ensure that the primary noise criteria are achieved in the first instance.

In some circumstances, where the noise criteria for building facades (facade corrected) can be achieved, the criteria for outdoor areas for passive recreation, outdoor education areas and outdoor play areas may be achieved simultaneously. This is because the building facade criteria is always more stringent than the criteria for outdoor spaces for passive recreation, outdoor education areas and outdoor play areas. The logic follows that if the more stringent criteria can be achieved, the less stringent criteria is likely to be achieved also.

The state will only apply noise criteria for outdoor space for passive recreation, outdoor education areas and passive recreation areas where these types of open space are included in a development proposal.

The primary noise criteria in SDAP can be achieved using noise barriers, earth mounds, separation distances/setbacks, topography and site design (building location and orientation) (see section 7.2 of the *Environmental Emissions Policy* for more information on these strategies).

However, near a state-controlled road, when a new sensitive development is proposed and a noise barrier is technically feasible and reasonable, it will always be the Department of Transport and Main Roads (TMR) preferred method for achieving the primary noise criteria. This means that the state will require the proponent of a development near a state-controlled road to provide a noise barrier as a condition of development approval where it is both technically feasible and reasonable.

Where an applicant can demonstrate that the primary noise criteria can be achieved with recommended noise attenuation treatments, compliance with the secondary noise criteria in SDAP will not be assessed by the State.

Where an application cannot demonstrate compliance with the primary noise criteria, the state will take into consideration whether the secondary criteria can be achieved with recommended noise attenuation treatments. In some circumstances the secondary criteria will not be achievable without the use of noise barriers, earth mounds and/or separation distances/setbacks to reduce the impact of noise emissions at the building facade.

An application which demonstrates compliance with the secondary noise criteria must still demonstrate that significant adverse impacts on the development's outdoor space for passive recreation, outdoor education areas and outdoor play areas will be attenuated to the maximum extent practicable and explain why further attenuation measures to achieve the primary criteria were not considered to be reasonable, feasible or cost effective to the satisfaction of the state.

Interaction with the Queensland Development Code for Building in a Transport Noise Corridor

The *Queensland Development Code Mandatory Part 4.4 Building in a Transport Noise Corridor* (QDC MP4.4) addresses internal noise impacts on residential development (i.e. habitable rooms of Class 1, 2, 3, and 4 buildings) within a Transport Noise Corridor.

The Department of Infrastructure, Local Government and Planning's State Planning Policy Interactive Mapping System can be used to determine if a property is located in a designated Transport Noise Corridor.

Where a Class 1, 2, 3 or 4 building is proposed in a Transport Noise Corridor, all building work must be carried out in accordance with the requirements of QDC MP4.4.

Compliance with QDC MP4.4 does not address the state's requirement to comply with the primary criteria listed in Table 3 of the Environmental Emissions Policy. Where a development involving a Class 1, 2, 3 or 4 building is proposed in a Transport Noise Corridor and the application is referred to the state for assessment, the state will seek to ensure that the primary noise criteria listed in Table 3 of the Environmental Emissions Policy are achieved.

In seeking this objective, the state may require the proponent of a development near a state-controlled road to provide a noise barrier as a condition of development approval where it is both technically feasible and reasonable. In addition to reducing noise impacts in private open space, outdoor education areas and passive recreation areas, provision of a noise barrier will likely reduce the noise category that applies to the development under QDC MP4.4. For example, a noise barrier may reduce the noise category from a category 4 to a category 1 which means cheaper building materials can be used to meet the requirements of QDC MP4.4.

The state will not assess compliance with the secondary noise criteria for a Class 1, 2, 3 or 4 building in a Transport Noise Corridor under any circumstances, as the building must comply with QDC MP4.4.

Vibration

The content in this section supports the performance outcome outlined in:

State code 1: Development in a state-controlled road environment:

- Table 1.2.2: Environmental emissions
  - Vibration (**PO28**)

What is the issue?

The operation of state-controlled roads has the potential to generate vibration which can have an adverse impact on the treatment of patients in hospitals. In particular, patient care areas in hospitals must be located, designed and constructed to reduce or mitigate exposure to vibration from state-controlled roads and road transport infrastructure.

What is the objective?

The objective of the provisions is to ensure that patient care areas in hospitals are developed in a way that reduces these area's exposure to adverse vibration impacts from state-controlled roads.

How to achieve the performance outcome

Performance outcome 28

An acceptable outcome has been provided for this performance outcome. An application can demonstrate compliance with the acceptable outcome by providing a RPEQ certified vibration assessment report which demonstrates that the vibration dose values in patient care areas of hospitals does not exceed the levels specified in the acceptable outcomes.

