

Westmead to The Bays and Sydney CBD

Environmental Impact Statement Summary

2020



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About Sydney Metro

Sydney Metro is Australia's biggest public transport project, revolutionising the way Sydney travels.

Metro services started in May 2019 on the Metro North West Line between Rouse Hill and Chatswood.

The line is being extended into the city and beyond to Bankstown by 2024, when Sydney will have 31 Sydney Metro stations and 66 kilometres of new metro rail.

As part of the NSW Government's Transport cluster, Sydney Metro is responsible for the planning, construction, delivery and operation of metro rail services.

The Sydney Metro West project will support a growing city and deliver world-class metro services to more communities.

This new underground railway will connect Greater Parramatta and the Sydney central business district (CBD). This once-in-a-century infrastructure investment will transform Sydney for generations to come, doubling rail capacity between the two CBDs, linking new communities to rail services and supporting employment growth and housing supply.

The locations of seven proposed metro stations have been confirmed at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock and The Bays.

The NSW Government is continuing to assess an optional station at Pyrmont and further planning is underway to determine the location of a new metro station within the Sydney CBD.

The Sydney Metro West environmental assessment process

The environmental assessment process for Sydney Metro West will be staged in recognition of the size of the project. This includes:

The Concept application (this approval) seeks approval for construction and operation of a Sydney Metro line from Westmead to the Sydney CBD. Specific construction works as they relate to the Concept would be assessed as part of separate planning approvals.

The Stage 1 application (this approval) seeks approval for all major civil construction works between Westmead and The Bays, including station excavation and tunnelling.

The Stage 2 application (future approval) is expected to seek approval for all stations, depots and rail systems between Westmead and The Bays.

The Stage 3 application (future approval) is expected to seek approval for all major civil construction works including station excavation, tunnels, stations, depots and rail systems between The Bays and the Sydney CBD Station.

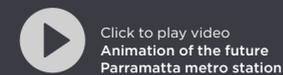
This document provides:

- a summary of the Environmental Impact Statement for the Sydney Metro West Project Concept and Stage 1 (the Environmental Impact Statement)
- a summary of the project corridor and proposed tunnel alignment.

The full Environmental Impact Statement, and supporting documents is available at:

planningportal.nsw.gov.au/major-projects

An interactive portal with key information about the project is also available at: sydnymetro.info/metrowest



Sydney Metro respectfully acknowledges the traditional owners and custodians of this great land and we pay our respects to Elders past, present and future, extending this respect to all Aboriginal and Torres Strait Islander peoples.

Cover: Artist's impression of Parramatta metro station.
Right: Sydney's new metro train with automated platform screen doors, designed to keep passengers safe.





Premier's message



Sydney Metro is changing lives – right now. In 2019, the NSW Government delivered the North West Metro – the city's first metro line. Already, more than 75,000 people have been using it on weekdays – taking cars off the roads and making it faster and easier to get to more places.

The Western Sydney metro project will change the way of life for millions of people across Greater Western Sydney.

Fast, safe and reliable metro trains with a trip time of about 20 minutes between Parramatta and the Sydney CBD.

We're doubling the rail capacity between these two centres.

As we get on with the job of delivering this mega project, I encourage you to have your say.

Gladys Berejiklian MP
Premier of New South Wales

Artist's impression of Westmead metro station.

Minister's message



Like the Sydney Harbour Bridge a century ago, Sydney Metro West is a true city-shaping project. It will change how we get around Sydney – more jobs will be closer to more people, cutting travel times and delivering more opportunities to work, visit and live.

Sydney is expanding and the NSW Government is working hard to deliver an integrated transport system that meets the needs of customers now and in the future.

The NSW Government is proud that projects such as Sydney Metro West will create approximately 10,000 direct and 70,000 indirect jobs.

Since 2011, community engagement has been a hallmark of Sydney Metro – our projects have changed for the better following your feedback.

Please have your say as we deliver the Sydney Metro West project, a project which will improve the lives of the community for generations to come.

Andrew Constance MP
Minister for Transport and Roads
Leader of the House



About Sydney Metro

Artist's impression of The Bays Station.

Sydney Metro is Australia's biggest public transport project

A new generation of fast, safe and reliable metro trains.

- Australia's first fully accessible railway: level access between the platform and train.
- Heating and air-conditioning in all metro trains.
- New driverless technology, including platform screen safety doors keeping people and objects like prams away from tracks.
- At all times, a team of expert train controllers will monitor Sydney Metro, making sure everything runs smoothly.
- Wheelchair spaces, separate priority seating and emergency intercoms inside trains.
- Continuous mobile phone coverage throughout the metro network.

Slashing travel times



Sydney Metro West will have a travel time target of around **20 minutes** between Parramatta and the Sydney CBD.

Sydney Metro opened in Sydney's North West in May 2019

Metro services are already connecting people in the city's north west between Rouse Hill and Chatswood, and in 2024 metro will extend into the CBD and on to Bankstown in the south west.

Metro North West Line opening day at Tallawong Station, 26 May 2019.



The biggest urban rail project in Australian history

North West Metro 

Opened 26 May 2019

- 13 stations
- 4,000 commuter car parks
- 36 kilometres

City & Southwest 

Opening 2024

- 18 stations
- New CBD connections
- 30 kilometres, including under Sydney Harbour

West 

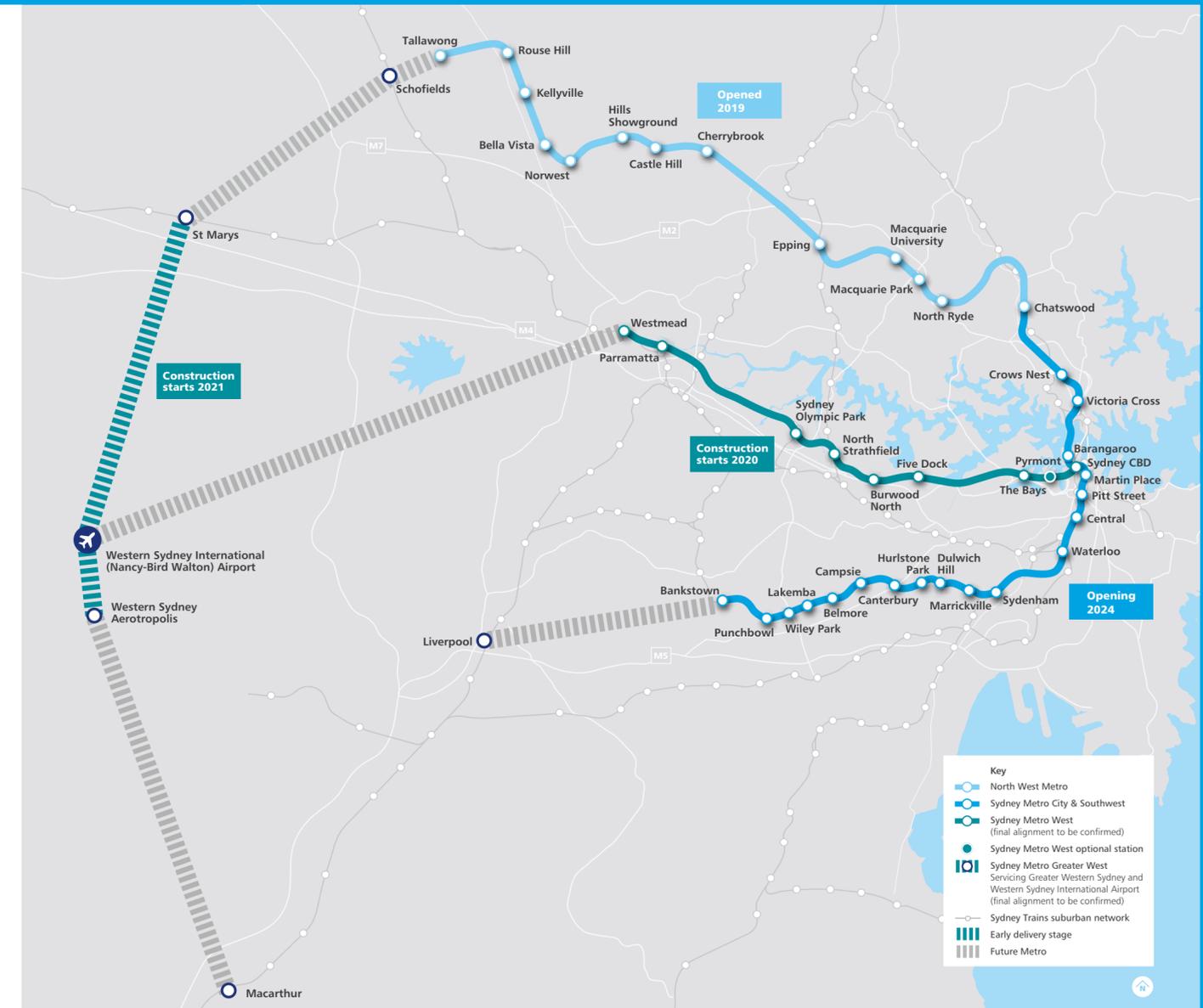
(final alignment to be confirmed)

- 8 stations
- Connecting Greater Parramatta and the Sydney CBD
- 3.2 million Western Sydney population, 2036

Greater West 

(final alignment to be confirmed)

- Connecting Western Sydney Airport to the rest of Sydney
- Servicing Greater Western Sydney
- Opening together with new airport



Key

- North West Metro
- Sydney Metro City & Southwest
- Sydney Metro West (final alignment to be confirmed)
- Sydney Metro West optional station
- Sydney Metro Greater West
- Servicing Greater Western Sydney and Western Sydney International Airport (final alignment to be confirmed)
- Sydney Trains suburban network
- Early delivery stage
- Future Metro

Our customers

Sydney Metro opened on 26 May 2019. Metro North West Line, Australia's first fully-automated driverless railway, was delivered on time and \$1 billion under its budget.

With 13 metro stations and 4,000 new commuter car parking spaces, a new generation of metro trains runs every four minutes in the peak in each direction. Customers don't need a timetable, they just turn up and go.

Sydney Metro is designed to be an easy part of daily journeys

State-of-the-art technology keeps customers connected at all stages of their journey – from smart phone travel apps on the way to stations to real-time journey information at metro stations and on board trains.

Sydney Metro stations are fully accessible for people with reduced mobility, people with prams, and children. This includes level access between platforms and trains and lifts at all stations.

Platform screen doors on all metro platforms keep people and objects away from the edge, improving customer safety and allowing trains to get in and out of stations much faster.

These doors run the full length of the platforms and only open at the same time as the train doors.

Sydney Metro is the first railway network in Australia to use platform screen doors, which are common around the world.

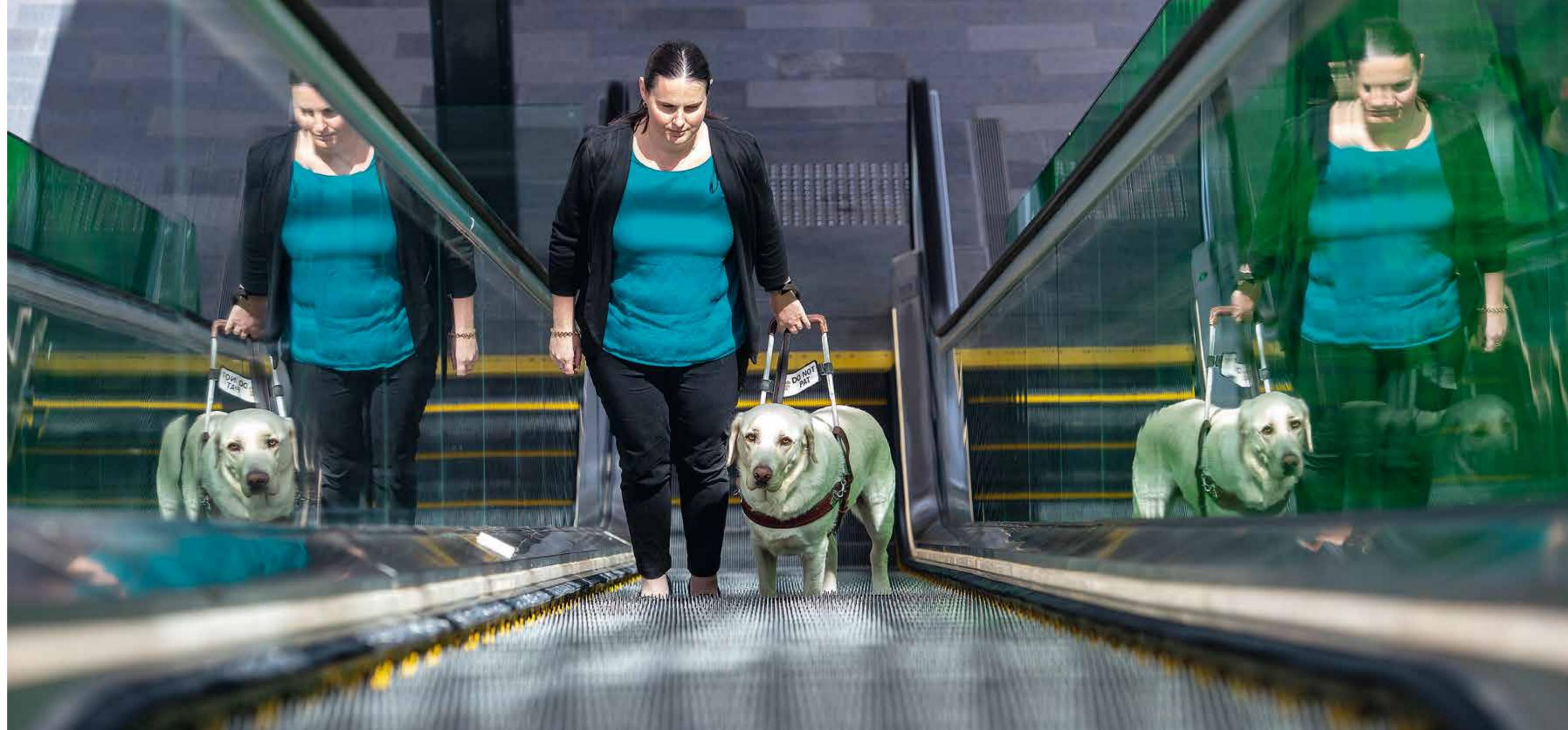
All stations are designed to reflect the character of the local areas they serve and, where possible, include environmentally friendly features such as solar panels, natural light and ventilation. New metro services will be integrated with other transport modes, including interchanges with Sydney suburban rail as well as buses, light rail and ferries.

Customer safety is the number one priority for Australia's first fully-automated railway. At all times, a team of expert train controllers monitor the system, making sure everything runs smoothly.

Sydney Metro is Australia's first fully accessible railway

Every Sydney Metro train, station and interchange is fully accessible – from drop-off points, through the concourses, to platforms and onto trains. Wheelchair and pram users can access the metro train at any door, and once on board, they can move throughout the whole train.

Tallawong Station.

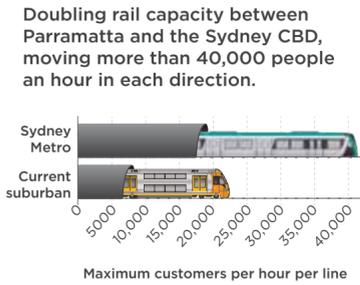




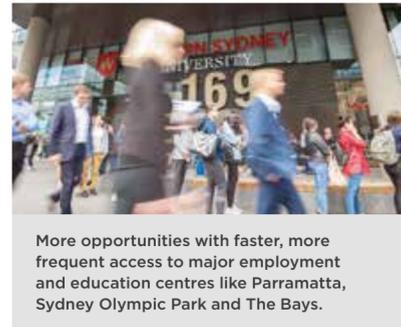
Sydney Metro West

Artist's impression of Burwood North Station.

A new metro railway connecting Greater Parramatta to the Sydney CBD



Sydney Metro infrastructure, like the stations, trains and railway tracks, is owned by the NSW Government.



More opportunities with faster, more frequent access to major employment and education centres like Parramatta, Sydney Olympic Park and The Bays.



Sydney Metro uses Opal ticketing and fares that are set by the NSW Government, the same as the rest of the Sydney public transport network.



A new metro station at Westmead – one of Australia's largest health and education precincts.



Integrated with the rest of Sydney's public transport system.



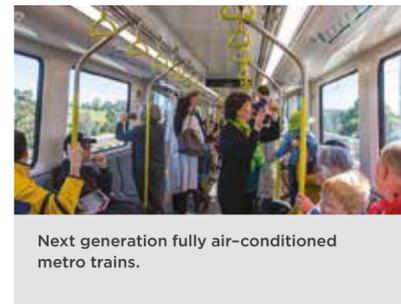
All Sydney Metro stations are fully accessible, with lifts and level access between trains and platforms.



Delivering new rail services for the first time to Burwood North, Five Dock and The Bays.



A new metro station at Sydney Olympic Park – Sydney's sporting and entertainment super-precinct.



Next generation fully air-conditioned metro trains.



Growing with the West

Supporting a 30-minute city

The Greater Sydney Commission's 'Towards our Greater Sydney 2056' outlines how the city is planning for future decades.

Consistent with the 30-minute cities concept, where people across the city can access their nearest city centre in 30 minutes by public transport, the NSW Government is investing in significant new infrastructure projects designed to deliver a renewed urban environment for Sydney that changes the patterns of where people live and work, how they enjoy their spare time and how they travel.

Sydney Metro West will support well-connected and vibrant places that re-imagine Western Sydney and reduce the traditional reliance on long-haul, peak-hour-only commutes to and from major employment centres.

Future Transport 2056

The NSW Government's 'Future Transport 2056' strategy, which sets the 40 year vision, directions and outcomes framework for customer mobility in NSW, supports the 30-minute cities concept and builds on the 2012 NSW Long Term Transport Master Plan, which has guided unprecedented investments in transport services and infrastructure across NSW.

Sydney Metro West is a critical step in the delivery of the 'Future Transport 2056' strategy, along with other initiatives like Parramatta Light Rail, and improvements to the suburban rail system through programs like 'More Trains, More Services'.

The Future Transport 2056 strategy is available at: future.transport.nsw.gov.au

A focus on better connecting Western Sydney

Sydney Metro West will make it faster and easier to get to Parramatta from both the east and west.

From the east, this new stand-alone metro will become the easiest and fastest journey within the growing corridor and between the Parramatta and the Sydney CBD, moving more than 40,000 people an hour in each direction and doubling the current rail capacity.

This frees up capacity on existing suburban rail to the west, increasing reliability of services to and from areas like Blacktown, Penrith and the Blue Mountains.

Aerial view of Parramatta.

The need for Sydney Metro West

Sydney Metro will make it easier and faster to get around, boosting economic productivity by bringing new jobs and educational opportunities closer to home. Sydney is a global city that will experience significant population and employment growth in the coming decades. Investment in public transport will play an important role in supporting this growth, ensuring Sydney's future liveability and global competitiveness.

Greater Sydney's population will pass 6 million by 2036; an extra 1.7 million people will progressively move into Australia's biggest city, which will support 840,000 more jobs.

Sydney Metro West is expected to take **tens of thousands of cars off Sydney roads every day** including about

83,000 fewer car trips

every weekday by 2036, and about

110,000 by 2056



Five Dock.

