

# Noise and vibration

Environmental noise and vibration are disruptive effects typically generated by human activity. Expected environmental noise and vibration sources from the T2D Project include road traffic, surface construction works and tunnelling. Different types of noise and vibration sources are regulated differently. Baseline assessments and modelling help inform the level of risk and potential impact from a project or activity, and are used to determine reasonable and practical mitigation measures.

Noise and vibration impacts are assessed at sensitive receptors, which are typically residential dwellings, schools, hospitals and places of worship. Vibration sensitive receptors typically include occupied buildings, heritage listed places and sensitive infrastructure and equipment.

## Existing environment

The existing South Road corridor travels through an urbanised area of mainly commercial and residential properties. Areas not immediately adjacent to South Road are primarily residential, whilst Hindmarsh, Mile End and Edwardstown are predominantly commercial and

industrial suburbs. There are also parks and reserves in the vicinity of the project.

Several heritage listed places and items sensitive to vibration are located along the existing South Road corridor, including Hindmarsh Cemetery, Brickworks Hoffman kiln, Thebarton Theatre and St Mary's Anglican Church. Other non-heritage vibration sensitive items include the SA Power Networks (SAPN) substation at St Marys, the Telstra Exchange in Edwardstown and the Tennyson Medical Centre in Kurralta Park.

Baseline vibration monitoring has been undertaken at 25 potential vibration sensitive locations, including 15 heritage listed places. The monitoring helps the project team understand the existing vibration exposure levels at these locations and informs appropriate vibration limits for project activities. The existing vibration levels in the environment are generally low and mainly influenced by road traffic. Other sources of vibration are localised sources such as industrial activity which typically have minimal impact at sensitive receptors located far away.

The existing noise environment in the vicinity of South Road is generally influenced by road traffic noise. In some areas, commercial or industrial activity also contributes to the noise environment. In residential areas set back further from South Road, the noise environment is influenced by local traffic, domestic activity and background sounds from the natural environment (birds/wind).

Baseline noise monitoring has been undertaken at 25 locations in the vicinity of the project to help quantify the existing day and night traffic noise levels from South Road. The noise monitoring data has been used to validate road traffic noise modelling and supports the establishment of appropriate construction noise targets.

## Potential impacts to existing environment

Potential noise and vibration impacts from the project have been assessed by applying the T2D Project's assessment methodology for both the construction and operational phases of the project. The key noise and vibration impacts that must be minimised include:

- noise and vibration from construction and tunnelling activities
- potential damage to buildings/structures from construction vibration
- road traffic noise from the T2D Project alignment, particularly after demolition of existing buildings and structures to accommodate the project design
- noise emissions from supporting infrastructure.

## Alternatives, mitigation and opportunities

Minimising road traffic noise impacts continues to be a central focus through the planning and development phases of the project. The use of tunnels for the majority of the road alignment is expected to provide significant reductions in traffic noise on the surface roads above. Additionally, tunnel boring machines minimise noise and vibration impacts during construction in comparison to typical cut and cover tunnelling or other open motorway construction.

Construction noise and vibration impacts, will be managed through a Construction Noise and Vibration Management Plan (CNVMP). This CNVMP will assess all construction activities and outline the management and mitigation strategies necessary to address impacts. Key management and mitigation strategies include:

- using low noise/vibration construction methods and equipment where possible
- scheduling noisy work during daytime hours to minimise night works and reduce sleep disturbance where practicable and safe to do so
- monitoring noise and vibration levels during construction and amending work activities and times where possible
- undertaking property condition assessments and monitoring vibration levels during construction
- community consultation and stakeholder engagement to inform and engage the public
- constructing acoustic fences or enclosures to reduce the impact of construction noise.

Noise mitigation will be incorporated where modelled road traffic noise from the project design exceeds established criteria. This could include a combination of roadside noise barriers, property fencing upgrades and architectural property treatments. The location and configuration of noise barriers and property fencing will be developed with consideration of other factors such as access, visual amenity and community preference.

Noise impact of supporting infrastructure such as tunnel ventilation facilities will be assessed and where required, incorporate noise mitigation such as attenuators, acoustic louvres and low noise units.

## Approvals, permits and authorisations

The project will need to demonstrate that all reasonable and practical measures will be undertaken to minimise noise and vibration impacts during construction and operation.

The project must demonstrate compliance with the Department's Environment and Heritage Technical Manual (EHTM) Attachment 7D – Guideline for the Management of Noise and Vibration: Construction and Maintenance Activities which provides guidance as to the assessment and mitigation approach for noise and vibration impacts during construction. Approval must be sought for CNVMPs and any Night Work Management Plans.

The project must demonstrate compliance with the EHTM Attachment 7A – Road Traffic Noise Guidelines which provide guidance in assessing road traffic noise and vibration. The Road Traffic Noise Guidelines set out the general process to be followed and criteria to be applied when assessing the operational road traffic noise and vibration impacts of infrastructure projects involving new roads and/or major redevelopment of existing roads/road corridors. Compliance with EHTM Attachment 7C – Noise Treatment Implementation Guideline will also be required, regarding the implementation of noise mitigation treatment.



Artist's impression

Scan the QR code to view the suite of assessments included in the PAR or visit [T2D.sa.gov.au/PAR](https://T2D.sa.gov.au/PAR).

