

Tunnelling information pack for Iron Cove

This pack is to provide you with general information about upcoming tunnelling activities in Iron Cove. Tunnel excavation is currently scheduled to start in mid October 2020 and will take approximately one year to complete. We'll keep you updated as tunnelling progresses, however please refer to this Pack for general information about the work, including the excavation methodology, ground monitoring activities, noise and vibration impacts and more.

Tunnel locations and depths

To view an interactive map of the Rozelle Interchange tunnels, please visit the online [Tunnel Tool here](#). The Tunnel Tool will show you the depth and location of the tunnels in relation to your property.

How we're tunnelling

The majority of the Rozelle Interchange tunnels are excavated using a roadheader, which is a special excavation machine that cuts the rock in a circular motion. Roadheader excavation creates a rumbling/thunder sound.

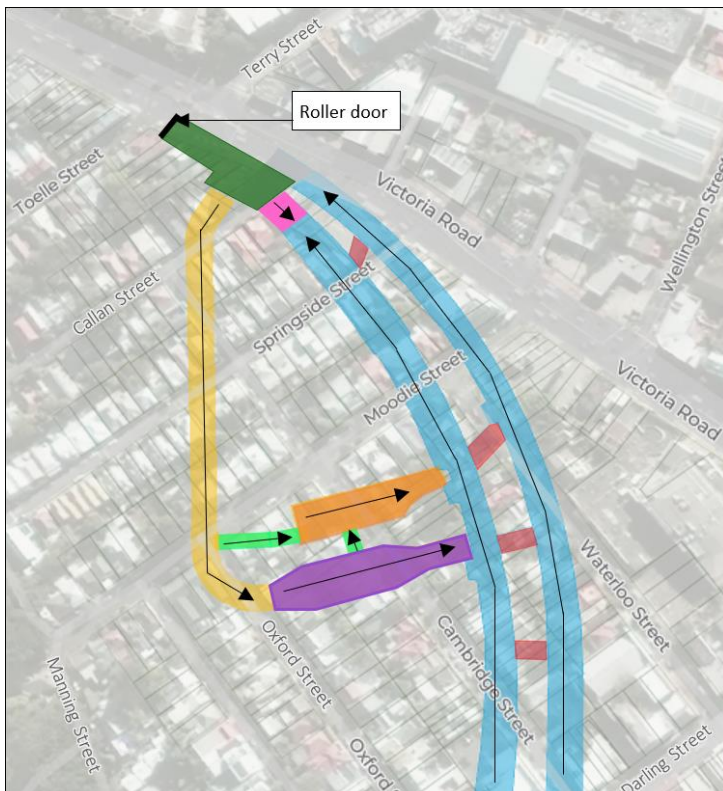
For every one to five metres of excavated rock, we install ground support in the form of rockbolts and shotcrete.

Rockbolts are metal rods being drilled into the tunnel roof. Shotcrete is sprayed concrete.

The size of the tunnel being dug will influence the excavation timeframe and the amount of times that the roadheader will need to pass through the tunnel. Please locate your house on the map below to identify the tunnel(s) near you and refer to the same colour in the legend for expected excavation timeframe.

The excavation methodology for each of the tunnels is outlined in further detail over the page.

When and where we're tunnelling



Legend

- Future tunnel exit portal
Mid October to early December 2020
- Traffic tunnel
Mid November to mid December 2020
- Ventilation tunnel
November 2020 to March 2021
- Ventilation cavern
March to May 2021 and again in August/September 2021
- Access tunnels
June 2021
- Substation
June to August 2021
- Traffic tunnels
Intermittently from early to late 2021
- Cross passages (connecting tunnels)
Approximately one week per tunnel in mid to late 2021
- ▶ Tunnelling direction

The timeframe for tunnelling can change due to many reasons. Any changes to the excavation timeframe will be communicated in the weekly email update.

Future tunnel exit portal

From mid October to early December 2020 we'll use a roadheader and an excavator with a hammer attachment to excavate a large trench within our construction site near Callan Street. This activity will only be undertaken during standard day-time construction however is unfortunately expected to generate high noise. Rock hammering will be undertaken in blocks of three hours, with a respite hour at 11am and 3pm.

Once excavated we'll place a roof over the trench and install a large roller door at the end as shown on the map on page 1.

The roller door will serve as the entrance to the tunnels below ground, enclosing noise from tunnelling activities similar to an acoustic shed and allowing us to undertake both day and night time tunnelling.

In the final design vehicles will exit the traffic tunnel at this location.

Initial section of traffic tunnel and **Ventilation tunnel**

We expect to commence day and night time tunnelling in November 2020, starting with the first 20 metres of the traffic tunnel (shown in bright yellow on the map) and the ventilation tunnel. The ventilation tunnel will be constructed from beneath Callan Street progressively towards Springside and Moodie streets and then between Oxford and Cambridge streets.