Creating new jobs



Sydney Metro West is expected to create approximately

10,000 direct

and

70,000 indirect jobs



Demand for public transport between Greater Parramatta and the Sydney CBD by 2036



Public transport demand will **increase by 36%** in the AM peak



3.2 million people

will live in Western Sydney - that's about 50 per cent of Sydney's population



420,000 people

will move into the corridor

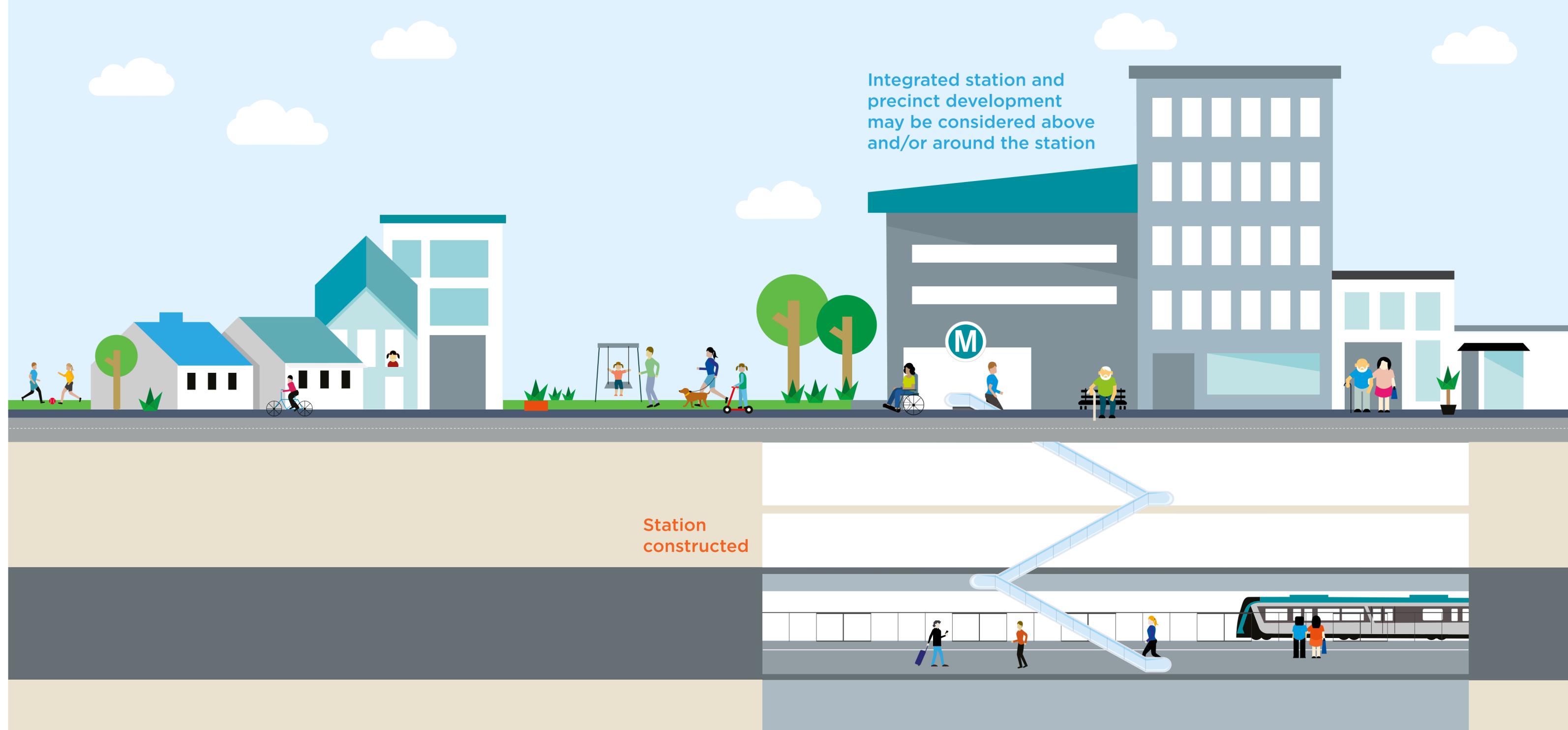
Creating places

Integrated station and precinct developments

New metro stations create opportunities to provide for community needs in consideration of the future vision, relevant planning controls and local character of each area. An integrated station and precinct development is made up of the metro station and building(s) above and/or around the station that could deliver a range of uses like community facilities, new homes and green space, shops, restaurants and commercial office spaces. Provisions for station and precinct developments are being made for:

- Westmead
- Parramatta
- Sydney Olympic Park
- Burwood North
- Five Dock
- The Bays
- Sydney CBD.

All future integrated station and precinct developments would be subject to separate planning approval processes and would include community and stakeholder engagement.



A city shaping project

Sydney Metro West will deliver more than just railway stations. Through excellence in design and delivery, new places will:

- respond to the community's needs
- be architecturally unique and easy to get around
- be intuitive and safe, and promote people's health and wellbeing.

Through urban design principles and placemaking, Sydney Metro West precincts will become the centre of communities and provide for a variety of uses.

Sydney Metro will work closely with communities on how best to integrate stations that are thriving, welcoming hubs for everyone to enjoy with new places for people to live, work, shop and play – and public spaces designed to encourage walking, cycling and social interaction. The stations will be vibrant places and landmarks in their own right, building on the local character of each area.



Artist's impression of Five Dock Station.



About the Environmental Impact Statement

Aerial view of Sydney Harbour, with The Bays in the foreground.

The Environmental Impact Statement public exhibition

This document is a summary of the Westmead to The Bays and Sydney CBD Environmental Impact Statement (the Environmental Impact Statement). Sydney Metro is making the Environmental Impact Statement and supporting materials as easy to access as possible.

- Visit planningportal.nsw.gov.au/major-projects to view the full Environmental Impact Statement.
- Visit sydnymetro.info to learn more about Sydney Metro and sign up for email alerts.
- Visit sydnymetro.info/metrowest to view an interactive map of the project, find out what you can expect in your area and learn from expert members of the project team.
- Call us on **1800 612 173** to talk to one of our dedicated place managers.
- Email your queries to sydnymetrowest@transport.nsw.gov.au and we'll get back to you.

The Sydney Metro team, including our team of project experts, are here to provide you with information about Sydney Metro, and to help you find out more about the Environmental Impact Statement. If you are having difficulty accessing any of the information available please contact us and we'll make arrangements to assist you.

Sydney Metro West environmental assessment process

The environmental assessment process for Sydney Metro West will be staged in recognition of the size of the project. This includes:

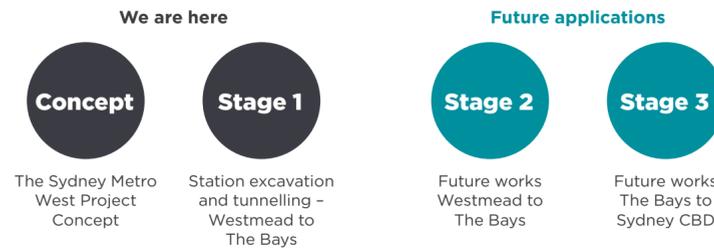
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Environmental assessment staging



Centenary Square, Parramatta.



The Concept and Stage 1 planning process



The Sydney Metro West Project Concept from Westmead to the Sydney CBD and Stage 1 works between Westmead and The Bays will be assessed under the Environmental Planning and Assessment Act 1979 (NSW) before any major construction can start.

The Environmental Impact Statement is presented in two volumes. Volume One contains the main Environmental Impact Statement and Volume Two contains technical papers that form the basis of the information included in Volume One.

The primary focus of the Environmental Impact Statement is to identify strategies to avoid, mitigate and manage potential impacts to the environment and the community.

The project team would continue to work with local communities, businesses and stakeholders to help determine appropriate mitigation measures that could be adopted where feasible and reasonable to further minimise impacts.

The Environmental Impact Statement is on public exhibition until **26 June 2020**.

During the exhibition period, anyone may make a submission in any language, and these submissions will be considered by the Department of Planning, Industry and Environment in its assessment of the project. For more information on how to make a submission, see page 89.

The Department of Planning, Industry and Environment will provide Sydney Metro with a copy of all submissions received during the exhibition period.

Sydney Metro will review all the submissions and prepare a Submissions Report to respond to issues raised. If changes are required as a result of the issues raised, a Preferred Infrastructure Report may also be prepared.

Approval from the Minister for Planning and Public Spaces is required before Sydney Metro can proceed with the project.

Design development and community and stakeholder engagement to minimise environmental issues

Early community and stakeholder input has been key to identifying potential impacts. By examining potential environmental issues as part of early design development, the project has avoided or minimised impacts where possible.

For example, early design development identified that locating the railway underground would substantially avoid or reduce a number of potentially major environmental impacts including noise, traffic, property and land use, biodiversity and social impacts.

Design development is an ongoing process with continued community and stakeholder input. A number of investigations would also be carried out prior to any construction occurring and adjustments would be made accordingly.

Traffic and transport

Keeping local areas moving

Sydney Metro would keep the road network moving during construction by adopting site-specific traffic management plans to minimise temporary impacts. This may include adjusting haulage routes and timing trucks to minimise movements during peak times and school drop-off and pick-up. Sydney Metro would coordinate and agree traffic management plans in consultation with the relevant road authorities.

Specific traffic management plans would be applied during large or special events including events at Sydney Olympic Park or within the Parramatta CBD. This may include temporary adjustments to haulage routes and working hours, or temporarily stopping work in some cases.

Measuring traffic and transport

An assessment was carried out for all sites between Westmead and The Bays to measure existing traffic levels with the addition of proposed construction traffic and the effects that traffic changes – like temporary road closures and detours – would have on the traffic network. The assessment considered the existing road network including bus, pedestrian and cycle routes.

The road network and buses

Our assessment concluded that the project would not result in any significant impacts to local or arterial road networks. In some areas additional traffic and road changes could potentially result in more congestion and longer waits at intersections. This would be temporary and most prominent in areas that already have existing high traffic volumes.

Construction work would require the relocation of bus stops and include changes to bus routes in some locations. Changes to bus stops and bus routes would be carried out in consultation with stakeholders, and the project team would ensure commuters are provided with information about changes to bus stops in advance of any changes occurring.

Pedestrians and cyclists

Pedestrian and cycle routes would be largely unchanged and changes would generally be restricted to temporary closures of footpaths near construction sites. Alternative arrangements would be made during construction, such as diversions onto footpaths to maintain access.

Traffic and pedestrian safety

Safety is our number one priority at Sydney Metro and appropriate controls would be established to ensure the safety of local communities. Where vehicles would be required to cross footpaths to access construction sites, manual supervision, physical barriers or temporary traffic lights would be used as required.

Haulage routes

Designated haulage routes would be used by trucks to transport materials to and from construction sites. The proposed routes have been designed in consultation with relevant road authorities using the following principles:

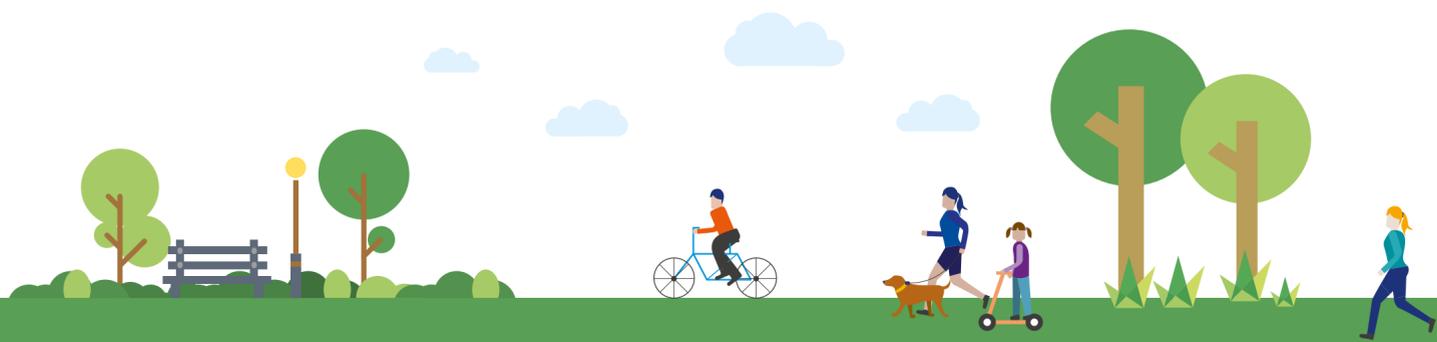
- minimising the use of local and residential streets and maximising the use of arterial roads where possible
- minimising potential interfaces with pedestrians, cyclists and other road users as much as possible.

More information about traffic and transport

Site-specific details are outlined in the tables in 'Stations and sites' on pages 55 to 75 and further information about traffic and transport can be found at planningportal.nsw.gov.au/major-projects or in Chapter 10 of the Environmental Impact Statement.



Aerial view of Sydney Olympic Park.



Noise and vibration

Managing noise and vibration

Understanding potential noise and vibration levels means we can plan to use measures aimed at reducing temporary impacts on the community during construction.

Common mitigation measures for noise and vibration can include:

- providing scheduled respite periods during which high noise or vibration activities are not undertaken
- using physical barriers to dampen noise
- adopting alternative construction methodology where possible.

Sydney Metro would manage temporary vibration impacts by ensuring vibration levels from excavation and tunnelling are within limits identified as appropriate for properties and structures above the tunnel alignment and around stations and construction sites.

We do this by conducting a detailed and ongoing assessment of the ground conditions and engaging structural engineers and heritage specialists as required to assess buildings. Specific assessments can also be carried out for buildings with specialised uses, like those that contain sensitive medical equipment.

Property condition surveys would be offered to properties neighbouring construction sites or above the tunnel alignment to identify any pre-existing conditions prior to construction or tunnelling works. We strongly encourage those people offered a survey to take up this offer.

People are generally more sensitive to vibration, and it is possible that people who live or work near construction sites, or are above the tunnel alignment, would feel vibration when vibration-intensive equipment is in use during construction, even when levels are within appropriate limits. To manage this impact we would work with local communities to provide suitable respite periods.

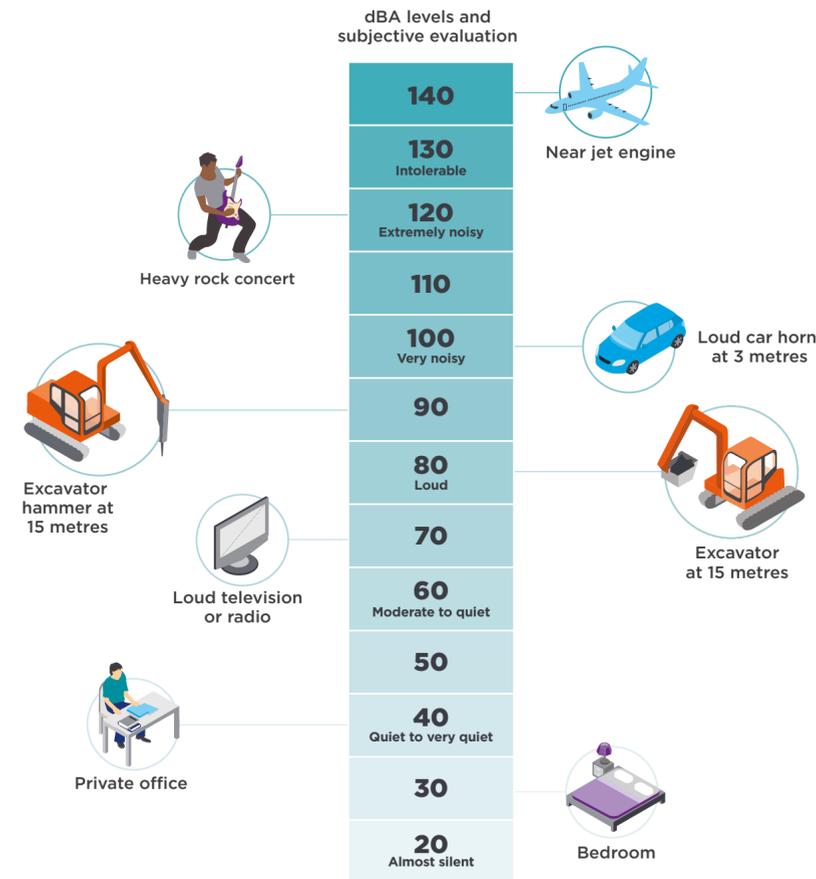
Assessing noise and vibration

Potential temporary noise and vibration impacts were assessed for a number of proposed construction activities associated with the proposed tunnel alignment and at each site between Westmead and The Bays. This assessment used a model to predict how construction noise and vibration levels would compare with existing background or guideline levels. Predictions were made across the day, evening and night.

Site establishment

Site establishment works would include relocation of utilities, installation of piles, initial excavation, demolition and any work required to modify the local transport network.

Most of these works would be carried out during the day. However, works to relocate utilities and modify the local transport network can often only be done in the evening or at night, when there is less traffic. These types of works are expected to have short-term intermittent high-noise impacts with some of the works potentially requiring the temporary use of saw cutters or rock hammers. Noisier works would be planned for as early as possible in the evening to minimise impacts on the local community.



Note:

- A change of 1 dBA or 2 dBA in the level of a sound is difficult for most people to detect.
- A 3-5 dBA change corresponds to a small but noticeable change in loudness.
- A 10 dBA change corresponds to an approximate doubling or halving in loudness.

Excavation of stations or shafts

Excavation works to dig the stations or shafts would be undertaken once construction sites have been prepared. Excavation works would require the use of some noise and vibration-intensive equipment like rock hammers. To minimise impacts, works would generally occur during the day unless appropriate measures, like a sealed acoustic shed, could be installed over the worksite to dampen noise during the evening or night. The project team may also consider other construction methodology that could minimise the intensity and/or duration of community impacts.

Tunnelling

The Sydney Metro West tunnels would be 38 metres deep on average – that’s about 13 storeys below ground. Tunnel boring machines (TBMs) would be launched from both Westmead and The Bays once excavation of the station boxes is complete. The TBMs would then be retrieved from Sydney Olympic Park.

TBMs need to operate continuously so tunnelling works would occur 24 hours a day, seven days a week and could be a temporary source of ground-borne noise and vibration for a few days as they pass by underground.

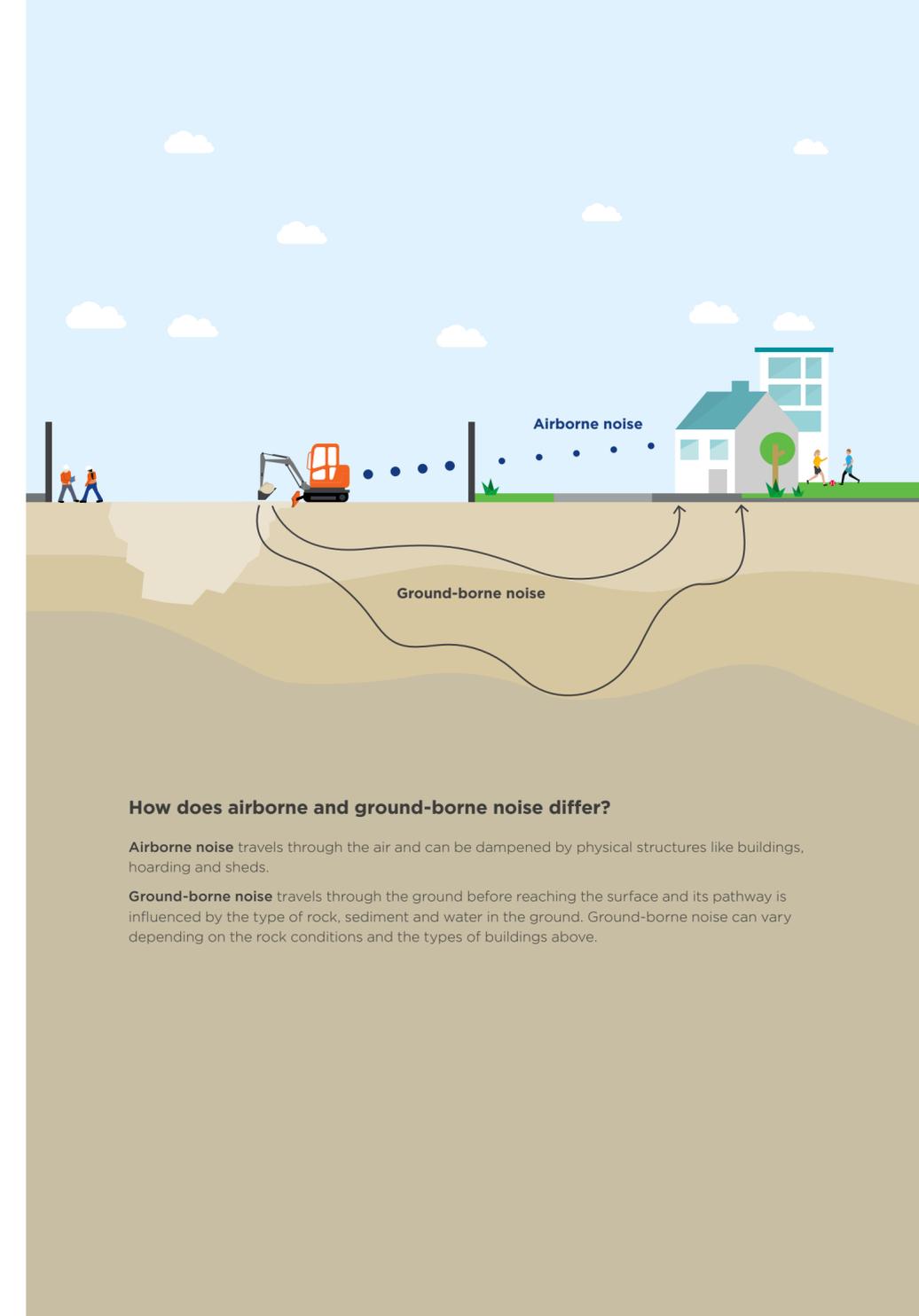
Movement of the TBMs could be more noticeable at night when other noise and movement levels are lower.

These works are predicted to be more noticeable near stations and sites where the tunnel would generally be shallower than elsewhere.

Roadheaders and/or rock hammers would also be used underground to dig crossover caverns and passages between the tunnels. This work is for short sections only and is planned to be undertaken 24 hours a day, seven days a week. Works requiring the use of rock hammers would be planned to occur during the day and as early as possible in the evening to minimise impacts on the local community.

More information about noise and vibration

Site-specific potential impacts are outlined in the tables in ‘Stations and sites’ on pages 55 to 75 and further information about noise and vibration can be found at sydneymetro.info/metrowest or in Chapter 11 of the Environmental Impact Statement.



How does airborne and ground-borne noise differ?

Airborne noise travels through the air and can be dampened by physical structures like buildings, hoarding and sheds.

Ground-borne noise travels through the ground before reaching the surface and its pathway is influenced by the type of rock, sediment and water in the ground. Ground-borne noise can vary depending on the rock conditions and the types of buildings above.

Heritage

Where possible, the project is designed to enhance and protect items of heritage significance.

A heritage assessment was conducted as part of the Environmental Impact Statement. This included consultation with heritage specialists to identify local and State heritage listed items in proximity to the project. The assessment also considered the likelihood of uncovering Aboriginal heritage artefacts within the construction sites.

Management and mitigation measures would be used where impacts to heritage items have been identified. This may include conservation and re-use of heritage fabric, and archiving and recording the item for future generations.

Any potential archaeological investigations would be undertaken as required in accordance with Heritage Council guidelines.

Any potential Aboriginal archaeological remains found would be interpreted by an Aboriginal heritage specialist in consultation with registered Aboriginal parties.