If an application does not comply with the acceptable outcome, details of the alternative means of minimising vibration impacts from state-controlled roads in patient care areas should be provided.

Air and light

The content in this section supports the performance outcomes outlined in:

State code 1: Development in a state-controlled road environment

- Table 1.2.2: Environmental emissions
  - Air and light (**PO29-PO31**)

What is the issue?

Air and light emissions from state-controlled roads have the potential to have an adverse impact on the health, wellbeing and quality of life of nearby communities. In particular, development should be located, designed and constructed to reduce or mitigate the community's exposure to air and light emissions emanating from state-controlled roads and road transport infrastructure.

What is the objective?

The objective of the provisions is to ensure that sensitive developments affected by air and light from state-controlled roads are developed in a way that reduces the community's exposure to adverse air quality and light impacts.

How to achieve the performance outcomes

Performance outcomes 29-30

Acceptable outcomes have been provided for these performance outcomes. An application can demonstrate it has complied with the acceptable outcomes by providing the following information as part of the application:

- for accommodation activities:
  - a site plan which clearly identifies the outdoor space for passive recreation for each dwelling and any shielding buildings and structures. It should be noted that not all outdoor spaces for passive recreation need to be shielded from a state-controlled road. If the application demonstrates that each dwelling has access to an outdoor space for passive recreation which is shielded from the state-controlled road which can include access to private, communal or public open space then the application will comply with the acceptable outcome.
- for education establishments and child care centres:
  - a site plan which clearly identifies the location of all outdoor education area and/or outdoor play areas and any shielding buildings and structures.
- for accommodation activities, education establishments and child care centres:
  - a structural design or information which demonstrates that a fence or other structure provided to shield the outdoor space is solid and gap-free.

Performance outcome 31

Acceptable outcomes have been provided for this performance outcome. An application can demonstrate it has complied with the acceptable outcomes by providing the following information as part of the application:

- building layout plans and designs demonstrating that the number of windows or transparent/translucent panels facing a state-controlled road have been minimised, and/or
- that windows for habitable rooms do not face a state-controlled road, and/or

- windows facing a state-controlled road include treatments, such as blinds or curtains that enable light from a state-controlled road to be blocked during the night time hours.

Contact details

Please contact your local Transport and Main Roads office for more information. The contact details for your local Transport and Main Roads office are listed at www.tmr.qld.gov.au/About-us/Contact-us/In-person/Roads-offices.

Appendix 1: Noise Assessment

Where development includes a sensitive land use and is likely to be impacted by noise from a state-controlled road, an applicant should provide a noise assessment report demonstrating that:

- relevant noise criteria will not be exceeded and therefore no attenuation measures are required, or
- noise attenuation treatments can be included in a development to ensure that noise levels are reduced to an acceptable level.

A noise assessment report seeks to ensure that any sensitive development achieves acceptable noise levels for residents and visitors by ensuring development mitigates the adverse impacts from noise generated by a state-controlled road.

A noise assessment report should adequately document and present all the data inputs, assumptions and assessment results, and noise attenuation strategies/options considered as part of the assessment. In order to limit the expense of preparing reports, a noise assessment report has been split into two parts:

- **Noise Assessment Report – Part A** is to present the noise assessment findings. The findings and conclusion of Part A will determine whether noise attenuation measures will be required for the development
- **Noise Assessment Report – Part B** is to detail the noise attenuation measures required as per the results of Part A and will only need to be provided when measured noise levels exceed the relevant noise criteria for the development in *State code 1: Development in a State-controlled road environment*.

Where it is obvious that a development will require noise attenuation measures, it is suggested a full noise assessment report (i.e. Part A and Part B) be prepared at the same time. Matters that the noise assessment report should consider are outlined as follows:

Noise Assessment Report Part A – Review of noise impacts

Development details

The following information is to be provided:

- description of the subject site including real property description/s and a locality plan
- architectural drawings illustrating the proposed development including building and open space layout plans, noise sensitive areas and uses, the setback distances for building facades (noise sensitive locations), proposed lot numbers (if applicable)
- drawings showing site contours and earthworks (cut and fill) information to clarify the existing topography and proposed finished levels
- confirmation of the extent and height of any existing noise barriers and their location in relation to the proposed development.