The ventilation tunnel will connect the traffic tunnels (shown in blue) with the ventilation outlet on Victoria Road, preventing vehicle emissions from exiting at the tunnel exit portal once the tunnels are operational. This ventilation tunnel is approximately ten metres wide and ten metres high.

We'll excavate this tunnel using a roadheader, starting from within our work site adjacent to Callan Street. The roadheader will pass through this tunnel once, excavating the tunnel roof and floor simultaneously.

Ventilation cavern

The ventilation cavern will eventually house fans and electrical equipment. It will be about 25 metres wide and 15 metres high.

Excavation of the ventilation cavern will be undertaken in three stages. First, the roadheader will excavate the roof inside the cavern. This is expected to take approximately six weeks.

Once excavation of the tunnel roof has been completed inside the cavern, the roadheader will remove a middle layer and eventually the bottom section. This floor removal process is called benching and is expected to take eight weeks in total. Noise and vibration impacts from benching is similar to tunnel roof excavation.

We're currently planning to excavate the roof inside the ventilation cavern for six weeks from March 2021, with benching planned for four weeks in May and four weeks in August/September 2021.

Substation

The substation will house electrical equipment required to operate the tunnels and will be about 20 metres wide and 10 metres high.

We'll excavate the substation using the same methodology as the ventilation cavern, firstly removing the roof and then the floor. Excavation of the substation will take approximately eight weeks in total from late June 2021.

Access tunnels

These tunnels will be used for access between the ventilation tunnel, ventilation cavern and substation. The access tunnels will be approximately five metres wide and ten metres high, and are currently expected to be excavated in June 2021.

As these are smaller than the cavern and the substation, the roadheader will only need to pass through once to excavate the tunnels.

Traffic tunnels

The traffic tunnels will be excavated in two stages. The first stage involves excavating the tunnel roof using a roadheader which typically progresses at approximately 25 metres per week for the traffic tunnels.

The second stage involves removal of the tunnel floor using a roadheader. This process can occur any time after excavation of the tunnel roof and is usually much quicker, progressing at about 20 metres per day.

Cross passages

These are connecting tunnels that allow people, including emergency services, to move from one tunnel to the other in the event of an emergency.

Each cross passage will take approximately one week to excavate. The roadheader will only need to pass through once to excavate these tunnels.

Any changes to the tunnelling timeframes or methodologies outlined above will be communicated in the weekly email update.

Hours of operation

The project has approval to carry out tunnelling activities **24 hours per day, seven days a week**. Tunnelling in Iron Cove will mainly be undertaken from 6am Monday to 6am Saturday (24 hours per day).

Tunnelling activities may occasionally take place inside the tunnels from 6am Saturday to 6am Monday, as required.

We expect to start day and night time tunnelling in November 2020.

Some concrete deliveries will be required at night to allow ground support to be installed immediately after excavation. These trucks will enter and exit the site via Victoria Road.

Tunnelling activities at Iron Cove will cease over the Christmas break. We'll confirm the exact dates closer to the time.

What we do with the excavated material

The excavated rock (spoil) is taken from the tunnel face up to the surface via specialised dump trucks called moxies. Spoil is then removed from the site during day time hours using trucks with trailers via the entrances on Victoria Road. Spoil trucks for tunnelling will not travel on local roads in Iron Cove.

Ground monitoring

Settlement is the movement of ground caused from changes in stresses in the rock. The excavation of tunnels will almost always cause some settlement. Ground movement is expected, assessed and considered in the tunnel design. The ground is monitored throughout tunnelling to ensure movement remains within the limits outlined in the project's Infrastructure Approvals, endorsed by the Department of Planning, Industry and Environment.

Over 960 boreholes have been drilled so far to confirm the ground conditions along the alignment. The Rozelle Interchange is located almost entirely in Hawkesbury Sandstone, a strong and consistent rock, ideal for tunnelling.

The Project has a team dedicated to monitoring and measuring ground movements both inside the tunnel and on the surface as excavation progresses.

On the surface there will be two types of monitoring instruments installed both close to and away from the tunnel alignment:

- **Prism markers:** around 1000 small markers temporarily fixed onto kerbs and roads along the tunnel alignment for the duration of the project
- **Extensometers/ inclinometers:** survey instruments drilled into roads at various locations along the tunnel alignment as well as in neighbouring suburbs

You'll probably notice our surveyors on your street as excavation approaches and survey checks become more frequent, up to two times a day.

Inside the tunnel our geotechnical team checks every new tunnel advance (every one to five metres) in a process called 'facemapping' whereby the ground conditions are continually assessed and compared to the data collected from the investigation boreholes. This team then sits with the design and construction teams in a daily progress meeting to confirm the tunnel design including the proposed roof support is suitable for that section.

Property

Previous experience has shown that property damage from tunnelling is unlikely. Residents within 50 metres of the tunnel alignment will have received an offer for a free **property condition survey** which we hope you've accepted.

The survey will ensure there is a clear record of the property's condition prior to any major construction activities taking place. Within three months of potentially impacting construction work being completed near you, we'll offer you a **post construction condition survey**.