Non-Aboriginal heritage

A number of identified heritage items would be protected during project construction, including the Kia Ora building at Parramatta, and there would be no direct impacts to heritage listed buildings.

A small number of direct heritage impacts to landscaped or natural areas have been identified at Clyde, Sydney Olympic Park, North Strathfield and The Bays.

The works may also potentially result in indirect impacts to heritage items near to construction sites, including changes to visibility – such as views becoming partially obscured as a result of construction equipment.

Throughout detailed design development, the project team would look for opportunities to further minimise impacts to known heritage items.

Archaeological remains are largely unexpected across the project. It is possible that archaeological remains could be uncovered at Parramatta or The Bays, in association with the earliest phases of European settlement.

Aboriginal heritage

It is unlikely that Aboriginal archaeological remains would be found at the majority of sites. However there could be the potential for Aboriginal archaeological remains to be found at Parramatta, Clyde and The Bays.

More about heritage

Site-specific potential impacts are outlined in the tables in 'Stations and sites' on pages 55 to 75 and further information about heritage can be found at [sydneymetro.info/metrowest](https://www.sydneymetro.info/metrowest) or in chapters 12 and 13 of the Environmental Impact Statement.

Uncovering heritage artefacts at Blues Point on the Sydney Metro City & Southwest project.



Nearby projects

Sydney is expanding and the NSW Government is working hard to deliver an integrated transport system that meets the needs of customers now and in the future.

Sydney Metro is committed to working closely with other nearby projects, local councils, NSW Government agencies and stakeholders to manage and coordinate construction activities and traffic, to help minimise impacts on the community.

The Environmental Impact Statement identifies a number of projects near to the proposed Sydney Metro West construction sites and considers coordination measures like traffic and construction management forums focussed on reducing cumulative impacts on the community.

Other projects identified near Sydney Metro West construction sites are outlined in the tables in 'Stations and sites' on pages 55 to 75 and can also be found at: [sydneymetro.info/metrowest](https://www.sydneymetro.info/metrowest) and in chapters 10–26 of the Environmental Impact Statement.

Local landscape and character

The new stations would be designed to reinforce their role as new vibrant spaces and destinations within the communities that they serve. The stations would provide a catalyst for the regeneration of the surrounding neighbourhoods and will integrate with the surrounding urban fabrics, bringing to life local placemaking.

During construction there would be temporary visual changes near worksites and compounds. These changes include the removal of buildings within construction sites to make way for new metro stations and facilities, new site hoardings around construction, and machinery and equipment associated with the construction works.

Where possible the sites would be arranged to minimise visual impacts from construction to the local community, like locating construction equipment behind hoardings.

Opportunities for the retention and protection of existing street trees and trees within construction sites would be identified prior to construction, along with opportunities to replace trees in the nearby communities in consultation with local councils, however some trees would require removal to facilitate the works.

Site-specific potential impacts are outlined in the tables in 'Stations and sites' on pages 55 to 75 and further information about landscape and visual amenity can be found in Chapter 15 of the Environmental Impact Statement.

Property acquisition

In designing major infrastructure projects, Sydney Metro makes every possible effort to avoid the need to acquire private property. In some cases, however, there is no alternative but to purchase properties to allow for construction of a project. Sydney Metro is committed to working closely with affected property owners and tenants during property acquisition to provide support, and to make sure the process is as easy as possible. Our personal and acquisition managers have made contact with any owner or tenant whose property is directly affected by the project, to answer any questions and provide a point of contact throughout the process.

There are a number of places to find out more information about the Sydney Metro West project and property acquisition process including: [sydneymetro.info](https://www.sydneymetro.info) and [propertyacquisition.nsw.gov.au](https://www.propertyacquisition.nsw.gov.au)

Mitigation measures

Specific measures to manage and mitigate potential environmental impacts have been identified as part of the Environmental Impact Statement. In addition to these, a number of plans and strategies would be developed to manage potential site impacts. These would include the:

- Construction Environmental Management Framework – detailing the approach to environmental management and monitoring during construction
- Construction Noise and Vibration Standard – detailing how construction noise and vibration would be managed across Sydney Metro West
- Construction Traffic Management Framework – providing an overall strategy and approach for construction traffic management, including coordination across projects and NSW Government agencies
- Design Quality Framework – which would be prepared in conjunction with the NSW Government Architect to ensure design quality throughout the project lifecycle.

Mitigation in action

Sydney Metro is committed to thinking outside the box in managing construction impacts and implementing unique and tailored mitigation measures to meet the needs of the community.

Controlled blasting

Controlled blasting is an efficient way to loosen rock prior to excavation, potentially speeding up the excavation process and cutting down on the use and duration of noise and vibration-intensive rock hammering.

Controlled blasting has been used successfully on projects around the world and in Australia including on the WestConnex project and Sydney Metro City & Southwest. This method would be considered for Sydney Metro West.

Controlled blasting involves drilling a series of holes deep into the rock. A series of controlled blasts would then loosen the rock, ready for excavation. Controlled blasting would be strictly regulated and managed by blast management specialists and would be planned to occur at times that would cause the least disturbance to the nearby community.

Sealed acoustic sheds

Sealed acoustic sheds can be installed over noisy construction activities where the site allows and where works are anticipated to be required in the evening or night.

Sealed acoustic sheds have been used on the Sydney Metro City & Southwest project to successfully dampen noise levels experienced by communities close to construction sites.

Sealed acoustic sheds would generally be constructed as early as possible in the construction program to provide maximum benefit throughout the project.

Some activities could not be undertaken inside the acoustic sheds – like loading and unloading heavy vehicles and operating ventilation systems and water treatment facilities. There would also be times when noise could increase temporarily if acoustic shed doors need to be opened to let materials or machinery inside.

An acoustic shed used on the Sydney Metro City & Southwest project.





Tunnelling and excavation

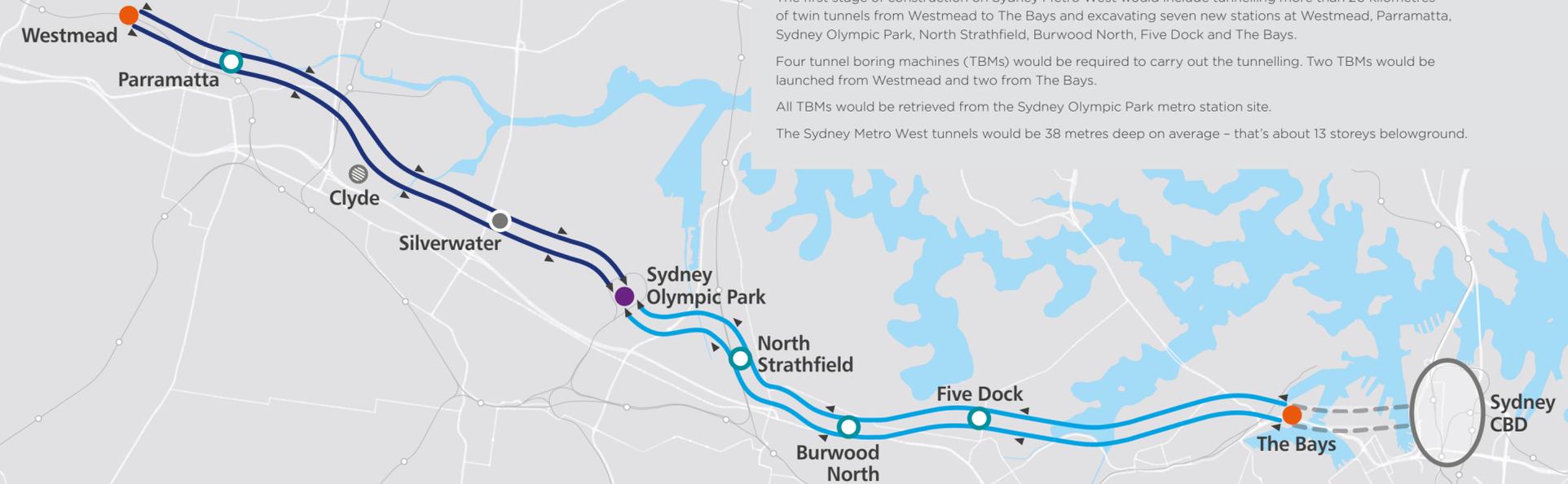
Westmead to The Bays

The first stage of construction on Sydney Metro West would include tunnelling more than 20 kilometres of twin tunnels from Westmead to The Bays and excavating seven new stations at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock and The Bays.

Four tunnel boring machines (TBMs) would be required to carry out the tunnelling. Two TBMs would be launched from Westmead and two from The Bays.

All TBMs would be retrieved from the Sydney Olympic Park metro station site.

The Sydney Metro West tunnels would be 38 metres deep on average - that's about 13 storeys belowground.



Key

- Sydney Metro West station
- TBM launch site
- TBM retrieval site
- Service facility
- Stabling and maintenance facility
- Direction of tunnel construction
- Indicative future tunnel alignment
- Sydney CBD study area

*exact locations of the tunnel between The Bays and the Sydney CBD and the Sydney CBD station would be subject to further environmental assessment.

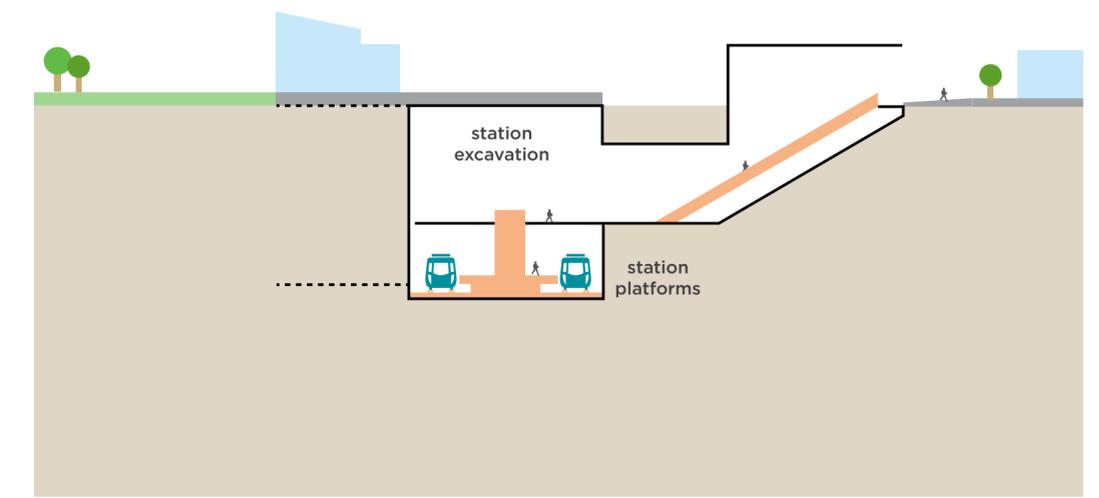
Station excavations

Sydney Metro West stations would be either cut-and-cover or binocular.

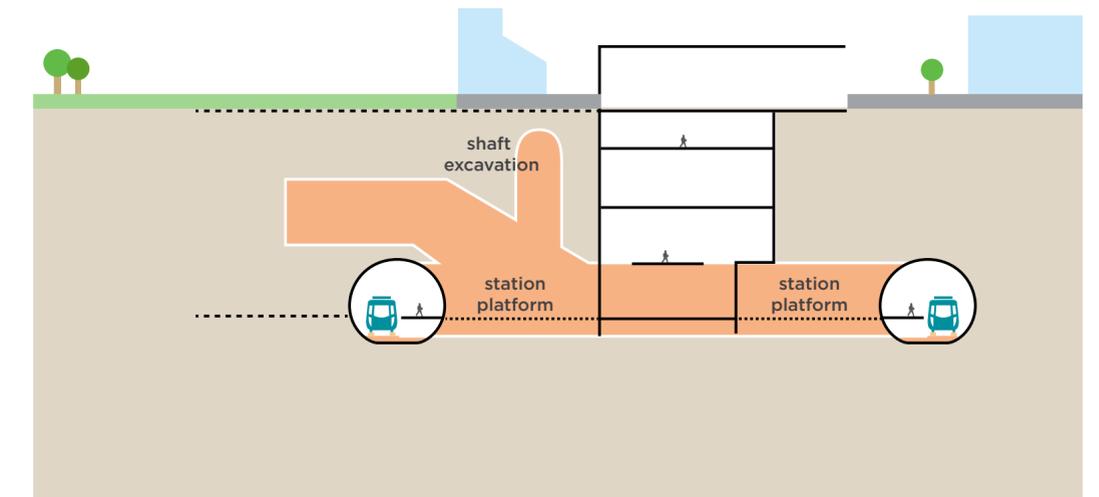
A cut-and-cover station involves excavating a rectangular hole in the ground, which would then house the underground station.

A binocular station involves digging a smaller shaft from ground level to the depth of the station and then mining two underground station caverns.

Each station excavation is chosen based on the unique conditions of the site, including where the tunnels are planned to go, existing building basements and other underground structures.



Cut-and-cover



Binocular

Station excavation and tunnelling staging

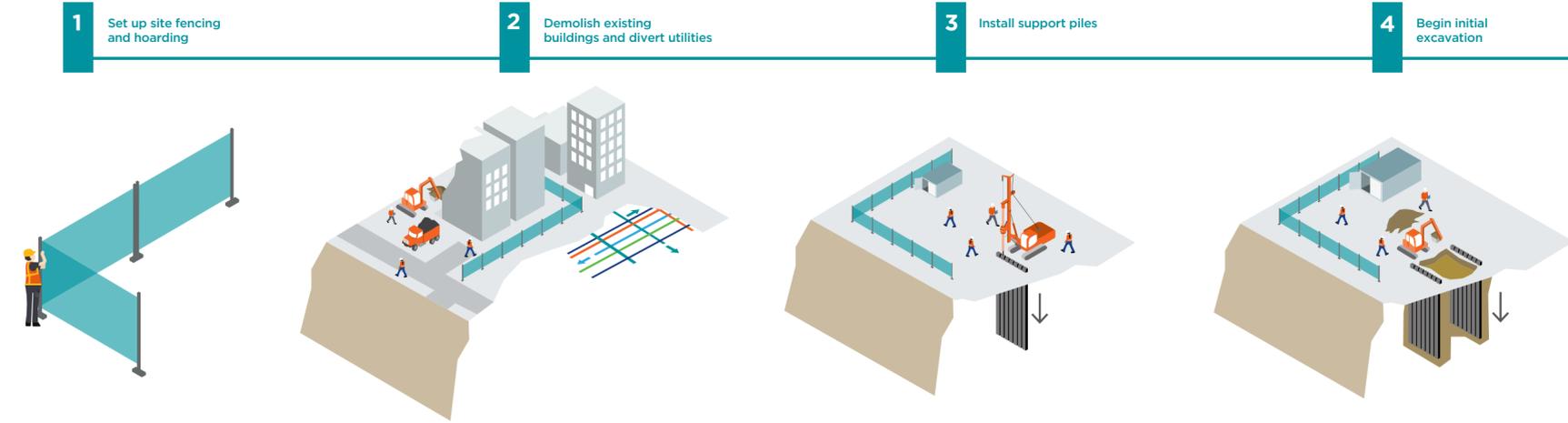
Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North and The Bays would be **cut-and-cover** stations.

Five Dock would be a **binocular** station.

Once excavation is complete, Westmead and The Bays station sites would become **tunnelling** sites.

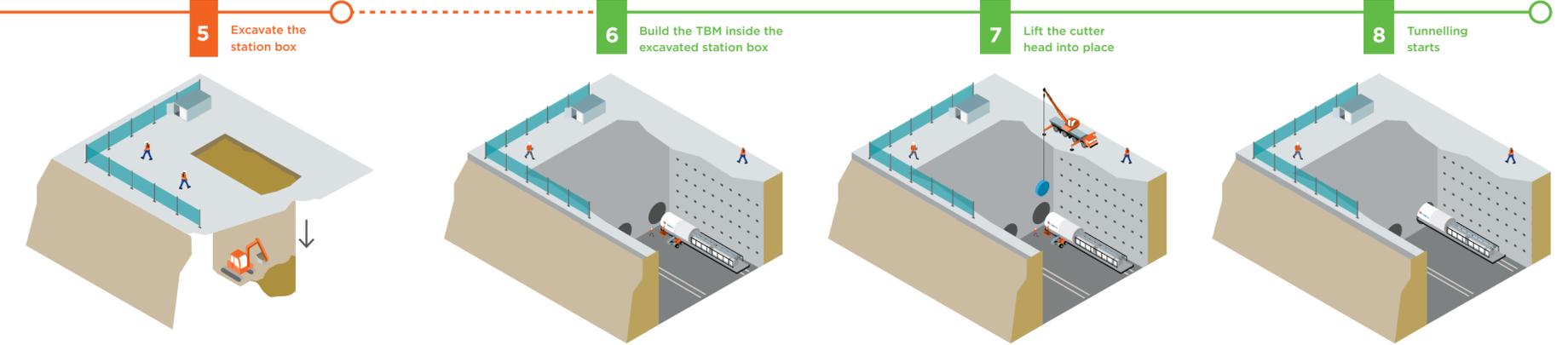
Each TBM would be lowered piece by piece into the excavated station boxes and then assembled. The TBMs would then slowly make their way underground to Sydney Olympic Park, excavating the tunnels as they go. They would then be dismantled piece by piece and lifted out.

Building the stations – Site preparation for all stations



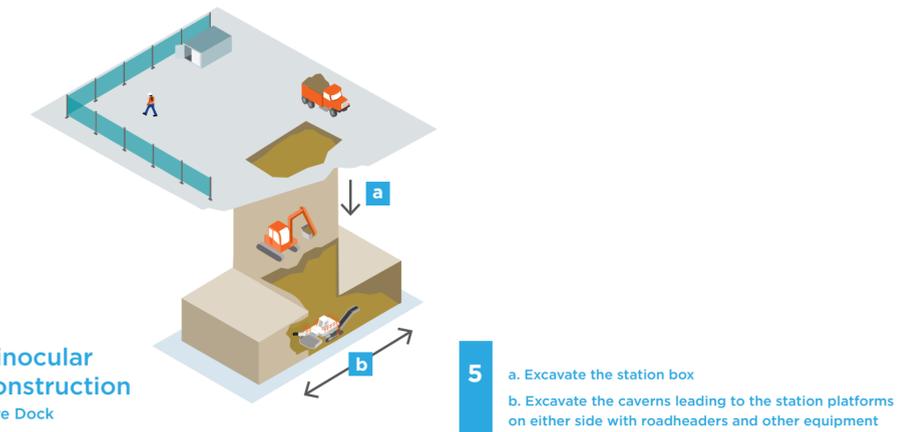
Cut-and-cover construction

Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, The Bays

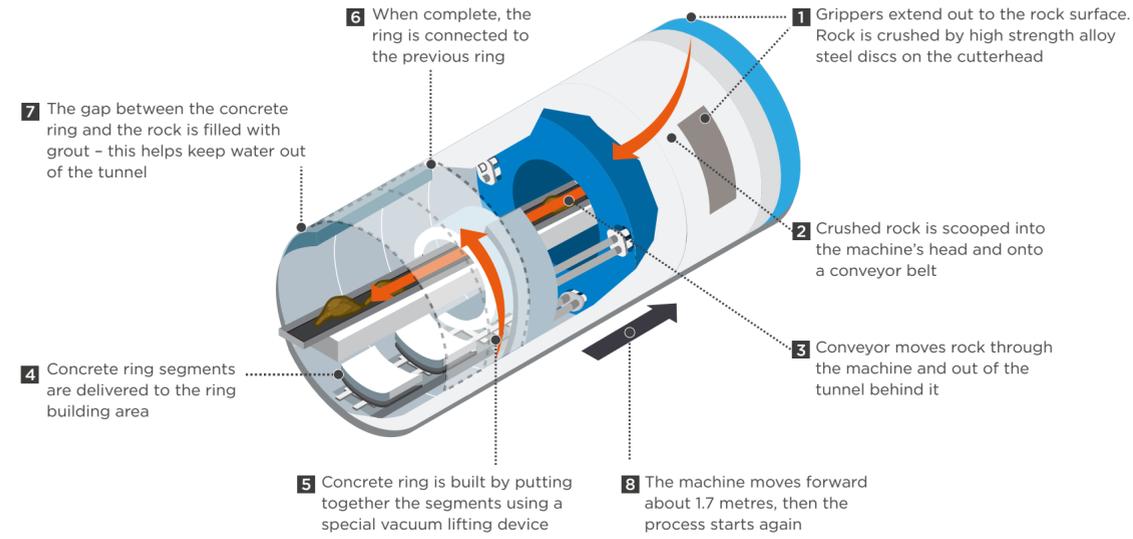


Binocular construction

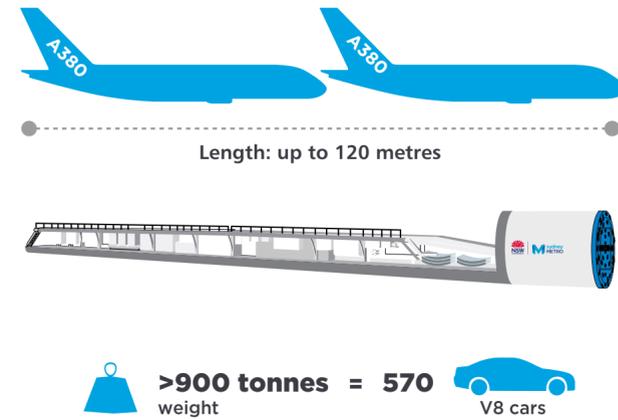
Five Dock



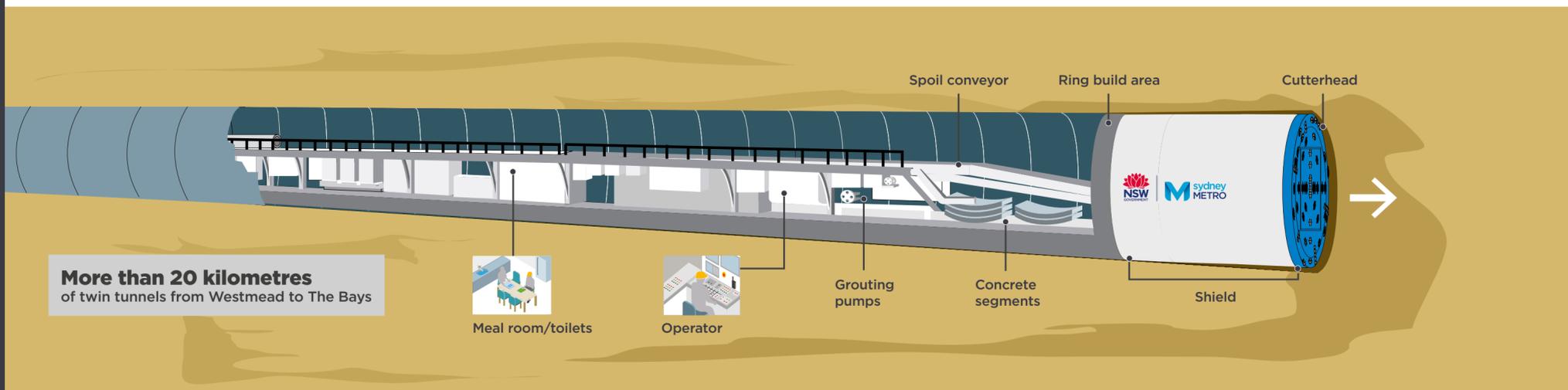
How a tunnel boring machine works



How does a TBM measure up?



