



Suburban Rail Loop East

Environment Effects Statement

Noise, vibration and electromagnetic interference



Suburban Rail Loop is a city and state-shaping project that will transform Victoria's public transport system, enhance Melbourne's middle suburbs and create a long pipeline of jobs.

Suburban Rail Loop East from Cheltenham to Box Hill (SRL East) will connect Melbourne's growing health, education, retail and employment precincts in Melbourne's east and south east.

The 26-kilometre SRL East tunnel will be built as a standalone line that is integrated with the existing public transport network.

A high-tech fleet of energy efficient trains will run on the line, stopping at the six new underground stations at Cheltenham, Clayton, Monash, Glen Waverley, Burwood and Box Hill.

Planning processes

After two years of detailed planning and development work, SRL East's Environment Effects Statement (EES) has been released.

The SRL East EES identifies benefits and potential impacts during construction and operation and proposes ways to avoid, minimise, offset or manage any effects.

The EES for SRL East includes 19 different studies and technical reports on topics such as noise, vibration, traffic, ecology and social impacts.

Also released is a draft Planning Scheme Amendment (PSA) showing proposed changes to local planning schemes so land can be used to build rail infrastructure for SRL East.

The SRL East EES and draft PSA can be viewed in full on the Suburban Rail Loop website at suburbanrailloop.vic.gov.au/EES

More information about community engagement can be found in Attachment E of the SRL East EES - Community Engagement Report.

This factsheet

We've developed a suite of fact sheets to help you navigate the SRL East EES and connect you with the information that is relevant to you.

This fact sheet provides information about how potential impacts of noise, vibration and EMI have been considered and explains where you can find more detail in the SRL East EES.

EES study topics covered in this fact sheet:



Airborne noise



Vibration and ground-borne noise



Electromagnetic interference (EMI)

What we've heard so far about noise, vibration and electromagnetic interference

Since mid-2019, we've engaged with over 20,000 people via online and face to face consultation.

Key feedback relating to **noise, vibration and electromagnetic interference (EMI)** included:

- Questions about vibration during construction and when trains are operating in the new tunnels, in particular any impacts on sensitive receivers including around medical, education and research precincts
- Questions about potential damage to properties caused by tunnelling under residential areas
- Questions about noise during construction, in particular night works
- Questions about operational noise from supporting infrastructure including the train stabling facility at Heatherton, the emergency support facility at Mount Waverley and the power supply substation at Burwood
- Need for mitigation measures to manage noise and vibration for people living and working near the SRL East alignment
- Need to minimise EMI effects on sensitive equipment and ensure appropriate mitigations are implemented in consultation with stakeholders.

Managing noise, vibration and EMI impacts

Suburban Rail Loop Authority is committed to minimising the impact of noise, vibration and EMI during both the construction and operation of SRL East.

By using alternating current, smaller and lighter SRL trains that require less power, and installing vibration reducing trackform, the project is designed to minimise the operational impacts of noise, vibration and EMI.

Additional mitigation measures have been identified and form the basis of Environmental Performance Requirements (EPRs) recommended by specialists through the EES process.

The recommended EPRs for noise, vibration and EMI include:

- Managing construction noise and vibration in accordance with the Environment Protection Authority's (EPA) guidelines and other relevant noise and vibration standards
- Ensuring the appointed contractor/s develop and implement a **Construction Noise and Vibration Management Plan**, including measures to reduce, manage and monitor impacts
- Implementing reasonably practicable measures to minimise noise and vibration including the selection of construction equipment, hoarding and screening site boundaries, site layout design and acoustic sheds
- Implementing guidelines that offer dedicated support and include a range of measures for residents and businesses who may experience temporary impacts from noise and vibration

Terminology

Airborne noise is transmitted through the air and can emanate from sources such as construction plant and equipment, traffic and ventilation systems. When it exceeds background noise levels it can result in disturbance to amenity particularly for sensitive receivers such as residents, schools, hospitals and day care facilities. Noise is measured by a sound meter using the decibel scale.

Vibration is the movement of an object back and forth and may be expressed in terms of displacement, velocity or acceleration. Construction vibration is often measured as vibration velocity (Peak Particle Velocity in mm/s) using an accelerometer or geophone. Vibration Dose Value is a metric used to accumulate vibration energy over a day or night time period to determine its impact on human comfort.



SRL East site investigations at Glen Waverley

- Working with identified stakeholders to identify and implement appropriate mitigation measures to protect sensitive equipment in health, education and research precincts
- Implementing an engagement plan to liaise with community and stakeholders about potential noise and vibration impacts prior to works occurring.

More information about environmental performance requirements can be found in Attachment A of the SRL EES - Environmental Management Framework.

Ground-borne noise is noise heard within a building that is generated by vibration transmitted through the ground into a structure. It is typically heard as a low frequency "rumbling" and is often referred to as "regenerated noise". Ground-borne noise is measured by a sound meter.

Electromagnetic interference (EMI) occurs when there are changes in electromagnetic fields resulting from the introduction of a new source or where large, moving and metallic objects cause fluctuations in electromagnetic fields that may affect the performance of devices, transmission channels or systems that are sensitive to these changes.

Airborne noise



SRL East site investigations at Box Hill

During construction, airborne noise would be generated from above-ground construction works as well as the excavation of station boxes and tunnel access points. This includes works for the SRL stations, the train stabling facility, emergency support facility and power supply substation.