In the unlikely event that you notice damage to your property, we advise you to get in contact with the Project to initiate the damage claim process straight away even if you haven't had your post construction condition survey completed.

Noise and vibration

Tunnelling can cause ground-borne noise and mild vibration, and it's likely that you'll be able to temporarily hear and feel tunnelling activities as we pass near you.

Prior to tunnelling in an area, we engage noise specialists to carry out modelling to predict noise and vibration levels. Our noise modelling is carried out in line with our Construction Noise and Vibration Management Plan available on the WestConnex website and endorsed by the Department of Planning, Industry and Environment (DPIE).

We validate these predictions by carrying out noise and vibration monitoring on the surface while tunnelling activities are taking place.

What does tunnelling sound like?

The tunnels are excavated using a roadheader which creates a consistent rumbling sound similar to thunder. Once we've excavated the space, we'll install ground support including rockbolts and shotcrete. People don't generally hear shotcreting however they may notice the rock bolting which creates a short drilling noise.

While it's likely that you'll hear tunnelling, the degree to which the noise may disrupt you will depend on

- the depth and location of the tunnel
- construction activities being undertaken
- the materials used to build your house
- the existing background noise levels
- personal sensitivity to ground-borne noise

The type of construction activity being carried out and our location within the tunnels will also influence whether or not the noise is audible from your property.

Tunnelling can cause walls and floors to vibrate and radiate noise. However, while vibration from tunnelling may be noticeable, it's not expected to cause any cosmetic or structural damage.

Generally, ground borne noise and vibration impacts from tunnelling are most noticeable when we're closest to a property, increasing on approach and reducing as we move away.

Will I be able to sleep?

Noise from tunnelling is generally more noticeable at night when background levels are lower. Previous tunnelling projects in Sydney have shown that while people will generally hear and feel excavation close to their property, they are still able to sleep. Sleeping on a higher level in your house (if available) can reduce the impacts of ground-borne noise. Other mitigation options could include earbuds, white noise or headphones.

When we're tunnelling directly under a property, the noise is expected to be the greatest. Generally, when we're working directly under a property, we predict noise levels in the range of 35-45 decibels, inclusive of background noise.

Any properties that are predicted to experience noise levels over 45 decibels will be contacted directly by the Project to discuss respite options in accordance with the Environmental Protection Licence.

Am I eligible for alternative accommodation?

We're quite often asked about the decision to relocate people from tunnelling noise. We provide residents with alternative accommodation based on noise modelling results whereby a property is expected to experience noise **above 45 dBA for more than two consecutive nights**. If you are modelled to experience noise above 45 dBA for more than two consecutive nights, we'll contact you directly to discuss alternative accommodation options.

Pets

Some pets, particularly dogs, can be more sensitive to ground-borne noise from tunnelling. One of the most effective ways of limiting the impact is by placing your pet outside, if possible. This removes them from the vibrations that are passing through your house. Your vet may have other suggestions for your pet.

Further Information

We'll be providing regular updates about tunnelling progress via email.

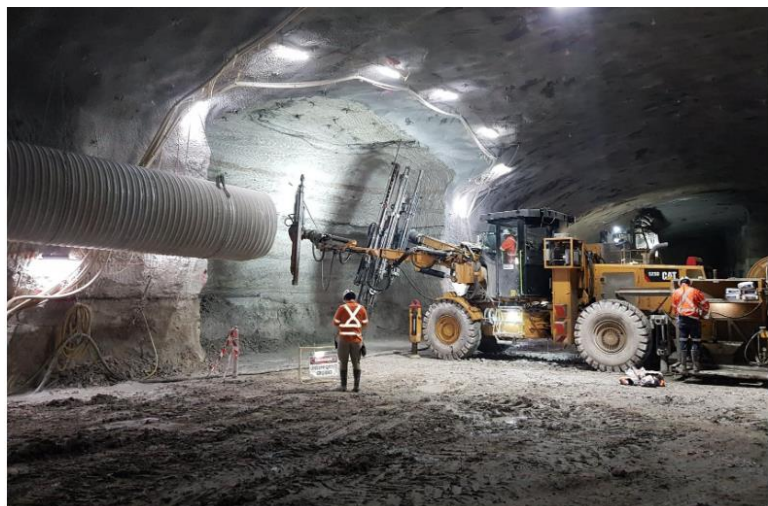
If you haven't done so already, please subscribe to receive email updates at info@rozelleinterchange.com.au

We're always happy to answer any questions or concerns you have about tunnelling. Please feel free to email the above address or call our hotline on **1800 660 248** and ask to speak to a member of the Rozelle Interchange team.

Tunnelling photos



A roadheader inside one of our traffic tunnels. The roadheader cuts the rock using a rotating head on a moving boom as shown in the image



Following roadheader excavation, rockbolts are drilled into the tunnel roof for ground support



The tunnel roof being sprayed with concrete for ground support, also known as Shotcreting