Right: TBM Wendy breaking through at Blues Point on the Sydney Metro City & Southwest project.



Surface level

27 metres (approximately 9 storeys) Average tunnel depth, North West

35 metres (approximately 12 storeys) Average tunnel depth, City & Southwest

38 metres (approximately 13 storeys) Average tunnel depth, West



Powering the tunnel boring machines

TBMs and roadheaders used to construct tunnels, passages and caverns between Westmead and The Bays would require dedicated power sources. This means new cables would need to be installed between some metro sites and nearby substations or existing power sources.

Power supply routes would generally be located within existing road reserves and under-boring may be used to minimise impacts on major roads or infrastructure.

The cables would be laid underground and construction would generally include:

- investigating sites to locate existing services and assess ground conditions
- digging trenches and installing conduits (plastic pipes) to hold the new cables
- filling trenches and resurfacing the areas in consultation with the local council
- installing one small electricity kiosk within each metro site.



The cutterhead of TBM Kathleen used on the City & Southwest metro project.

Indicative power supply routes

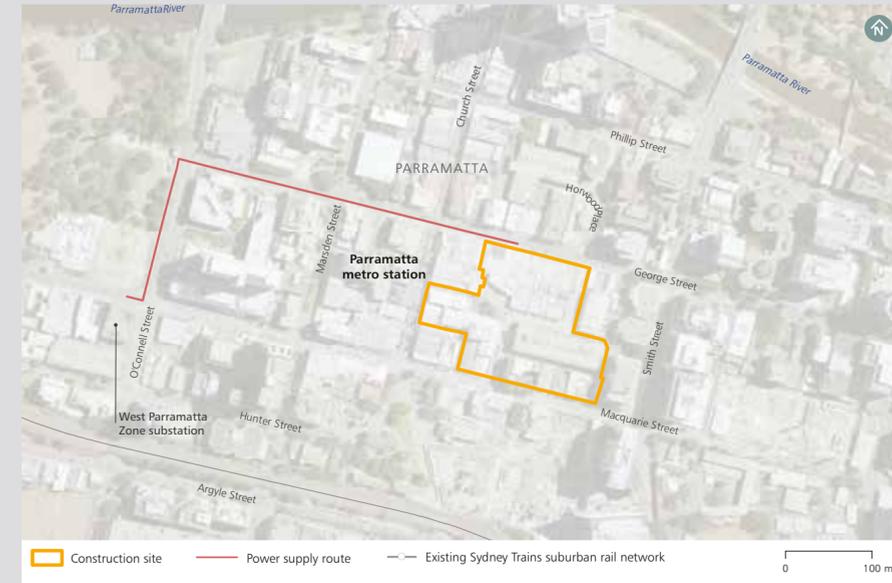
These maps show proposed cable routes at Westmead, Parramatta, Clyde and The Bays.

Residents and businesses located along the proposed cable routes would be notified of the timing and duration of these works.

Westmead



Parramatta



Clyde



The Bays



Tunnelling

The TBMs would work underground 24 hours a day, seven days a week.

Residents and businesses along the alignment may be aware of the TBMs for a few days as they pass by underground. How noticeable the TBMs are would vary depending on ground conditions, how deep the tunnel is and the types of buildings above.

Movement of the TBM could be more noticeable at night when other noise and movement levels are lower.

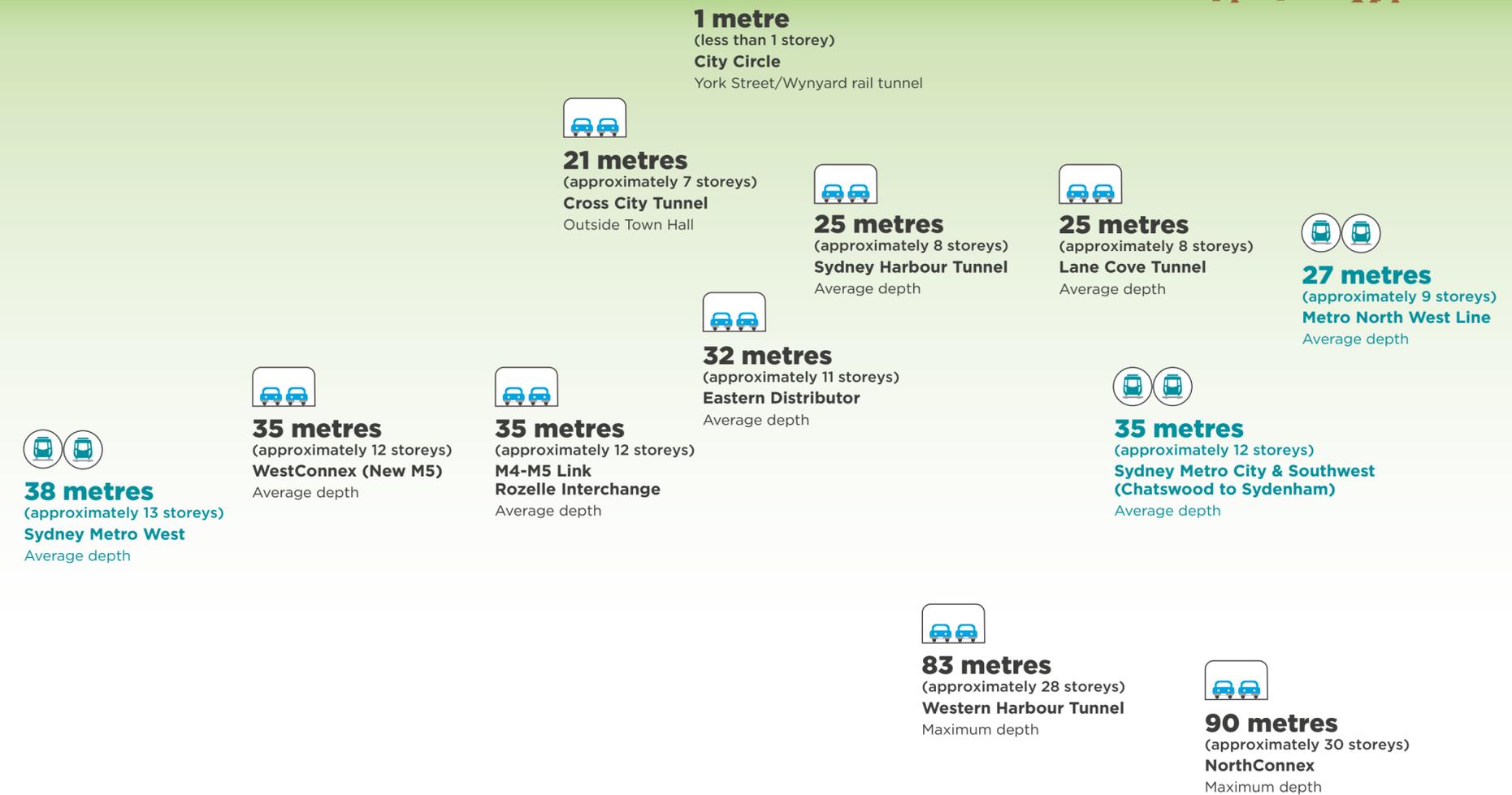
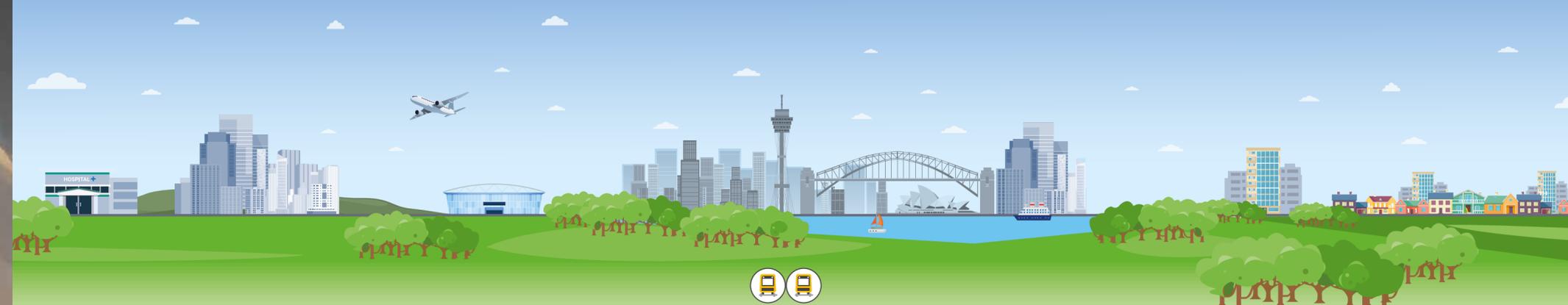
Property condition surveys would also be offered to properties neighbouring construction sites or above the tunnel alignment to identify any pre-existing conditions prior to construction or tunnelling works.

Crossing between tunnels

Crossover caverns would also be required to allow trains to pass from one track to another. Crossover caverns are important for the safety and reliability of the metro line, enabling trains to move from one tunnel to another in the case of a disruption, ensuring trains can keep moving. The appropriate locations for crossover caverns are currently being investigated.

Roadheaders and rock hammers

Roadheaders and/or rock hammers would also be used underground to dig crossover caverns and passages between the tunnels. This work is for short sections only and is planned to be undertaken 24 hours a day, seven days a week. Works requiring the use of rock hammers would be planned to occur during the day and as early as possible in the evening to minimise impacts on the local community.



Scan to view
Sydney Metro historic harbour crossing

TBM Nancy on the Sydney Metro City & Southwest project.

Indicative only, not to scale

Tunnel boring machine launch sites

TBM launch sites are located at both Westmead and The Bays, and would provide support for tunnelling operations including:

- spoil storage and removal – for materials removed from the tunnels, like crushed rock
- power supply – installed via underground cable connections
- ventilation – allowing fresh air flow into and out of the metro train tunnels
- grout batching – to mix grout that can then be used on the inside of the tunnels
- water treatment – to treat water from the tunnels that can then largely be reused on site
- materials storage – for construction materials required for tunnelling
- office facilities, amenities and construction worker parking – for the tunnel construction team.

A TBM being assembled on the Sydney Metro City & Southwest project.



Inside the tunnels

Lining the tunnels

Pre-cast concrete segments to line the metro tunnels would be manufactured specifically for the project. A concrete batch plant and pre-cast facility are planned to be located within the Clyde stabling and maintenance facility. Concrete segments would be made on site and then be transported to each of the tunnelling launch sites and stored until required.



Per day the project could make about **130 tunnel lining rings** requiring about



3700 tonnes

of sand, aggregate, cement, polypropylene and steel reinforcement

Safety inside the tunnels

All tunnels would be built with evacuation walkways to facilitate safe evacuation from the train in an emergency. Cross passages would also be built at regular intervals to allow customers to move from one tunnel to another in the event of an incident.

Tracks

Continuously welded rail tracks would sit inside the tunnels on top of a fixed concrete slab to provide a smooth surface for the metro trains, minimising noise inside the tunnels.



Scan to view
How we tunnelled under central Sydney as part of the Sydney Metro City & Southwest project

Pre-cast concrete segments prepared for the Sydney Metro City & Southwest project.



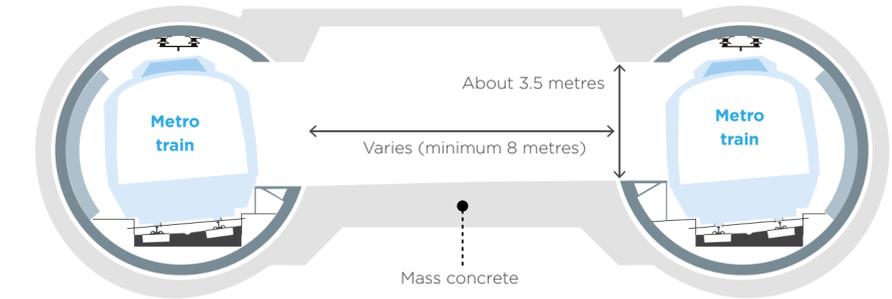


Tunnel equipment and services

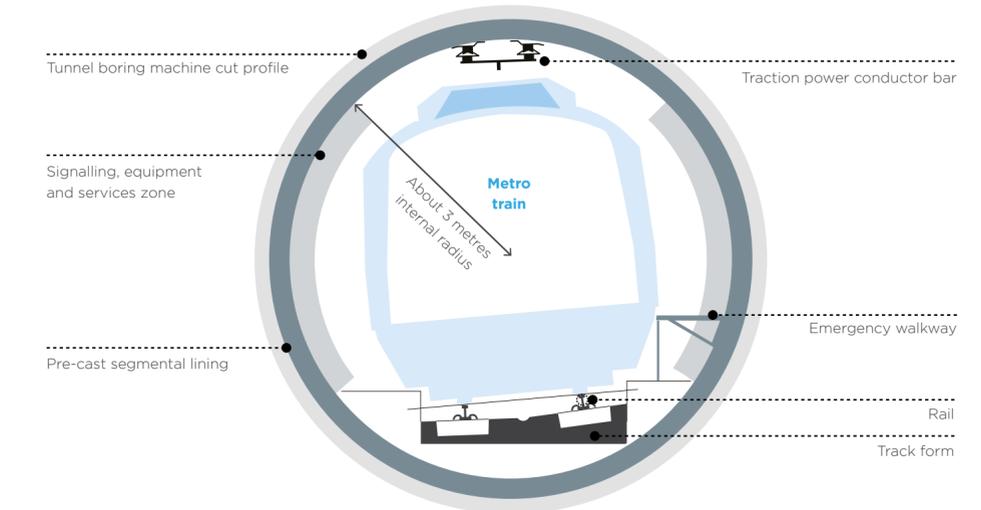
The tunnels would be fitted with rail signalling, controls and communication, overhead traction power, fresh air ventilation, fire and life safety systems, and lighting. Drainage would be incorporated into the concrete slab under the railway tracks and wastewater from the tunnels, stations and other underground facilities is planned to be pumped to a water treatment plant at Clyde.

The installation of tracks and tunnel equipment and services would be completed after the tunnelling work and would be subject to a separate environmental planning assessment.

Indicative cross-section of metro twin tunnels



Indicative cross-section of a tunnel cross passage



Inside a metro tunnel on the Sydney Metro City & Southwest project.



Stations and sites

Artist's impression of North Strathfield metro station.

Project staging and indicative timeframes

The environmental assessment process for Sydney Metro West will be staged in recognition of the size of the project. This includes:

The Concept application (this approval) seeks approval for construction and operation of a Sydney Metro line from Westmead to the Sydney CBD. Specific construction works as they relate to the Concept would be assessed as part of separate planning approvals.

The Stage 1 application (this approval) seeks approval for all major civil construction works between Westmead and The Bays, including station excavation and tunnelling.

The Stage 2 application (future approval) is expected to seek approval for all stations, depots and rail systems between Westmead and The Bays.

The Stage 3 application (future approval) is expected to seek approval for all major civil construction works including station excavation, tunnels, stations, depots and rail systems between The Bays and the Sydney CBD Station.

Stage 1 works would take around five years to complete. This timeframe does not include works that are planned to be assessed as part of the Stage 2 and Stage 3 applications.

Environmental assessment staging



*Works at The Bays are planned to commence in 2020 subject to a separate environmental planning process.



Artist's impression of Westmead metro station.

Westmead metro station and tunnel boring machine launch site

The proposed Westmead metro station would be located on the eastern side of Hawkesbury Road, south of the existing Westmead Station. The station would have one entrance on Hawkesbury Road.

New metro platforms would be located next to the existing Westmead Station, providing an easy above-ground interchange with the T1 Western Line and

T5 Cumberland Line. The new station would also provide customers with easy access to Parramatta Light Rail, T-way buses and other bus services.

As well as connecting customers to the Westmead health, education, and employment hub, the new metro station would service residential areas experiencing growth and renewal in both north and south Westmead.

Indicative construction timeframe for Stage 1 works



*Indicative construction timeframes for Stage 2 works would be subject to further design development and the environmental assessment process.

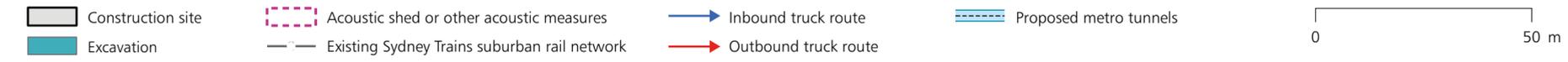
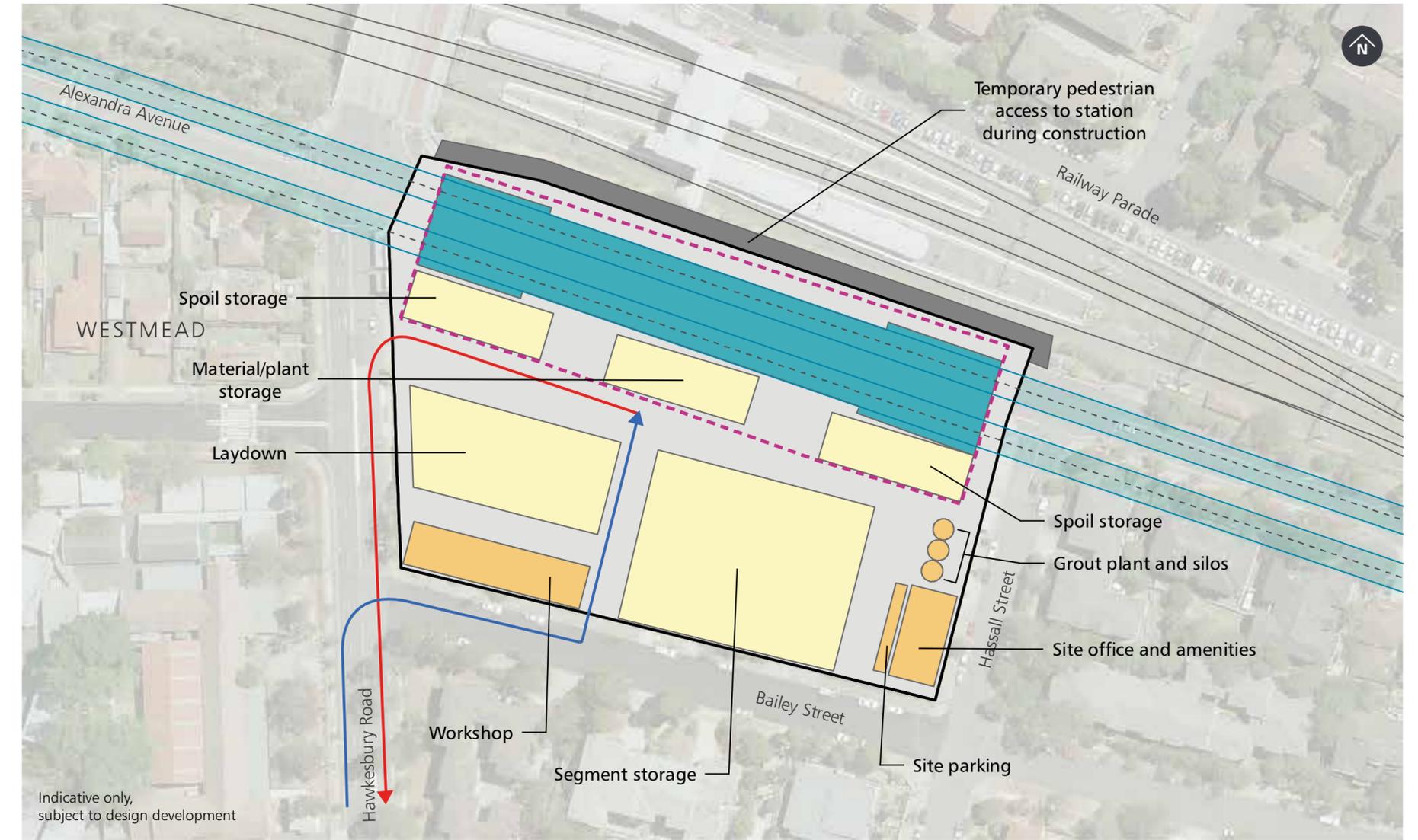
Construction at a glance

