



# Tunnelling with tunnel boring machines



Artist impression of The Metro Tunnel Project's first tunnel boring machine

The Metro Tunnel Project will deliver twin nine kilometre rail tunnels from Kensington to South Yarra as part of a new end-to-end Sunbury to Cranbourne/Pakenham line. In addition to the tunnel, five new underground stations will be built.

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**Metro Tunnel HQ**

125-133 Swanston Street, Melbourne

## Constructing the tunnels

### Tunnelling between North Melbourne and Kensington, and North Melbourne to the CBD

Two tunnel boring machines (TBMs) are assembled in the station box at the Arden Station site. The TBMs are launched separately, and tunnel towards the new tunnel entrance at Kensington.

During tunnelling, the TBMs pipe the excavated material (slurry) back to the Arden Station site and line the new tunnel with curved concrete segments.

The TBMs arrive at Kensington and are transported back to the Arden Station site. The TBMs are reassembled in the station box and relaunched towards Parkville, before tunnelling towards the CBD.

### Tunnelling between the Domain Precinct and South Yarra, and the Domain Precinct to the CBD

Two TBMs are assembled in the station box at the Anzac Station site in the Domain Precinct (Domain). The TBMs are launched separately and tunnel towards the new tunnel entrance at South Yarra.

During tunnelling, the TBMs pipe the excavated material (slurry) back to site at Edmund Herring Oval in Domain, and line the new tunnel with curved concrete segments.

The TBMs arrive at South Yarra and are transported back to the Anzac Station site. The TBMs are reassembled in the station box and relaunched towards the CBD, under the Yarra River.

TBMs tunnelling in the west

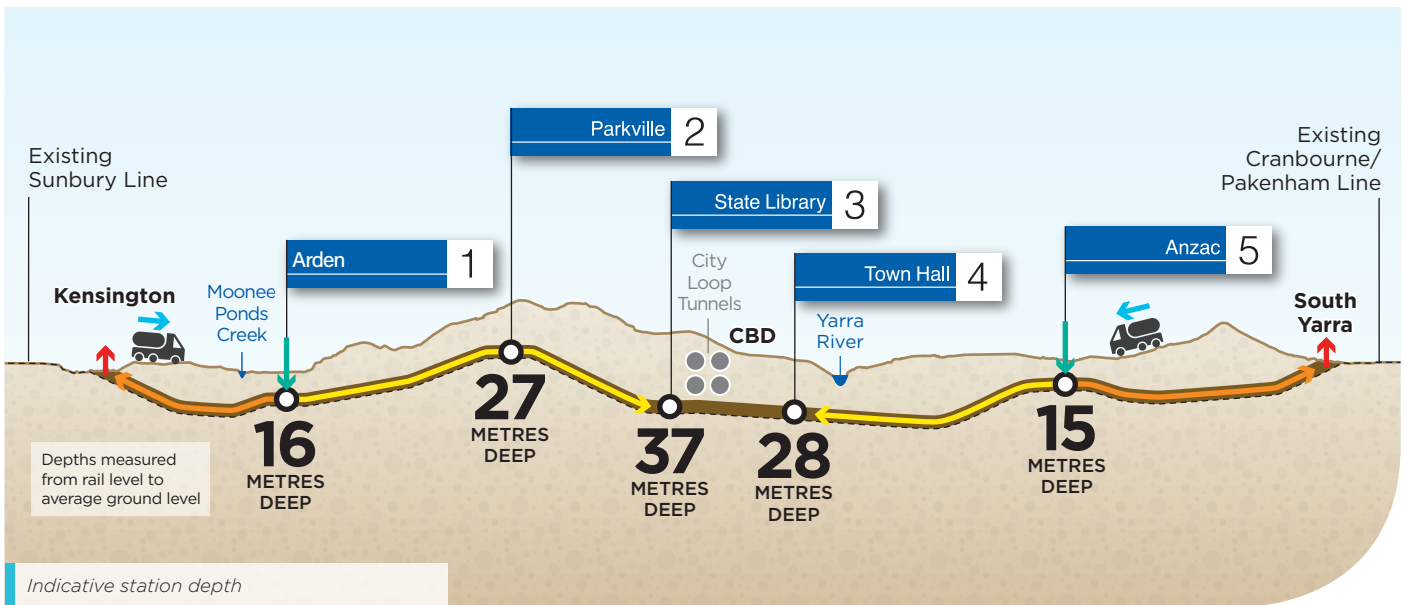


TBMs tunnelling in the east



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### What type of TBMs will be used for the Metro Tunnel?

A TBM is a machine that is used to excavate tunnels. TBMs can bore through a variety of ground conditions, from hard rock to sand.

The Metro Tunnel Project will use mixshield TBMs – commonly known as slurry TBMs – that are purpose-built to suit the local ground conditions along the tunnel alignment. Once the TBMs cutterhead bores through the ground, the excavated material will be mixed with slurry and transported back to the aboveground slurry treatment plant.

The excavated material will be separated from the slurry and transported to a disposal site.

To construct the tunnels, the TBMs will progressively line each tunnel with curved concrete segments. The twin tunnels will comprise 56,000 individual concrete segments.

Each TBM is equipped with a state-of-the-art navigation system that will ensure accurate tunnel alignments are achieved.

### What is the geology like?

The geology of the area is extremely variable. The TBMs will be required to excavate through very soft soils such as Coode Island Silt, and very hard basalts under the Yarra River and in some sections of the western alignment. Many sections of the tunnel alignment feature a ‘mixed-face’ geology, which is both parts hard and soft.

### How big are the TBMs?

Each TBM is 7.28 metres in diameter, 120 metres long and weighs more than 1,100 tonnes. The heaviest component is the cutterhead, which weighs 100 tonnes.

### How fast do the TBMs travel?

On average the TBMs will move around 10 metres every 24 hours.

### How many people will be operating each TBM?

A crew of up to 10 people, including a TBM operator, will work on the TBM at any one time.

### Managing noise and vibration during tunnelling

Managing noise and vibration during tunnelling will be based on a best practice approach as undertaken by Metro Tunnel’s contractors on similar projects around the world.

Prior to tunnelling, comprehensive geological testing and environmental assessments are completed.

Property condition surveys will be offered to properties based on an environmental assessment.

Properties located near the path of the TBMs may experience low levels of noise or vibration, however individuals experience noise and vibration differently. During tunnelling, noise, vibration and ground movement will be managed in line with strict Environmental Performance Requirements.

Properties located near the path of the TBMs will be contacted with further information prior to tunnelling commencing in their area.

### More information

To find out more about the Metro Tunnel Project and register for future email updates:

[metrotunnel.vic.gov.au](http://metrotunnel.vic.gov.au)

1800 105 105 (24 hours a day, 7 days a week)  
Press 2 and follow the prompts

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