Assessments found that construction noise levels are generally expected to comply with construction noise benchmarks. Where short periods of noisy works are unavoidable, such as during site establishment, early consultation with potentially affected residents, businesses and facilities would be used to determine ways to avoid or manage impacts. Once works progress below the surface, residual airborne noise levels would be significantly lower.

The majority of above-ground works and spoil removal would occur during normal working hours – Monday to Friday from 7am to 6pm, and on Saturday from 7am to 1pm.

Assessing noise and vibration impacts

SRL East would result in some areas of Melbourne's east and south east being exposed to temporary noise and vibration above existing levels. Specialist investigations assessed existing levels of noise and vibration, and considered potential impacts on people, buildings, and sensitive equipment across the project area. Assessments for the EES demonstrated the project could be operated in compliance with applicable noise and vibration regulatory standards and guidelines.


Shorter term noise is anticipated from surface level works to stabilise soil to excavate tunnel cross passages. Cross passages will be constructed at various intervals along the alignment. The duration of works is expected to be three to six months per location; however, impacts from surface level noise will be for shorter periods of time.

Other measures to minimise the impacts of construction noise involve using squawkers for reversing vehicles, acoustic sheds, noise barriers and installing noise monitoring equipment to identify whether further mitigation measures need to be implemented.

Once SRL East is operational, train movements would mostly be underground in the twin tunnels, minimising above-ground airborne noise transmission.

Operational noise from supporting infrastructure, including the train stabling facility, emergency support facility and power supply substation, was also assessed. Noise predictions indicate these facilities can be designed to comply with noise limits set out in the EPA Noise Protocol.

Predicted noise levels from the surface rail line adjacent to the stabling facility would comply with the Victorian Government Passenger Rail Infrastructure Noise Policy (PRINP).

 **MORE INFORMATION ABOUT NOISE AND VIBRATION PERFORMANCE REQUIREMENTS CAN BE FOUND IN ATTACHMENT A OF THE SRL EAST EES – ENVIRONMENTAL MANAGEMENT FRAMEWORK.**



SRL East site investigations at Box Hill

Vibration and ground-borne noise

The majority of residents and businesses along the SRL East alignment will not be affected by vibration and ground-borne noise.

Predictive modelling identified that vibration generated during construction and operation of the project is not expected to impact any structures (including heritage buildings), underground utilities, or sensitive equipment.

A small number of residents and businesses may experience some temporary impacts, caused by vibration-inducing equipment, such as hydraulic hammers and vibratory rollers. These impacts may last between a few days to several weeks over intermittent periods.

To mitigate impacts, construction works at surface locations and cross passages would typically only occur during the day to prevent interfering with peoples' evening and night time amenity.

Most residents will not experience any vibration or ground-borne noise impacts from the tunnel boring machines which would operate 24 hours a day, seven days a week.

Once SRL East is operational, ground-borne noise and vibration impacts can be avoided through implementation of design considerations. Inside the tunnels, treatments applied to the rail tracks would avoid any impacts at surface level caused by train movements.




Monash Children's Hospital, Clayton



Monash Children's Hospital, Clayton

Measuring noise and vibration

To understand the potential impacts of SRL East, noise and/or vibration measurements were taken at more than 100 locations along the project's proposed alignment. These measurements captured existing conditions. A range of construction activities with the potential to generate noise and vibration were assessed in the EES including tunnelling, demolition works, excavation works, rock breaking, bored piling and the construction of station boxes and other structures.

 **MORE INFORMATION ABOUT MANAGING IMPACTS ON RESIDENTS AND BUSINESSES CAN BE FOUND IN ATTACHMENT D OF THE SRL EAST EES – BUSINESS AND RESIDENTIAL SUPPORT GUIDELINES.**



Electromagnetic interference (EMI)

Electromagnetic fields from SRL East would not affect the health or amenity of residents, local communities or commuters. The power required by the smaller and lighter trains on SRL East would be less than most urban railways.

For the majority of stakeholders, the predicted EMI during construction and performance is below levels that would impact on the performance of specialised medical, research, manufacturing or recording equipment that may be sensitive to EMI. The distance and depth of the tunnels from sensitive receivers also avoids adverse impacts on specialised electronic equipment.

Suburban Rail Loop Authority has worked with stakeholders to identify this sensitive equipment along the rail alignment. The Authority will continue to liaise closely with the owners of sensitive equipment to manage or mitigate any potential impacts during construction and operation.



SRL East site investigations at Monash University

Assessing EMI

A range of steps were taken to assess the potential for electromagnetic interference resulting from the construction and operation of SRL East. This involved identification of potentially sensitive equipment along the alignment, establishing baseline levels by undertaking electromagnetic field measurements at key locations, calculating maximum electromagnetic field levels for power systems (including SRL East's electrical equipment, overhead wires in tunnels and substations) and undertaking a human health compliance assessment.

Make a submission

Submissions on the SRL East EES and draft Planning Scheme Amendment (PSA) are invited during the public exhibition period.

Submissions must be made in writing to **Planning Panels Victoria** and received by **11:59pm on Thursday 16 December 2021**.

For questions relating to submissions contact the Department of Environment Land Water and Planning **Customer Service Centre on 136 186**.

To make a submission visit engage.vic.gov.au/srl-east-iac

More information

To find out more about Suburban Rail Loop:

- 🏠 suburbanrailloop.vic.gov.au
- ✉ contact@srla.vic.gov.au
- 📞 1800 105 105 (24 hours a day, 7 days a week)

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It should be noted that this information is current at the time of printing, however changes may occur. Please visit suburbanrailloop.vic.gov.au for the latest updates.