Feature	Description
Size	15,750 square metres (m ²)
Site access	Bailey Street: via Hawkesbury Road: left-in Hawkesbury Road: left-out
Proposed construction hours	Site establishment: Monday to Friday 7am–6pm and Saturday 8am–1pm, occasionally work may be required outside of standard construction hours Demolition: Monday to Friday 7am–6pm and Saturday 8am–1pm Excavation and tunnelling: 24 hours a day Spoil removal: 24 hours a day The community would be provided with advanced notice of planned construction hours and work
Proposed truck movements	Site establishment and demolition: 296 trucks per day and 98 light vehicles per day Excavation: 612 trucks per day and 424 light vehicles per day Tunnelling: 990 trucks per day and 424 light vehicles per day Haulage routes would minimise the use of local and residential streets where possible
Proposed demolition	18 buildings
Indicative heritage impacts	No identified direct impacts Aboriginal and non-Aboriginal archaeological remains are not expected in this location
Proposed landscape changes	Trees and vegetation would be removed within the identified construction site Opportunities for the retention and protection of existing street trees and trees within the construction site would be identified prior to construction, along with opportunities to replace trees in the nearby communities in consultation with the local council
Proposed excavation	Cut-and-cover (station) and mined (turnback cavern)
Indicative spoil removal	Excavation: 245,000 cubic metres (m ³) Tunnelling: 675,000 cubic metres (m ³)
Proposed staff facilities	Offices, lunch rooms and amenities

Feature	Description																												
Proposed activities	Site establishment and demolition: installing hoarding, demolishing buildings, protecting and/or relocating utilities, transport network modifications, conducting investigations, installing staff facilities and services to the construction site, installing piles and initial excavation Excavating the station box: to a depth of 30 metres (approximately 10 storeys) Excavating a turnback cavern and stub tunnels: using a roadheader and/or rock hammers Launching two tunnel boring machines: from the excavated station box Providing tunnelling support: spoil storage, ventilation, grout batching and water treatment Removing spoil: via trucks																												
Proposed staff parking	A small number of parking spaces for staff on site Contractors may consider public transport or 'park and shuttle' services to transfer workers to this site																												
Indicative utility and power supply	New water, sewer and telecommunications connections to the construction site Power would be supplied from Endeavour Energy's West Parramatta Zone substation																												
Proposed traffic changes	Temporary changes: Bailey Street – detour between Hawkesbury Road and Hassall Street around the closed section of Alexandra Avenue (see permanent changes to Alexandra Avenue below) Hawkesbury Road/Alexandra Avenue – modification of traffic signals Alexandra Avenue/Hassall Street – modification of traffic signals Hawkesbury Road/Bailey Street – new traffic signals Permanent changes: Alexandra Avenue – closure and realignment between Hassall Street and Hawkesbury Road (at the start of construction) Hawkesbury Road, Grand Avenue and the realigned Alexandra Avenue – new signalised intersection (at the completion of tunnelling and excavation works) Hawkesbury Road/Alexandra Avenue – modification of traffic signals (at the completion of tunnelling and excavation works) Alexandra Avenue/Hassall Street – modification of traffic signals (at the completion of tunnelling and excavation works)																												
Indicative utility works	Relocation and/or protection of existing power, communications, water, sewer and stormwater systems																												
Indicative plant and equipment	<table border="1"> <tbody> <tr> <td>Excavator</td> <td>Bulldozer</td> <td>Portal crane</td> <td>Water treatment</td> </tr> <tr> <td>Jackhammer</td> <td>Dust scrubber</td> <td>Rock breaker</td> <td>Mobile elevated platforms</td> </tr> <tr> <td>Compressor</td> <td>Ventilation fan</td> <td>Roadheader</td> <td>Sub-surface concrete truck</td> </tr> <tr> <td>Piling rig</td> <td>Front end loader</td> <td>Jumbo drill rig</td> <td>Articulated dump truck</td> </tr> <tr> <td>Pumps</td> <td>Shotcrete robot</td> <td>Crawler crane</td> <td>Concrete boom pump</td> </tr> <tr> <td>Conveyors</td> <td>Diesel generator</td> <td>Air track drill</td> <td>Tunnel boring machines</td> </tr> <tr> <td>Mobile crane</td> <td>Concrete cutter</td> <td>Concrete pump</td> <td></td> </tr> </tbody> </table>	Excavator	Bulldozer	Portal crane	Water treatment	Jackhammer	Dust scrubber	Rock breaker	Mobile elevated platforms	Compressor	Ventilation fan	Roadheader	Sub-surface concrete truck	Piling rig	Front end loader	Jumbo drill rig	Articulated dump truck	Pumps	Shotcrete robot	Crawler crane	Concrete boom pump	Conveyors	Diesel generator	Air track drill	Tunnel boring machines	Mobile crane	Concrete cutter	Concrete pump	
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Conveyors	Diesel generator	Air track drill	Tunnel boring machines																										
Mobile crane	Concrete cutter	Concrete pump																											
Proposed public transport changes	Bus services – relocation of two bus stops on Alexandra Avenue between Hawkesbury Road and Hassall Street																												
Proposed street parking changes	Hassall and Bailey streets – about 35 parking spaces adjacent to the construction site would need to be temporarily removed to allow trucks to enter and exit the construction site safely																												
Proposed noise management	Sydney Metro branded hoarding would be erected around the perimeter of the construction site An acoustic shed and/or other acoustic measures would be in place																												
Indicative pedestrian and cyclist changes	Alexandra Avenue , between Hassall Street and Hawkesbury Road – construction of a temporary pedestrian footpath Alexandra Avenue – temporary relocation of bicycle racks and lockers on the northern side to a suitable location within the station precinct																												
Other projects and plans in the local area	Parramatta Light Rail – Stage 1 Westmead Innovation District Multiple residential and commercial developments																												



Construction site map



Parramatta metro station

The proposed Parramatta metro station would be on the block bounded by George, Macquarie, Church and Smith streets with an entrance on Horwood Place.

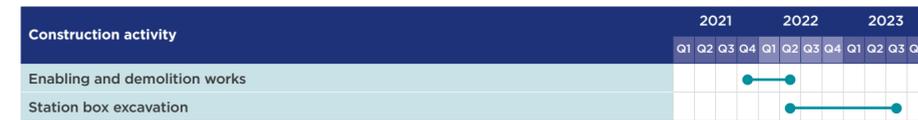
Strategically located to the north of the existing Parramatta Station, the new metro would be within the commercial core of the Parramatta CBD, taking pressure off the existing station and giving customers a second rail option.

Parramatta metro station would support Parramatta CBD as a major employment growth centre, boosting jobs and improving connections

across Greater Sydney. It would provide easy, efficient and accessible interchange with buses and Parramatta Light Rail.

The new metro station would integrate with the proposed Civic Link - a green, pedestrianised public space stretching from Parramatta Square in the south to Parramatta River in the north.

Indicative construction timeframe for Stage 1 works*



*Indicative construction timeframes for Stage 2 works would be subject to further design development and the environmental assessment process.

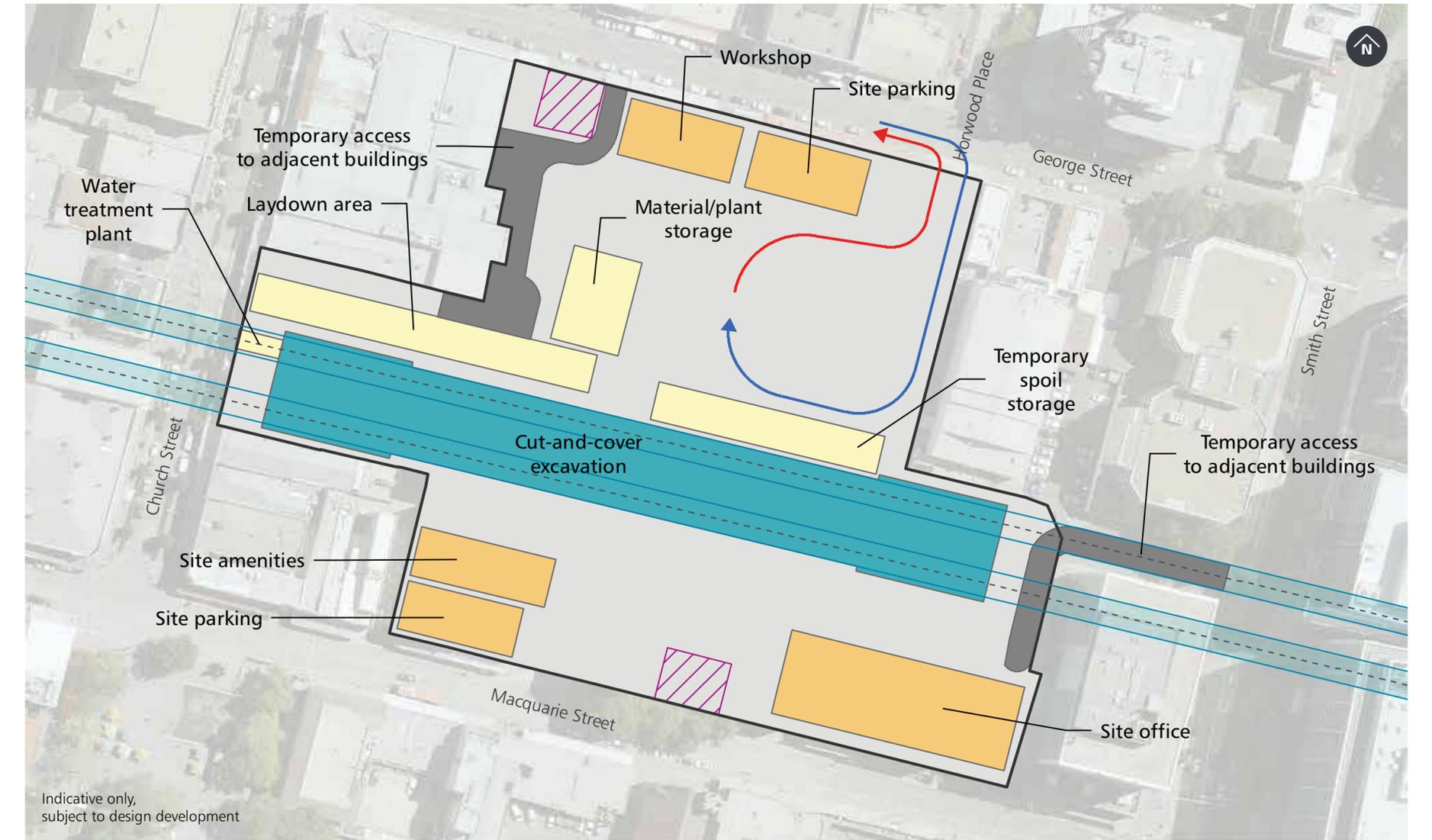
Construction at a glance

Feature	Description
Size	24,150 square metres (m ²)
Site access	George Street: right-in and left-out
Proposed construction hours	Site establishment: Monday to Friday 7am-6pm and Saturday 8am-1pm, occasionally work may be required outside of standard construction hours Demolition: Monday to Friday 7am-6pm and Saturday 8am-1pm Excavation: Monday to Friday 7am-6pm and Saturday 8am-1pm Spoil removal: 24 hours a day The community would be provided with advanced notice of planned construction hours and work
Proposed truck movements	Site establishment and demolition: 172 trucks per day and 68 light vehicles per day Excavation: 306 trucks per day and 236 light vehicles per day Haulage routes would minimise the use of local and residential streets where possible
Proposed demolition	16 buildings
Indicative heritage impacts	No identified direct impacts The heritage listed Kia Ora building and a heritage listed shop would be located within the construction site and would be protected during construction This site may contain potential Aboriginal and non-Aboriginal archaeological deposits. Investigation work would be carried out prior to construction work occurring and any remains found would be interpreted by the relevant specialists
Proposed landscape changes	Trees and other vegetation would be removed within the identified construction site Opportunities for the retention and protection of existing street trees and trees within the construction site would be identified prior to construction along with opportunities to replace trees in the nearby communities in consultation with the local council

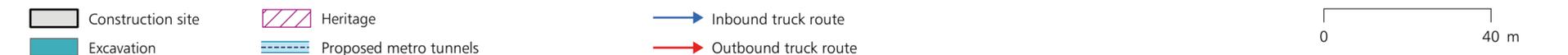
Feature	Description																								
Proposed excavation	Cut-and-cover																								
Indicative spoil removal	Excavation: 125,000 cubic metres (m ³)																								
Proposed activities	Site establishment and demolition - installing hoarding, demolishing buildings, protecting and/or relocating utilities, transport network modifications, conducting investigations, installing staff facilities and services to the construction site, installing piles and initial excavation Excavating the station box - to a depth of 28 metres (approximately 10 storeys) Removing spoil - via trucks																								
Proposed staff facilities	Offices, lunch rooms and amenities																								
Proposed staff parking	A small number of parking spaces for staff on site Contractors may consider public transport or 'park and shuttle' services to transfer workers to this site																								
Indicative utility and power supply	New water, sewer and telecommunications connections to the construction site Power would be supplied from Endeavour Energy's West Parramatta Zone substation																								
Proposed traffic changes	Horwood Place - closure and temporary detour via Smith and Church streets Church Street - construction of a temporary rear access lane to maintain access for properties fronting Church Street Permanent access arrangements around the station and future Civic Link would be subject to future station design and consultation with the local council																								
Indicative utility works	Relocation and/or protection of power, communications, communications towers, gas, stormwater, water and sewer systems																								
Indicative plant and equipment	<table border="1"> <tr> <td>Pumps</td> <td>Piling rig</td> <td>Dust scrubber</td> <td>Concrete cutter</td> </tr> <tr> <td>Excavator</td> <td>Bulldozer</td> <td>Ventilation fan</td> <td>Diesel generator</td> </tr> <tr> <td>Jackhammer</td> <td>Crawler crane</td> <td>Front end loader</td> <td>Concrete boom pump</td> </tr> <tr> <td>Conveyors</td> <td>Air track drill</td> <td>Water treatment</td> <td>Mobile elevated platforms</td> </tr> <tr> <td>Compressor</td> <td>Rock breaker</td> <td>Shotcrete robot</td> <td>Articulated dump truck</td> </tr> <tr> <td>Mobile crane</td> <td></td> <td></td> <td></td> </tr> </table>	Pumps	Piling rig	Dust scrubber	Concrete cutter	Excavator	Bulldozer	Ventilation fan	Diesel generator	Jackhammer	Crawler crane	Front end loader	Concrete boom pump	Conveyors	Air track drill	Water treatment	Mobile elevated platforms	Compressor	Rock breaker	Shotcrete robot	Articulated dump truck	Mobile crane			
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Conveyors	Air track drill	Water treatment	Mobile elevated platforms																						
Compressor	Rock breaker	Shotcrete robot	Articulated dump truck																						
Mobile crane																									
Proposed public transport changes	No changes																								
Proposed street parking changes	Horwood Place - removal of around 35 on-street parking spaces to facilitate construction of the new station																								
Proposed noise management	Sydney Metro branded hoarding would be erected around the perimeter of the construction site																								
Indicative pedestrian and cyclist changes	Horwood Place - temporary closure of pedestrian and cyclist routes for the duration of the construction work - alternative detour routes would be established via Church and Smith Streets Batman Walk - permanent closure of the walkway between Macquarie Street and Macquarie Lane Permanent pedestrian and cyclist access arrangements would be subject to future station design and consultation with the local council																								
Other projects and plans in the local area	Parramatta Light Rail - Stage 1 Planned Parramatta Light Rail - Stage 2 Proposed new Powerhouse Museum Westfield Shopping Centre Parramatta retail and commercial development City of Parramatta Civic Link Framework Plan Multiple residential and commercial developments Parramatta Square redevelopment																								



Construction site map



Indicative only, subject to design development

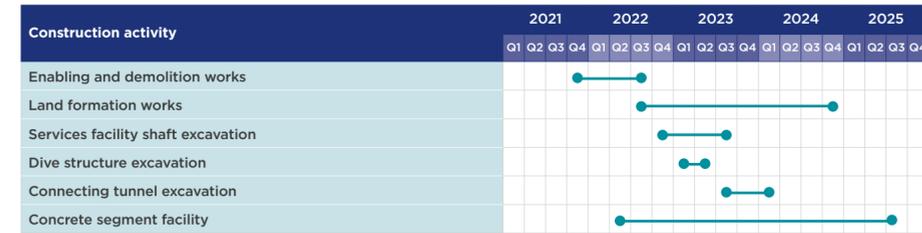


Clyde stabling and maintenance facility

A stabling and maintenance facility is proposed to be located in the Clyde and Rosehill industrial estate bounded by James Ruse Drive, the M4 Western Motorway, Unwin Street and Shirley Street.

Inside the facility a traction substation would provide power to the metro line, and a water treatment plant would treat and recycle all wastewater from the tunnels, stations and underground facilities. The facility would also include offices, parking and storage.

Indicative construction timeframe for Stage 1 works*



*Indicative construction timeframes for Stage 2 works would be subject to further design development and the environmental assessment process.

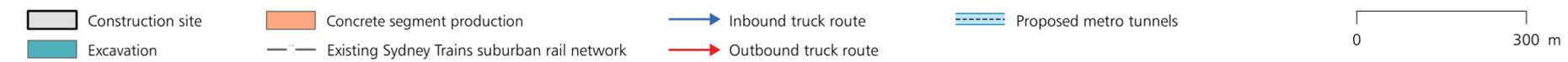
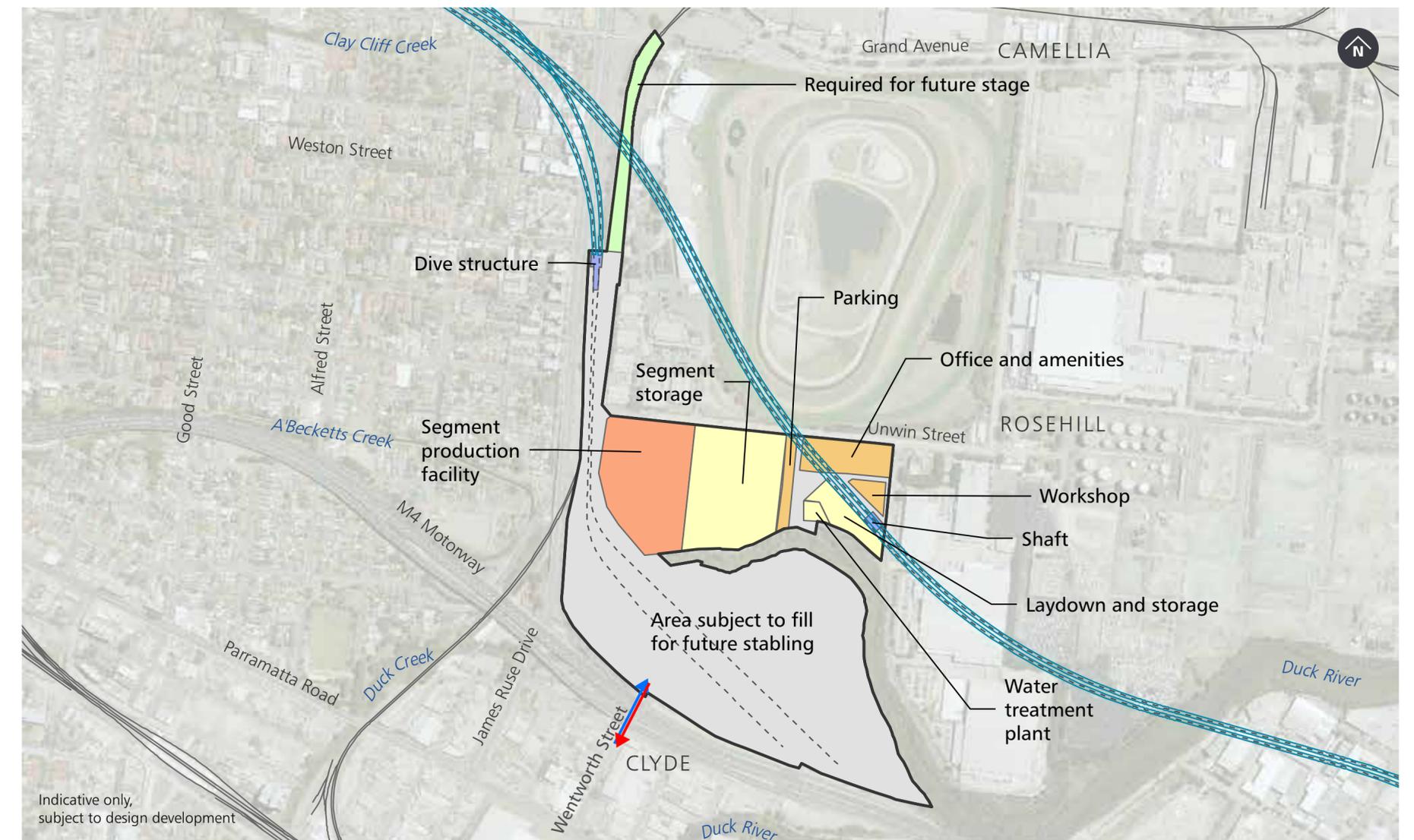
Construction at a glance