Noise measurement

The following information is to be provided:

- a summary of the noise measurement results including a layout plan depicting the site locations and positions of the noise measurements conducted for the assessment, the time of day and weekday the measurements took place
- measurement data sheets and site attendance records/site notes taken by the consultant measuring noise at each measurement site:
    - all results of measurements, calculations and predictions are to be presented in a tabular format

- tabulation of calculated noise levels for all noise sensitive receptors (without noise attenuation treatments)
- noise contours or plans showing specific areas where noise criteria are exceeded:
    - the noise level exposures can be produced as noise level contours or presented in a format depicting areas where the specified noise criteria are exceeded or where the noise levels of noise sensitive receptors fall within a certain noise level range. Which format to adopt will depend on the number of factors/options/criteria considered in the noise assessment and the type of development proposal being assessed
    - when presenting noise contours, the figure should make clear whether the noise levels are facade corrected or free field based on a grid assessment. This assessment will determine the relative accuracy of the contours compared with the facade calculations and the receptor height assumed. The maximum grid spacing shall be a 10 metre by 10 metre square depending on the accuracy required. Reference to grid spacing assessment is to be noted in the title block for each figure.

Acoustic assessment

For acoustic assessment, the following information should be provided:

- description of the investigation process in determining the noise exceedance:
    - careful interrogation of noise level contours needs to be undertaken in conjunction with the tabulated noise levels in order to clearly identify whether any of the criteria levels are exceeded
- documentation of all noise model input data and assessment criteria adopted. The source and date of collection of all data used should be clearly documented. Data more than 12 months old cannot be used in the acoustical assessment
- all acoustical assessments undertaken as part of the noise assessment report must take the following into account:
    - for reconfiguration proposals the assumed location of residential building facades is to be the minimum setback distance required by the relevant local government planning scheme for detached and duplex housing. For other noise sensitive developments, the assumed facade location is to be as per the relevant planning scheme. In these situations, a ‘facade correction’ of 2.5dB(A) should be added to the free field measurement of 1 metre from the assumed facade to determine the facade corrected noise level
    - the receptor height used in the acoustical assessment should be 1.5 metres above the finished floor level/s. In the case of multi-level buildings, all floor levels are to be assessed. For residential reconfigurations, where the finished floor level is not known, the receptor heights should be assumed at 1.8 metres and 4.6 metres above an assumed building pad level, for the ground and first floors (first and second storey) respectively. It is essential that both low and high-set residential buildings be considered in the assessment.

Recommendation

The noise assessment report Part A must clearly articulate whether noise generated from the transport corridor exceeds the relevant noise criteria as outlined in SDAP. If levels are exceeded, the report must recommend that attenuation measures are to be provided by the development.

Certification

The noise assessment report Part A is to be prepared by a qualified acoustic consultant and certified by a RPEQ.

Attachments

Attachments to include where applicable are:

- all field measurement results
- all input and output data and analysis including modelling data files in electronic format
- supplementary reports and references
- any other explanatory and general notes.

Noise Assessment Report Part B – Noise attenuation measures

If the noise assessment report Part A recommends that noise attenuation measures are necessary, these measures should be presented as per the requirements of Part B.

Attenuation

Part B should provide full details of the preferred noise attenuation strategies and clearly demonstrate that the proposed measures will reduce noise to acceptable levels including:

- description of the investigation process in determining the preferred noise attenuation strategies/options
- description and layout plans of all existing and recommended noise attenuation treatment/options, including the length, height and location of proposed noise barriers
- layout plans showing the length, height and location of all existing and recommended noise attenuation treatment options. These should include:
    - the maximum height above proposed finished ground levels in Reduced Levels (RLs) on Australian Height Datum (AHD) of any proposed noise attenuation structures, which are required to meet the TMR's noise criteria
    - the maximum height above proposed finished ground levels in RLs on AHD of any proposed noise attenuation structures, which are required to meet the TMR's noise criteria for the ground level (first storey) of any noise sensitive receiver (if different from above)
    - the maximum height above proposed finished ground levels in RLs on AHD of any proposed noise attenuation structures which are required to meet the TMR's noise criteria for the first floor level (second storey) of any noise sensitive receiver
    - if the proposed noise attenuating structure(s) include/s an earth mound/s, the footprint extent of any earth mound/s
    - the layout of the proposed development.
- supporting analysis, calculations and model outputs substantiating the ability of the proposed treatments to attenuate noise to acceptable levels.

Recommendations and conclusions

The noise assessment report Part B must clearly demonstrate and subsequently recommend that the development provide noise attenuation measures to ensure noise generated from the transport corridor meets acceptable noise criteria as outlined in SDAP.

Certification

The noise assessment report Part B is to be prepared by a qualified acoustic consultant and certified by a RPEQ.

Attachments

Attachments to include where applicable:

- all input and output data and analysis including modelling data files in electronic format
- supplementary reports and references
- any other explanatory and general notes.