Feature	Description
Size	380,000 square metres (m ²)
Site access	Wentworth Street to Parramatta Road
Proposed construction hours	<p>Site establishment and demolition: Monday to Friday 7am–6pm and Saturday 8am–1pm, occasionally work may be required outside of standard construction hours</p> <p>Demolition: Monday to Friday 7am–6pm and Saturday 8am–1pm</p> <p>Excavation: Monday to Friday 7am–6pm and Saturday 8am–1pm</p> <p>Tunnelling: 24 hours a day</p> <p>Pre-cast facility operation: 24 hours a day</p> <p>Spoil delivery: 24 hours a day</p> <p>Spoil removal: 24 hours a day</p> <p>The community would be provided with advanced notice of planned construction hours and work</p>
Proposed truck movements	<p>Site establishment and demolition: 352 trucks per day and 310 light vehicles per day</p> <p>Excavation and importing spoil: 1056 trucks per day and 496 light vehicles per day</p> <p>Haulage routes would minimise the use of local and residential streets where possible</p>
Proposed demolition	50 buildings
Indicative heritage impacts	<p>The proposal would require the removal of approximately 0.7 hectares of heritage wetlands</p> <p>A heritage listed former Roads & Transport Authority (RTA) depot would be located within the construction site and would be protected during construction</p> <p>This site may contain potential Aboriginal archaeological deposits. Investigation work would be carried out prior to construction work and any remains found would be interpreted by the relevant specialists</p>
Proposed landscape changes	<p>Trees and mangroves (riparian vegetation) would be removed within the identified construction site</p> <p>Opportunities for the retention and protection of existing street trees within the construction site would be identified prior to construction along with opportunities to replace trees in the nearby communities in consultation with the local council</p>

Feature	Description																																				
Proposed excavation	Shaft excavation (services facility) and dive structure excavation																																				
Indicative spoil removal	<p>Services facility shaft: 20,000 cubic metres (m³)</p> <p>Dive structure: 90,000 cubic metres (m³)</p> <p>Connecting tunnels: 85,000 cubic metres (m³)</p>																																				
Proposed activities	<p>Site establishment and demolition – installing hoarding, demolishing buildings, protecting and/or relocating utilities, transport network modifications, conducting investigations, installing staff facilities and services to the construction site, installing piles and initial excavation</p> <p>Land formation works – to prepare the site for the stabling and maintenance facility</p> <p>Building a bridge – over A'Becketts Creek and Duck Creek, including creek realignment works</p> <p>Building a pre-cast concrete segment facility – to make the concrete segments for the inside of the tunnels</p> <p>Excavating a shaft – for a services facility</p> <p>Excavating a dive structure and tunnel portal – to create a tunnel for metro trains to access the service facility from the Sydney Metro West line</p>																																				
Proposed staff facilities	Offices, lunch rooms and amenities																																				
Proposed staff parking	<p>A small number of parking spaces for staff on site</p> <p>Contractors may consider public transport or 'park and shuttle' services to transfer workers to this site</p>																																				
Indicative utility and power supply	<p>New water, sewer and telecommunications connections to the construction site</p> <p>Power would be supplied from Endeavour Energy's Rosehill Zone substation</p>																																				
Proposed traffic changes	Unwin Street – permanent realignment around the construction site, including the construction of a bridge over the future metro rail tracks to ensure the heavy vehicle route is maintained																																				
Indicative utility works	Protection and/or relocation of existing power, communications, gas, water, sewer and stormwater systems																																				
Indicative plant and equipment	<table border="1"> <tbody> <tr> <td>Pumps</td> <td>Shotcrete robot</td> <td>Concrete pump</td> <td>Concrete boom pump</td> </tr> <tr> <td>Scraper</td> <td>Dust scrubber</td> <td>Portal crane</td> <td>Mobile elevated platforms</td> </tr> <tr> <td>Grader</td> <td>Compactor</td> <td>Rock breaker</td> <td>Sub-surface concrete truck</td> </tr> <tr> <td>Excavator</td> <td>Jackhammer</td> <td>Vibratory roller</td> <td>Articulated dump truck</td> </tr> <tr> <td>Conveyors</td> <td>Compressor</td> <td>Steel drum roller</td> <td>Vibratory pile driver</td> </tr> <tr> <td>Bulldozer</td> <td>Piling rig</td> <td>Ballast tamper</td> <td>Crawler crane</td> </tr> <tr> <td>Roadheader</td> <td>Concrete cutter</td> <td>Water treatment</td> <td>Front-end loader</td> </tr> <tr> <td>Backhoe</td> <td>Diesel generator</td> <td>Front end loader</td> <td>Air track drill</td> </tr> <tr> <td>Ventilation fan</td> <td>Mobile crane</td> <td>Jumbo drill rig</td> <td></td> </tr> </tbody> </table>	Pumps	Shotcrete robot	Concrete pump	Concrete boom pump	Scraper	Dust scrubber	Portal crane	Mobile elevated platforms	Grader	Compactor	Rock breaker	Sub-surface concrete truck	Excavator	Jackhammer	Vibratory roller	Articulated dump truck	Conveyors	Compressor	Steel drum roller	Vibratory pile driver	Bulldozer	Piling rig	Ballast tamper	Crawler crane	Roadheader	Concrete cutter	Water treatment	Front-end loader	Backhoe	Diesel generator	Front end loader	Air track drill	Ventilation fan	Mobile crane	Jumbo drill rig	
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Ventilation fan	Mobile crane	Jumbo drill rig																																			
Proposed public transport changes	No changes																																				
Proposed street parking changes	Unwin and Wentworth streets – temporary removal of up to 10 on-street parking spaces to allow trucks to enter and exit the site safely																																				
Proposed noise management	Sydney Metro branded hoarding would be erected around the perimeter of the construction site																																				
Indicative pedestrian and cyclist changes	Unwin Street – permanent closure of footpaths on the southern side of the road, pedestrians would be advised to use the northern side of the road																																				
Other projects and plans in the local area	<p>Parramatta Light Rail – Stage 1</p> <p>Clyde Terminal Conversion Project</p>																																				



Construction site map

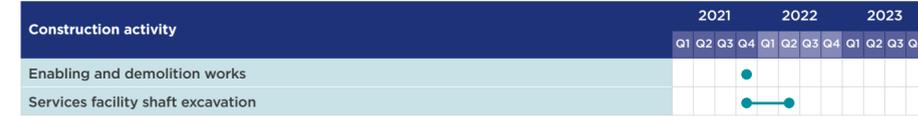


Silverwater services facility

A services facility is proposed to be built at Silverwater on the corner of Derby Street and Silverwater Road. The facility would provide fresh air ventilation into the tunnels and emergency exits out of them.

Further planning is underway to determine the location of another service facility between Five Dock and The Bays.

Indicative construction timeframe for Stage 1 works*



*Indicative construction timeframes for Stage 2 works would be subject to further design development and the environmental assessment process.

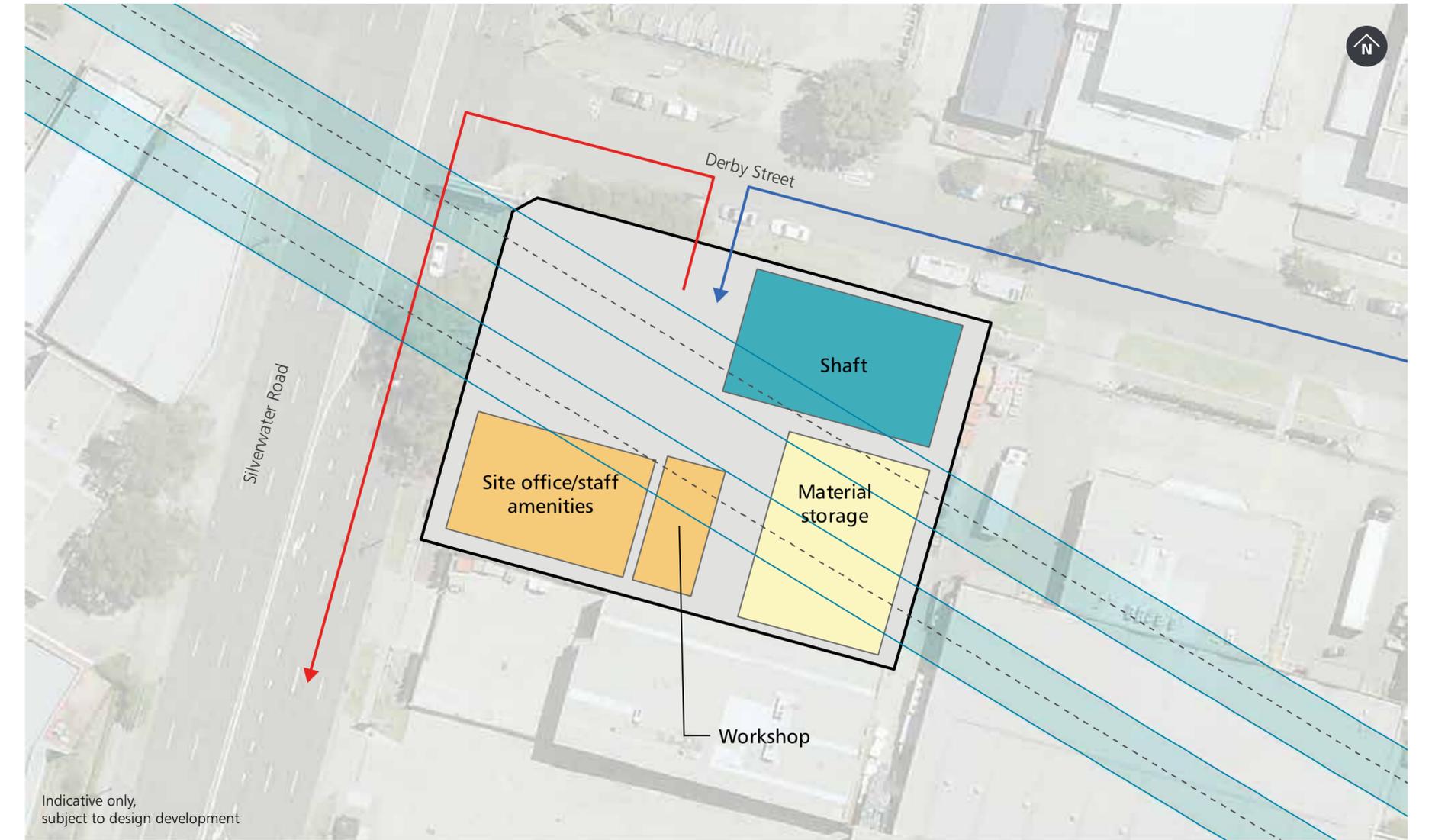
Construction at a glance

Feature	Description
Size	2700 square metres (m ²)
Site access	Derby Street: left-in and left-out
Proposed construction hours	Site establishment: Monday to Friday 7am-6pm and Saturday 8am-1pm, occasionally work may be required outside of standard construction hours Excavation: Monday to Friday 7am-6pm and Saturday 8am-1pm Spoil removal: 24 hours a day The community would be provided with advanced notice of planned construction hours and work
Proposed truck movements	Site establishment and demolition: 136 trucks per day and 38 light vehicles per day Excavation: 184 trucks per day and 92 light vehicles per day Haulage routes would minimise the use of local and residential streets where possible
Proposed demolition	No buildings require demolition
Indicative heritage impacts	No identified direct impacts Aboriginal and non-Aboriginal archaeological remains are not expected in this location
Proposed landscape changes	Street trees and other vegetation would be removed within the site Opportunities for the retention and protection of existing street trees and trees within the construction site would be identified prior to construction along with opportunities to replace trees in nearby communities in consultation with the local council
Proposed excavation	Shaft excavation
Indicative spoil removal	Services facility shaft: 20,000 cubic metres (m ³)
Proposed activities	Site establishment and demolition - installing hoarding, protecting and/or relocating utilities, transport network modifications, conducting investigations, installing staff facilities and services to the construction site, installing piles and initial excavation Excavating a shaft - for a services facility
Proposed staff facilities	Offices, lunch rooms and amenities
Proposed staff parking	A small number of parking spaces for staff on site Contractors may consider public transport or 'park and shuttle' services to transfer workers to this site

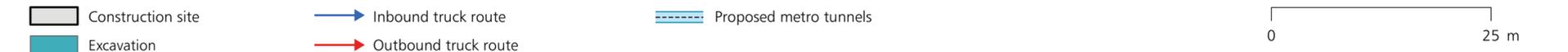
Feature	Description																											
Indicative utility and power supply	New water, sewer and telecommunications connections to the construction sites Power will be connected via existing underground Ausgrid cables located in Silverwater Road																											
Proposed traffic changes	No changes																											
Indicative utility works	Protection and/or relocation of existing power, communications, gas, water, sewer and stormwater systems																											
Indicative plant and equipment	<table border="1"> <tbody> <tr> <td>Pumps</td> <td>Concrete cutter</td> <td>Shotcrete robot</td> </tr> <tr> <td>Excavator</td> <td>Jumbo drill rig</td> <td>Dust scrubber</td> </tr> <tr> <td>Jackhammer</td> <td>Front end loader</td> <td>Ventilation fan</td> </tr> <tr> <td>Diesel generator</td> <td>Crawler crane</td> <td>Mobile elevated platforms</td> </tr> <tr> <td>Compressor</td> <td>Conveyors</td> <td>Sub-surface concrete truck</td> </tr> <tr> <td>Mobile crane</td> <td>Air track drill</td> <td>Articulated dump truck</td> </tr> <tr> <td>Piling rig</td> <td>Rock breaker</td> <td>Concrete boom pump</td> </tr> <tr> <td>Portal crane</td> <td>Water treatment</td> <td></td> </tr> <tr> <td>Bulldozer</td> <td>Concrete pump</td> <td></td> </tr> </tbody> </table>	Pumps	Concrete cutter	Shotcrete robot	Excavator	Jumbo drill rig	Dust scrubber	Jackhammer	Front end loader	Ventilation fan	Diesel generator	Crawler crane	Mobile elevated platforms	Compressor	Conveyors	Sub-surface concrete truck	Mobile crane	Air track drill	Articulated dump truck	Piling rig	Rock breaker	Concrete boom pump	Portal crane	Water treatment		Bulldozer	Concrete pump	
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Proposed public transport changes	No changes																											
Proposed street parking changes	Derby Street - temporary removal of around six on-street parking spaces near the construction site access to allow trucks to enter and exit the site safely																											
Proposed noise management	Sydney Metro branded hoarding would be erected around the perimeter of the construction site																											
Indicative pedestrian and cyclist changes	No changes																											
Other projects and plans in the local area	No major projects in the local area																											



Construction site map



Indicative only, subject to design development



Sydney Olympic Park metro station and tunnel boring machine retrieval site



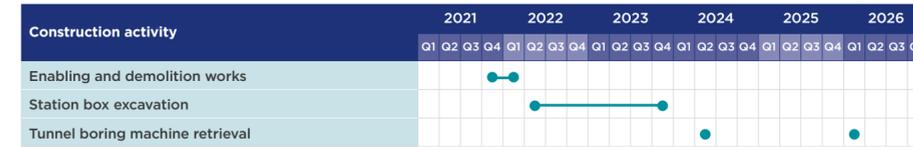
The proposed Sydney Olympic Park metro station would be located to the south of the existing Sydney Trains Olympic Park Station.

The station would provide for easy connections with the planned Parramatta Light Rail, the T7 Olympic Park Line and buses.

Located in the heart of the growing town centre, the station would sit to the east of Olympic Boulevard with the main station entrances between Herb Elliott Avenue and Figtree Drive, and off Dawn Fraser Avenue.

A metro station at Sydney Olympic Park would reinforce its status as Australia's premier events, sporting and entertainment precinct – supporting the transit of more than 10 million people who visit or stay each year.

Indicative construction timeframe for Stage 1 works*



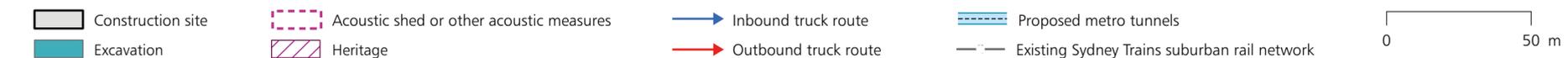
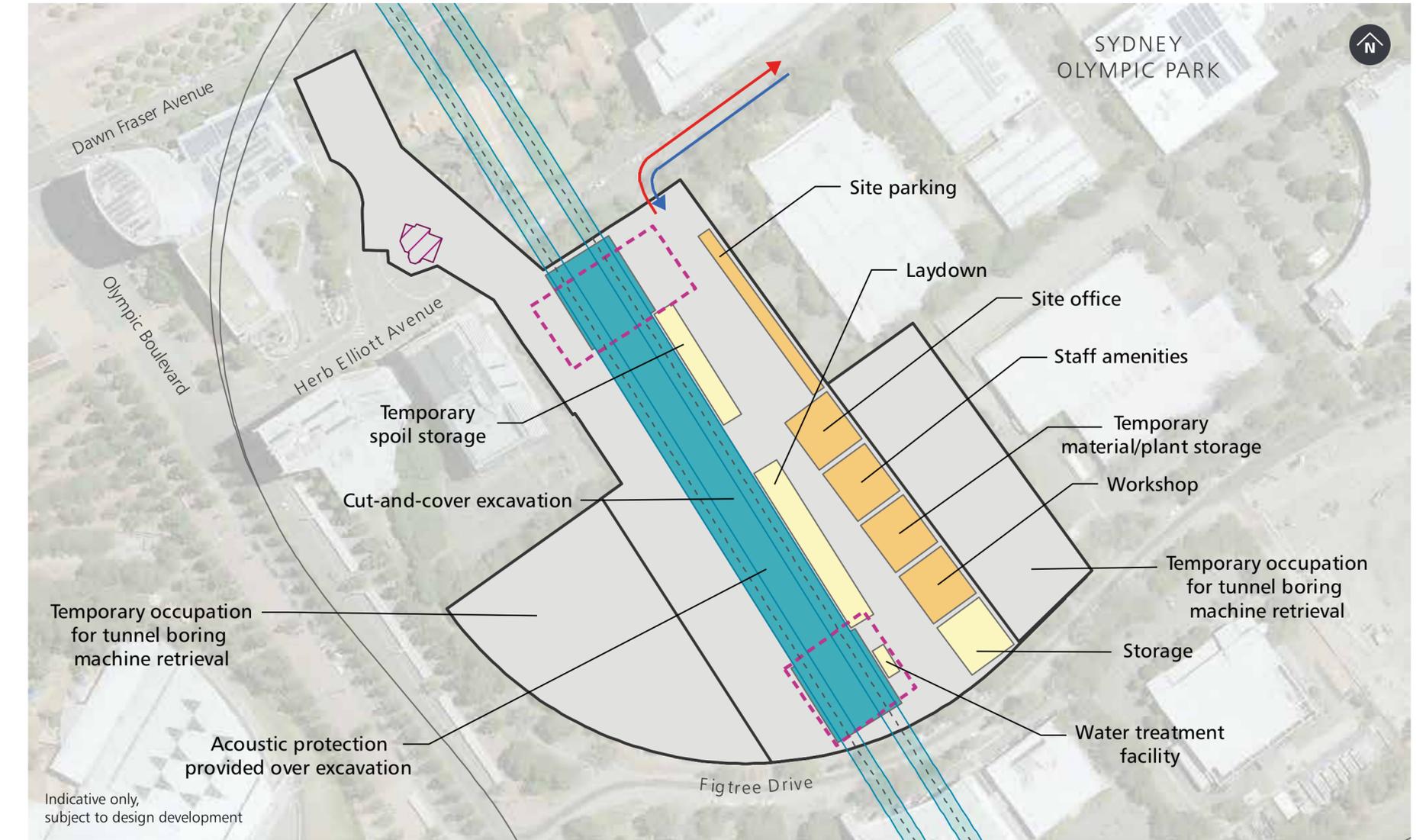
*Indicative construction timeframes for Stage 2 works would be subject to further design development and the environmental assessment process.

Construction at a glance

Feature	Description
Size	23,900 square metres (m ²)
Site access	Herb Eliot Avenue: left-in and right-out
Proposed construction hours	Site establishment and demolition: Monday to Friday 7am–6pm and Saturday 8am–1pm, occasionally work may be required outside of standard construction hours Demolition: Monday to Friday 7am–6pm and Saturday 8am–1pm Excavation: 24 hours a day Tunnel boring machine retrieval: 24 hours a day Spoil removal: 24 hours a day The community would be provided with advanced notice of planned construction hours and work
Proposed truck movements	Site establishment and demolition: 148 trucks per day and 78 light vehicles per day Excavation: 306 trucks per day and 252 light vehicles per day Haulage routes would minimise the use of local and residential streets where possible
Proposed demolition	Three buildings
Indicative heritage impacts	The proposal would require the removal and replacement of a portion of the heritage gardens outside of the State Abattoir. Archival reporting and recording would occur before construction and replanting would occur in the same location once construction is completed Throughout detailed design development, the project team would look for opportunities to minimise impacts to the gardens Aboriginal and non-Aboriginal archaeological remains are not expected in this location
Proposed landscape changes	Trees and other vegetation would be removed within the identified construction site Opportunities for the retention and protection of existing street trees and trees within construction sites would be identified prior to construction along with opportunities to replace trees in the nearby communities in consultation with the local council
Proposed excavation	Cut-and-cover

Feature	Description																											
Indicative spoil removal	Excavation: 225,000 cubic metres (m ³)																											
Proposed activities	Site establishment and demolition – installing hoarding, demolishing buildings, protecting and/or relocating utilities, transport network modifications, conducting investigations, installing staff facilities and services to the construction site, installing piles and initial excavation Excavating the station box – to a depth of 25 metres (approximately 8 storeys) Retrieving four tunnel boring machines from the excavated station box Removing spoil – via trucks																											
Proposed staff facilities	Offices, lunch rooms and amenities																											
Proposed staff parking	A small number of parking spaces for staff on site Contractors may consider public transport or 'park and shuttle' services to transfer workers to this site																											
Indicative utility and power supply	New water, sewer and telecommunications connections to the construction site Power would be supplied from existing Ausgrid cables located underground in Herb Elliott Avenue																											
Proposed traffic changes	Temporary changes: Herb Elliott Avenue – potential partial or full closure Permanent changes: Showground Road – closed to cars and open to pedestrians and cyclists at the intersection with Dawn Fraser Avenue These changes would not impact on access to operating businesses																											
Indicative utility works	Protection and/or relocation of existing power, communications, gas, water, sewer and stormwater systems																											
Indicative plant and equipment	<table border="1"> <tbody> <tr> <td>Excavator</td> <td>Front end loader</td> <td>Concrete pump</td> </tr> <tr> <td>Jackhammer</td> <td>Water treatment</td> <td>Portal crane</td> </tr> <tr> <td>Compressor</td> <td>Diesel generator</td> <td>Rock breaker</td> </tr> <tr> <td>Mobile crane</td> <td>Concrete cutter</td> <td>Tunnel boring machines (retrieval)</td> </tr> <tr> <td>Piling rig</td> <td>Air track drill</td> <td>Sub-surface concrete truck</td> </tr> <tr> <td>Pumps</td> <td>Shotcrete robot</td> <td>Mobile elevated platforms</td> </tr> <tr> <td>Conveyors</td> <td>Dust scrubber</td> <td>Articulated dump truck</td> </tr> <tr> <td>Bulldozer</td> <td>Ventilation fan</td> <td>Concrete boom pump</td> </tr> <tr> <td>Crawler crane</td> <td>Jumbo drill rig</td> <td></td> </tr> </tbody> </table>	Excavator	Front end loader	Concrete pump	Jackhammer	Water treatment	Portal crane	Compressor	Diesel generator	Rock breaker	Mobile crane	Concrete cutter	Tunnel boring machines (retrieval)	Piling rig	Air track drill	Sub-surface concrete truck	Pumps	Shotcrete robot	Mobile elevated platforms	Conveyors	Dust scrubber	Articulated dump truck	Bulldozer	Ventilation fan	Concrete boom pump	Crawler crane	Jumbo drill rig	
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Crawler crane	Jumbo drill rig																											
Proposed public transport changes	Herb Elliott Avenue – temporary relocation of the taxi rank to a suitable location within the precinct in consultation with stakeholders																											
Proposed street parking changes	No changes																											
Proposed noise management	Sydney Metro branded hoarding would be erected around the perimeter of the construction site An acoustic shed and/or other acoustic measures would be in place																											
Indicative pedestrian and cyclist changes	Showground Road – would become closed to cars and open to pedestrians and cyclists at the intersection with Dawn Fraser Avenue to facilitate access to the proposed northern station entry																											
Other projects and plans in the local area	Planned Parramatta Light Rail – Stage 2 Proposed Stadium Australia Redevelopment Sydney Olympic Park Masterplan 2030 Multiple residential and commercial developments																											

Construction site map



North Strathfield metro station

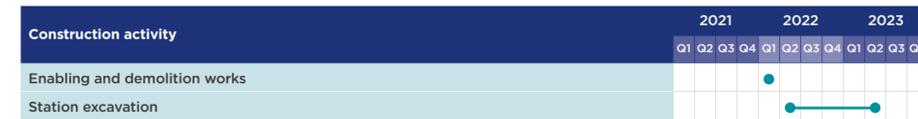
The proposed North Strathfield metro station would be adjacent to the existing Sydney Trains North Strathfield Station.

New metro platforms would sit alongside the existing station and entry to the station would be from a new entrance on Queen Street.

The station would improve connections to key employment and education precincts, taking the

pressure off Strathfield Station. It would provide for an easy interchange with the T9 Northern Line, opening up access to key centres in the North West like Norwest and Castle Hill via Epping. The metro station would help to service the growing Homebush precinct. It would also complement local placemaking strategies to revitalise public areas and retain and attract new businesses and residents, building on the vibrancy of this growing hub.

Indicative construction timeframe for Stage 1 works*



*Indicative construction timeframes for Stage 2 works would be subject to further design development and the environmental assessment process.

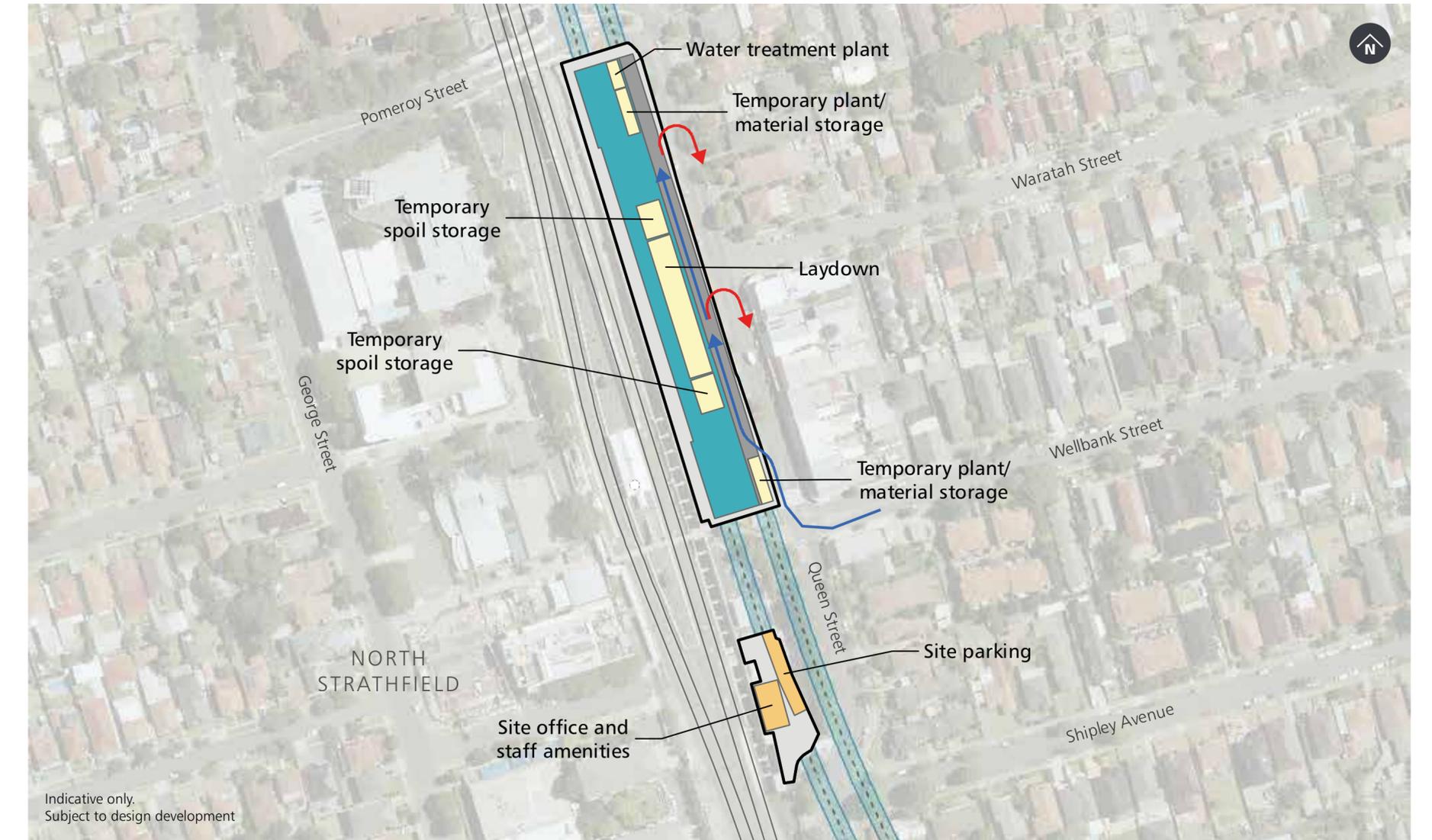
Construction at a glance

Feature	Description
Size	Northern site - 6500 square metres (m ²) Southern site - 1000 square metres (m ²)
Site access	Queen Street: left-in and right-out
Proposed construction hours	Site establishment: Monday to Friday 7am-6pm and Saturday 8am-1pm, occasionally work may be required outside of standard construction hours Demolition: Monday to Friday 7am-6pm and Saturday 8am-1pm Excavation: Monday to Friday 7am-6pm and Saturday 8am-1pm Spoil removal: Monday to Friday 7am-6pm and Saturday 8am-1pm The community would be provided with advanced notice of planned construction hours and work
Proposed truck movements	Site establishment and demolition: 66 trucks per day and 50 light vehicles per day Excavation: 136 trucks per day and 176 light vehicles per day Haulage routes would minimise the use of local and residential streets where possible
Proposed demolition	No buildings require demolition
Indicative heritage impacts	The proposal would require the removal and replanting and/or interpretation of the gardens outside North Strathfield Station on Queen Street. These gardens form part of the station heritage listing on the Sydney Trains heritage register Archival reporting and recording would occur before construction Aboriginal and non-Aboriginal archaeological remains are not expected in this location
Proposed landscape changes	Trees and other vegetation would be removed within the identified construction site Opportunities for the retention and protection of existing street trees and trees within the construction site would be identified prior to construction along with opportunities to replace trees in the nearby communities in consultation with the local council
Proposed excavation	Cut-and-cover
Indicative spoil removal	Excavation: 110,000 cubic metres (m ³)

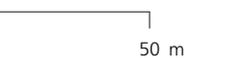
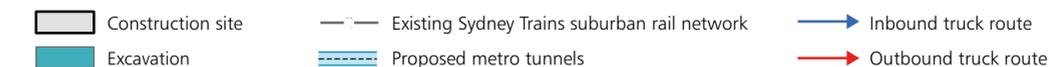
Feature	Description																					
Proposed activities	Site establishment and demolition - installing hoarding, protecting and/or relocating utilities, transport network modifications, conducting investigations, installing staff facilities and services to the construction site, installing piles and initial excavation Excavating the station box - to a depth of 18 metres (approximately 6 storeys) Removing spoil - via trucks																					
Proposed staff facilities	Offices, lunch rooms and amenities																					
Proposed staff parking	A small number of parking spaces for use by engineers and other management staff on site Contractors may consider 'park and shuttle' services to transfer workers to this site																					
Indicative utility and power supply	New water, sewer and telecommunications connections to the construction site Power would be supplied from existing Ausgrid cables located underground in Queen Street																					
Proposed traffic changes	No changes																					
Indicative utility works	Protection and/or relocation of existing power, communications, gas, water, sewer and stormwater systems																					
Indicative plant and equipment	<table border="1"> <tbody> <tr> <td>Pumps</td> <td>Water treatment</td> <td>Shotcrete robot</td> </tr> <tr> <td>Excavator</td> <td>Concrete cutter</td> <td>Ventilation fan</td> </tr> <tr> <td>Jackhammer</td> <td>Piling rig</td> <td>Diesel generator</td> </tr> <tr> <td>Bulldozer</td> <td>Crawler crane</td> <td>Mobile elevated platforms</td> </tr> <tr> <td>Conveyors</td> <td>Dust scrubber</td> <td>Articulated dump truck</td> </tr> <tr> <td>Compressor</td> <td>Rock breaker</td> <td>Concrete boom pump</td> </tr> <tr> <td>Mobile crane</td> <td>Air track drill</td> <td>Front end loader</td> </tr> </tbody> </table>	Pumps	Water treatment	Shotcrete robot	Excavator	Concrete cutter	Ventilation fan	Jackhammer	Piling rig	Diesel generator	Bulldozer	Crawler crane	Mobile elevated platforms	Conveyors	Dust scrubber	Articulated dump truck	Compressor	Rock breaker	Concrete boom pump	Mobile crane	Air track drill	Front end loader
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Conveyors	Dust scrubber	Articulated dump truck																				
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Mobile crane	Air track drill	Front end loader																				
Proposed public transport changes	Bus services - temporary relocation of the bus stop on the western side of Queen Street north of Wellbank Street The temporary locations of these bus stops would be determined in consultation with bus operators and road authorities North Strathfield Station - potential reconfiguration of access to North Strathfield Station from Queen Street. Lift access would be maintained at all times																					
Proposed street parking changes	Queen Street - temporary removal of around 20 on-street parking spaces and the kiss and ride bays on the western side of Queen Street between Wellbank Street and Pomeroy Street to allow trucks to safely enter and exit the construction site Temporary arrangements for the kiss and ride bays would be coordinated in consultation with road authorities																					
Proposed noise management	Sydney Metro branded hoarding would be erected around the perimeter of the construction site																					
Indicative pedestrian and cyclist changes	Queen Street - temporary closure of the footpath along the western side of Queen Street adjacent to the construction site between Wellbank Street and Pomeroy Street to allow trucks to safely enter and exit the construction site Queen Street - temporary relocation of pedestrian crossing across Queen Street from the north of Wellbank Street to the south of Wellbank Street to ensure pedestrians can continue to cross Queen Street safely during construction																					
Other projects and plans in the local area	No major projects in the area																					



Construction site map



Indicative only.
Subject to design development



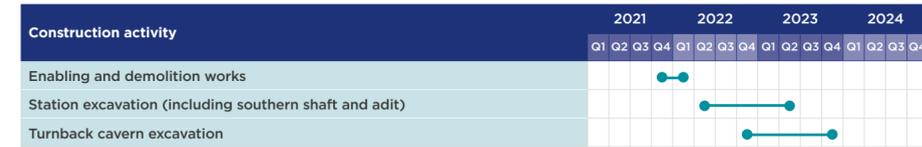
Burwood North Station

The proposed Burwood North Station would be located at the corner of Burwood and Parramatta roads, with entrances on both the north and south sides of Parramatta Road. A new metro station at Burwood North would take the pressure off the existing bus network along Parramatta and Burwood roads as well as Sydney Trains Burwood Station. Burwood North Station would strengthen the thriving business

and retail centre to the south of Parramatta Road, and provide a new, fast, frequent and reliable transport link for the community north of Parramatta Road.

The station would support the Parramatta Road Corridor Urban Transformation Strategy which includes streetscape upgrades and the creation of new and improved open spaces; urban plazas and town squares; and new walking and cycling links.

Indicative construction timeframe for Stage 1 works*



*Indicative construction timeframes for Stage 2 works would be subject to further design development and the environmental assessment process.

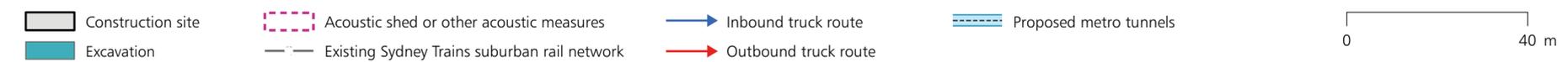
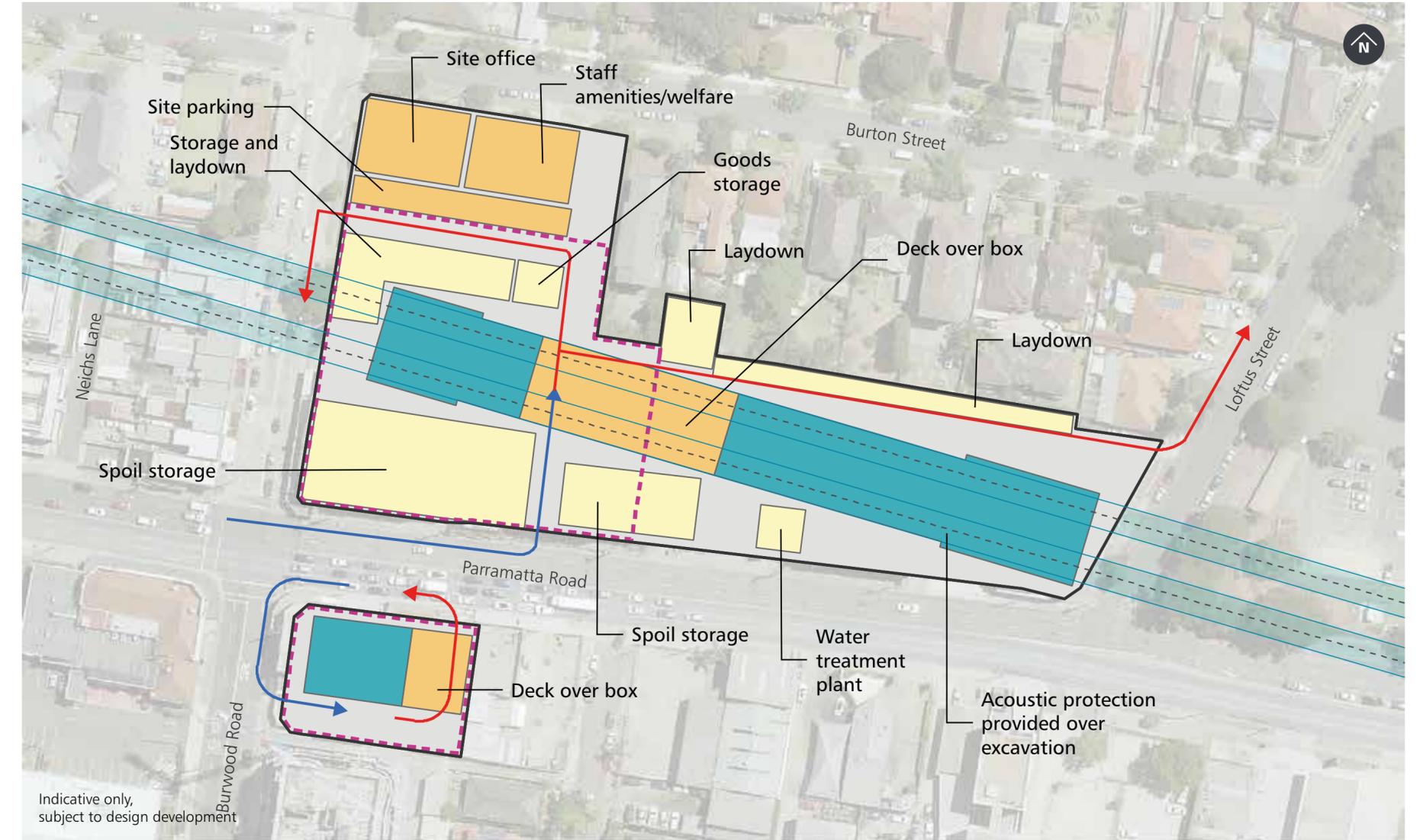
Construction at a glance

Feature	Description
Size	Northern site - 12,900 square metres (m ²) Southern site - 1400 square metres (m ²)
Site access	Northern site Parramatta Road: left-in Loftus Street and Burwood Road: left-out Southern site Burwood Road: left-in Parramatta Road: left-out
Proposed construction hours	Site establishment: Monday to Friday 7am-6pm and Saturday 8am-1pm, occasionally work may be required outside of standard construction hours Demolition: Monday to Friday 7am-6pm and Saturday 8am-1pm Excavation: 24 hours Spoil removal: 24 hours The community would be provided with advanced notice of planned construction hours and work
Proposed truck movements	Site establishment and demolition: 296 trucks per day and 98 light vehicles per day Excavation: 612 trucks per day and 424 light vehicles per day Haulage routes would minimise the use of local and residential streets where possible
Proposed demolition	16 buildings
Indicative heritage impacts	No identified direct impacts Aboriginal and non-Aboriginal archaeological remains are not expected in this location
Proposed landscape changes	Trees and other vegetation will be removed within the identified construction site Opportunities for the retention and protection of existing street trees and trees within the construction site would be identified prior to construction along with opportunities to replace trees in the nearby communities in consultation with the local council

Feature	Description																											
Proposed excavation	Cut-and-cover																											
Indicative spoil removal	Excavation: 235,000 cubic metres (m ³)																											
Proposed activities	Site establishment and demolition - installing hoarding, demolishing buildings, protecting and/or relocating utilities, transport network modifications, conducting investigations, installing staff facilities and services to the construction site, installing piles and initial excavation Excavating the station box - to a depth of 23 metres (approximately 8 storeys) Excavating a crossover cavern - using a roadheader and/or rock breaker Removing spoil - via trucks																											
Proposed staff facilities	Offices, lunch rooms and amenities																											
Proposed staff parking	A small number of parking spaces for use by on site Contractors may consider 'park and shuttle' services to transfer workers to this site																											
Indicative utility and power supply	New water, sewer and telecommunications connections to the construction site Power will be supplied from existing Ausgrid cables underground in Parramatta Road and Burton Street																											
Proposed traffic changes	No changes																											
Indicative utility works	Relocation and/or protection of existing power, communications, gas, water, sewer and stormwater systems																											
Indicative plant and equipment	<table border="0"> <tr> <td>Pumps</td> <td>Crawler crane</td> <td>Jumbo drill rig</td> </tr> <tr> <td>Excavator</td> <td>Dust scrubber</td> <td>Ventilation fan</td> </tr> <tr> <td>Bulldozer</td> <td>Water treatment</td> <td>Air track drill</td> </tr> <tr> <td>Conveyors</td> <td>Front end loader</td> <td>Shotcrete robot</td> </tr> <tr> <td>Roadheader</td> <td>Diesel generator</td> <td>Concrete boom pump</td> </tr> <tr> <td>Jackhammer</td> <td>Concrete cutter</td> <td>Sub-surface concrete truck</td> </tr> <tr> <td>Compressor</td> <td>Concrete pump</td> <td>Mobile elevated platform</td> </tr> <tr> <td>Mobile crane</td> <td>Portal crane</td> <td>Articulated dump truck</td> </tr> <tr> <td>Piling rig</td> <td>Rock breaker</td> <td></td> </tr> </table>	Pumps	Crawler crane	Jumbo drill rig	Excavator	Dust scrubber	Ventilation fan	Bulldozer	Water treatment	Air track drill	Conveyors	Front end loader	Shotcrete robot	Roadheader	Diesel generator	Concrete boom pump	Jackhammer	Concrete cutter	Sub-surface concrete truck	Compressor	Concrete pump	Mobile elevated platform	Mobile crane	Portal crane	Articulated dump truck	Piling rig	Rock breaker	
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Compressor	Concrete pump	Mobile elevated platform																										
Mobile crane	Portal crane	Articulated dump truck																										
Piling rig	Rock breaker																											
Proposed public transport changes	Bus services - temporary relocation of two bus stops, one along the northern and one on the southern side of Parramatta Road and the eastern side of Burwood Road (adjacent to the north site) The temporary locations of these bus stops would be determined in consultation with bus operators and road authorities																											
Proposed street parking changes	Loftus Street - temporary removal of around six on-street parking spaces to allow trucks to enter and exit the site safely																											
Proposed noise management	Sydney Metro branded hoarding will be erected around the perimeter of the construction site An acoustic shed and/or other acoustic measures will be in place																											
Indicative pedestrian and cyclist changes	No changes																											
Other projects and plans in the local area	Concord Oval redevelopment Parramatta Road Corridor Urban Transformation Strategy Multiple residential and commercial developments																											



Construction site map



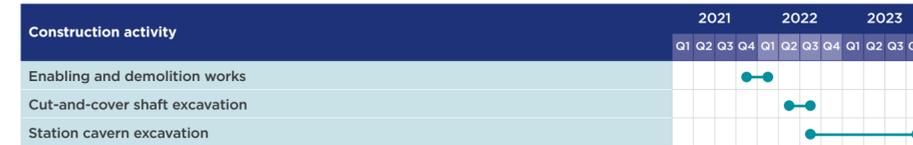
Five Dock Station

The proposed Five Dock Station would be made up of two sites – one located on Great North Road, between East Street (western site) and the other located at the corner of Second Avenue and Waterview Street (eastern site).

The station entrance would be located at Fred Kelly Place, off Great North Road. The project would deliver rail to this area for the first time, providing for a fast

and direct trip into the Sydney CBD. The new metro station would also provide for an easy interchange with the local bus network along Great North Road. The metro station would be integrated into the area and support recommendations of the local council's 'Five Dock Town Centre Urban Design Study', building on Five Dock as a vibrant and friendly village to live, work and visit.

Indicative construction timeframe for Stage 1 works*



*Indicative construction timeframes for Stage 2 works would be subject to further design development and the environmental assessment process.

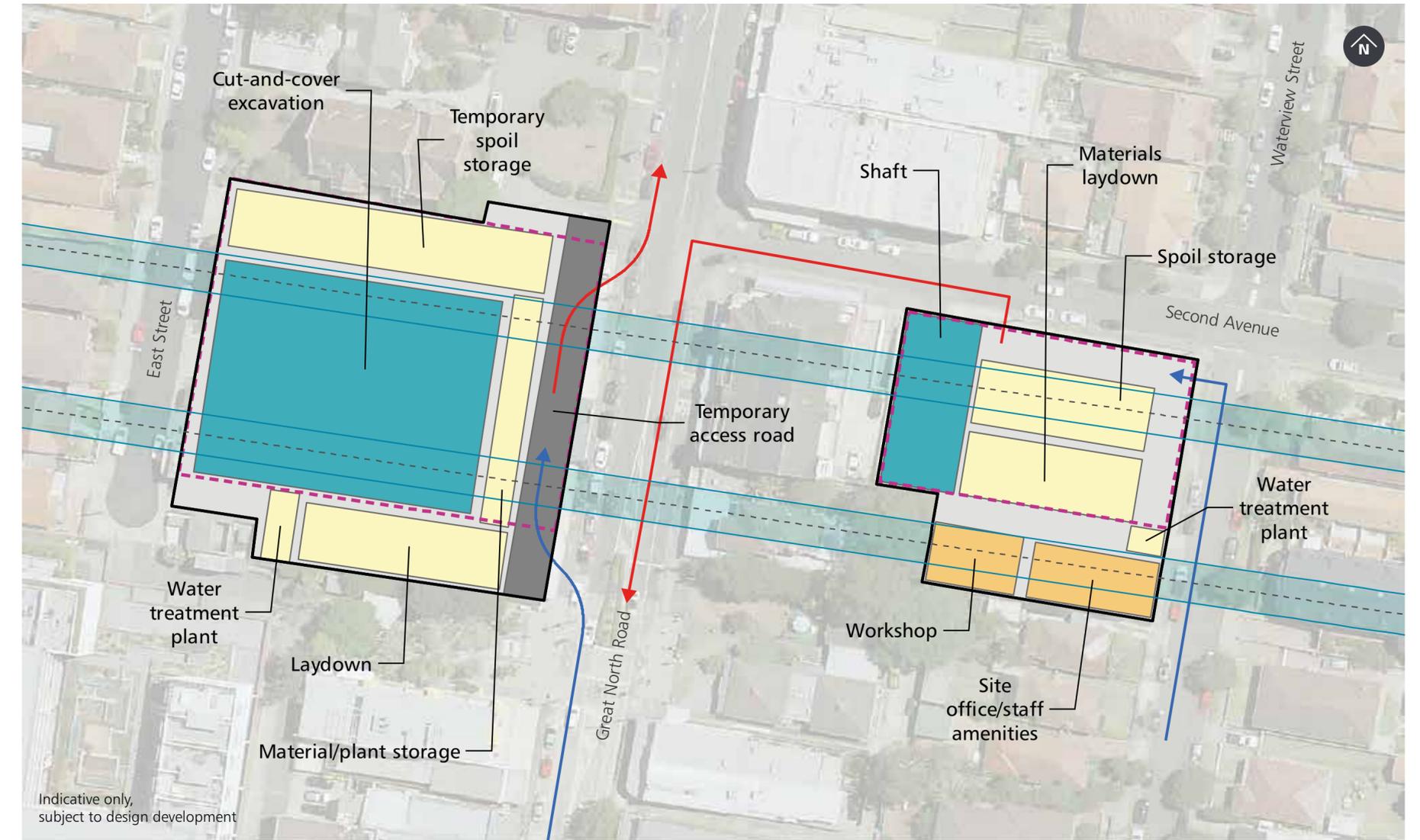
Construction at a glance

Feature	Description
Size	Western site – 4,150 square metres (m ²) Eastern site – 2,150 square metres (m ²)
Site access	Western site Great North Road: left-in, left-out Eastern site Waterview Street: left-in Second Avenue to Great North Road: left-out
Proposed construction hours	Site establishment: Monday to Friday 7am–6pm and Saturday 8am–1pm, occasionally work may be required outside of standard construction hours Demolition: Monday to Friday 7am–6pm and Saturday 8am–1pm Excavation: 24 hours per day Spoil removal: 24 hours The community would be provided with advanced notice of planned construction hours and work
Proposed truck movements	Site establishment and demolition: 272 trucks per day and 64 light vehicles per day Excavation: 422 trucks per day and 272 light vehicles per day Haulage routes would minimise the use of local and residential streets where possible
Proposed demolition	11 buildings
Indicative heritage impacts	No identified direct impacts Aboriginal and non-Aboriginal archaeological remains are not expected in this location
Proposed landscape changes	Trees and other vegetation would be removed within the identified construction site Opportunities for the retention and protection of existing street trees and trees within the construction site would be identified prior to construction along with opportunities to replace trees in the nearby communities in consultation with the local council

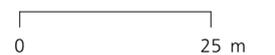
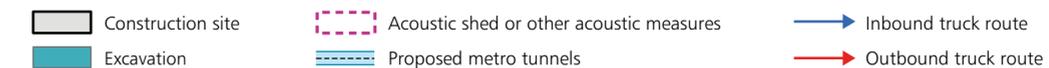
Feature	Description																											
Proposed excavation	Binocular																											
Indicative spoil removal	Excavation: 165,000 cubic metres (m ³)																											
Proposed activities	Site establishment and demolition – installing hoarding, demolishing buildings, protecting and/or relocating utilities, transport network modifications, conducting investigations, installing staff facilities and services to the construction site, installing piles and initial excavation Excavating the station shaft – to a depth of 30 metres (approximately 10 storeys) Excavating binocular caverns – using a roadheader and/or rock hammers Removing spoil – via trucks																											
Proposed staff facilities	Offices, lunch rooms and amenities																											
Proposed staff parking	A small number of parking spaces for use by engineers and other management staff on site Contractors may consider 'park and shuttle' services to transfer workers to this site																											
Indicative utility and power supply	New water, sewer and telecommunications connections to the construction site Power would be supplied from existing Ausgrid cables located underground in Great Northern Road																											
Proposed traffic changes	No changes																											
Indicative utility works	Protection and/or relocation of existing power, communications, gas, water, sewer and stormwater systems																											
Indicative plant and equipment	<table border="0"> <tr> <td>Pumps</td> <td>Crawler crane</td> <td>Dust scrubber</td> </tr> <tr> <td>Excavator</td> <td>Concrete cutter</td> <td>Ventilation fan</td> </tr> <tr> <td>Conveyors</td> <td>Concrete pump</td> <td>Jumbo drill rig</td> </tr> <tr> <td>Jackhammer</td> <td>Portal crane</td> <td>Concrete boom pump</td> </tr> <tr> <td>Compressor</td> <td>Rock breaker</td> <td>Front end loader</td> </tr> <tr> <td>Bulldozer</td> <td>Diesel generator</td> <td>Articulated dump truck</td> </tr> <tr> <td>Roadheader</td> <td>Water treatment</td> <td>Sub-surface concrete truck</td> </tr> <tr> <td>Piling rig</td> <td>Air track drill</td> <td>Mobile elevated platforms</td> </tr> <tr> <td>Mobile crane</td> <td>Shotcrete robot</td> <td></td> </tr> </table>	Pumps	Crawler crane	Dust scrubber	Excavator	Concrete cutter	Ventilation fan	Conveyors	Concrete pump	Jumbo drill rig	Jackhammer	Portal crane	Concrete boom pump	Compressor	Rock breaker	Front end loader	Bulldozer	Diesel generator	Articulated dump truck	Roadheader	Water treatment	Sub-surface concrete truck	Piling rig	Air track drill	Mobile elevated platforms	Mobile crane	Shotcrete robot	
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Roadheader	Water treatment	Sub-surface concrete truck																										
Piling rig	Air track drill	Mobile elevated platforms																										
Mobile crane	Shotcrete robot																											
Proposed public transport changes	No changes																											
Proposed street parking changes	Great North Road – temporary removal of around 12 on-street car parking spaces adjacent to the Five Dock Station western construction site to allow trucks to enter and exit the construction site safely Waterview Street and Second Avenue – temporary removal of around 10 on-street car parking spaces adjacent to the Five Dock Station eastern construction site to allow trucks to enter and exit the construction site safely																											
Proposed noise management	Sydney Metro branded hoarding would be erected around the perimeter of the construction site An acoustic shed and/or other acoustic measures would be in place																											
Indicative pedestrian and cyclist changes	No changes																											
Other projects and plans in the local area	Five Dock Town Centre Urban Design Study																											



Construction site map



Indicative only, subject to design development

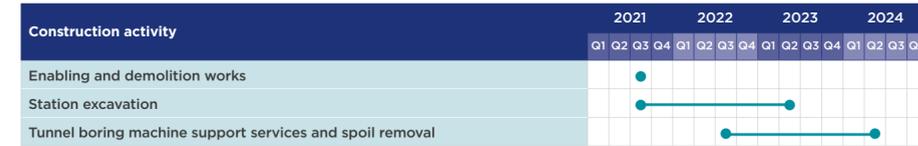


The Bays Station and tunnel boring machine launch site

The proposed Bays Station would be located between Glebe Island and White Bay Power Station with an entrance to the south of White Bay. It would provide direct access to the proposed future Bays Waterfront Promenade, which would run north to south along White Bay. The Bays Station would be the main link into this new precinct as well as serving the

communities of Balmain, Rozelle and Blackwattle Bay. Almost 100 hectares of land at The Bays will be regenerated to become Sydney's newest harbourside business, technology and education hub, with new homes, retail and lifestyle opportunities. This transformation will happen over the next 20-30 years.

Indicative construction timeframe for Stage 1 works*



*Indicative construction timeframes for Stage 2 and Stage 3 works would be subject to further design development and the environmental assessment process.

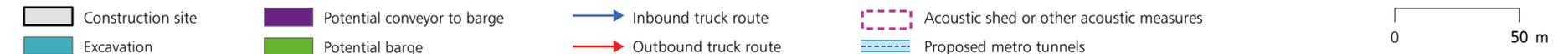
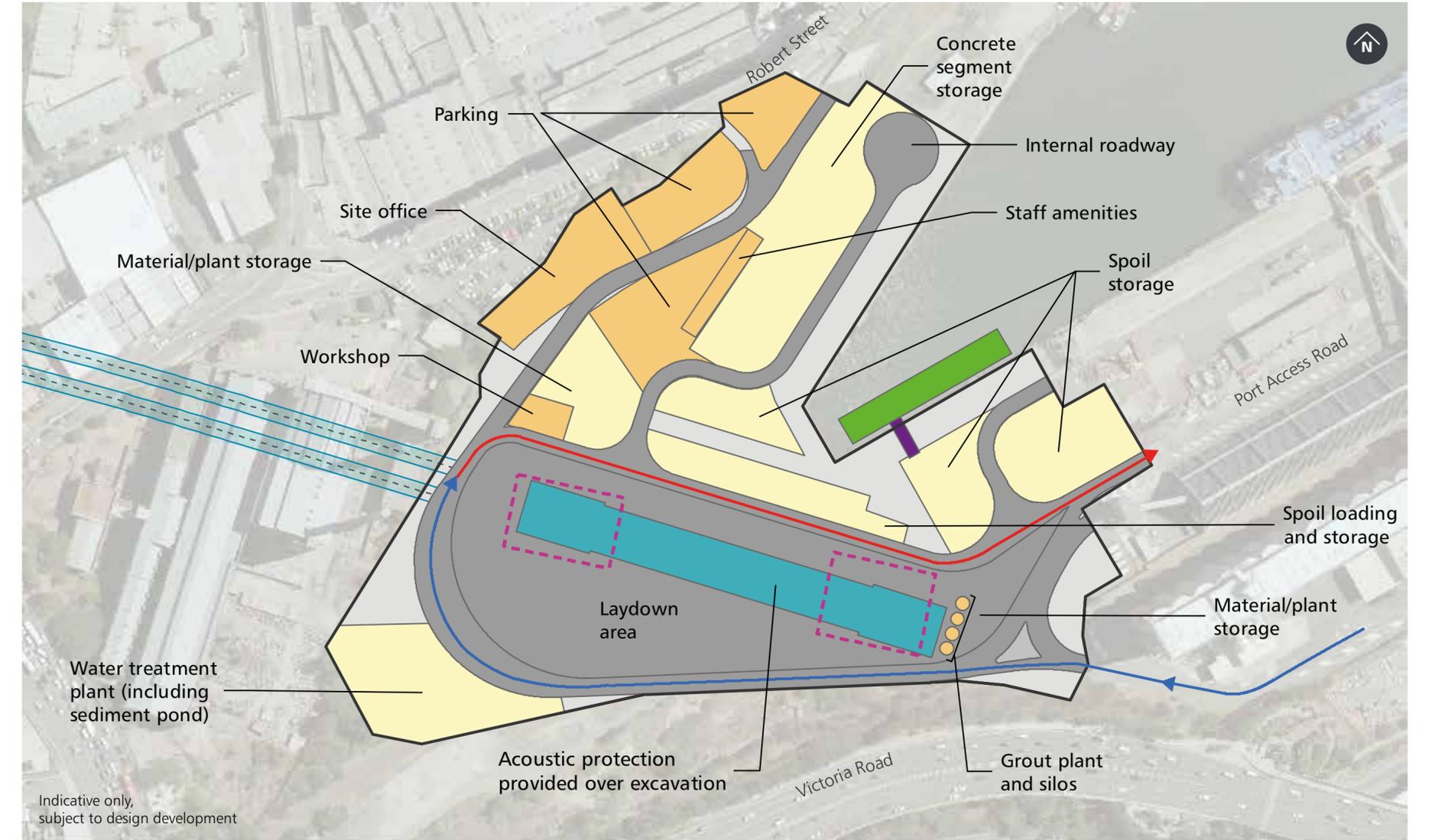
Construction at a glance

Feature	Description
Size	61,200 square metres (m ²)
Site access	James Craig Road via Port Access Road
Proposed construction hours	Site establishment: Monday to Friday 7am-6pm and Saturday 8am-1pm, occasionally work may be required outside of standard construction hours Demolition: Monday to Friday 7am-6pm and Saturday 8am-1pm Excavation and tunnelling: 24 hours a day Spoil removal: 24 hours a day The community would be provided with advanced notice of planned construction hours and work
Proposed truck movements	Site establishment and demolition: 148 trucks per day and 116 light vehicles per day Excavation: 420 trucks per day and 142 light vehicles per day Tunnelling: 990 trucks per day and 251 light vehicles per day Haulage routes would minimise the use of local and residential streets where possible
Proposed demolition	No buildings would be demolished
Indicative heritage impacts	The proposal would have a direct impact on the landscape and yards around the White Bay Power Station, this would not affect the building and the building would be protected during construction This site may contain potential Aboriginal and non-Aboriginal archaeological deposits. Investigation work would be carried out prior to construction work occurring and any remains found would be interpreted by the relevant specialists
Proposed landscape changes	Trees and other vegetation would be removed within the identified construction site Opportunities for the retention and protection of existing street trees and trees within the construction site would be identified prior to construction along with opportunities to replace trees in the nearby communities in consultation with the local council
Proposed excavation	Cut-and-cover

Feature	Description																														
Indicative spoil removal	Excavation: 155,000 cubic metres (m ³) Tunnelling: 860,000 cubic metres (m ³)																														
Proposed activities	Site establishment and demolition - installing hoarding, demolishing buildings, protecting and/or relocating utilities, transport network modifications, conducting investigations, installing staff facilities and services to the construction site, installing piles and initial excavation Excavating the station box - to a depth of 30 metres (approximately 10 storeys) Launching two tunnel boring machines from the excavated station box Providing tunnelling support - spoil storage, ventilation, grout batching and water treatment Removing spoil - via trucks																														
Proposed staff facilities	Offices, lunch rooms and amenities																														
Proposed staff parking	A small number of parking spaces for use by engineers and other management staff on site Contractors may consider 'park and shuttle' services to transfer workers to this site																														
Indicative utility and power supply	New water, sewer and telecommunications connections to the construction site Power would be supplied from Ausgrid's Rozelle sub-transmission substation																														
Proposed traffic changes	Port Access Road and Solomons Way - phased road works are proposed to be undertaken near the port at White Bay subject to a separate environmental planning process																														
Indicative utility works	Protection and/or relocation of existing power, communications, water, sewer and stormwater																														
Indicative plant and equipment	<table border="1"> <tbody> <tr> <td>Pumps</td> <td>Piling rig</td> <td>Air track drill</td> </tr> <tr> <td>Excavator</td> <td>Tele-handler</td> <td>Shotcrete robot</td> </tr> <tr> <td>Bulldozer</td> <td>Rock breaker</td> <td>Dust scrubber</td> </tr> <tr> <td>Conveyors</td> <td>Mobile crane</td> <td>Ventilation fan</td> </tr> <tr> <td>Jackhammer</td> <td>Concrete cutter</td> <td>Jumbo drill rig</td> </tr> <tr> <td>Compressor</td> <td>Crawler crane</td> <td>Concrete boom pump</td> </tr> <tr> <td>Concrete pump</td> <td>Diesel generator</td> <td>Articulated dump truck</td> </tr> <tr> <td>Portal crane</td> <td>Water treatment</td> <td>Mobile elevated platforms</td> </tr> <tr> <td>Flatbed trucks</td> <td>Front end loader</td> <td>Sub-surface concrete truck</td> </tr> <tr> <td>Access lift</td> <td></td> <td></td> </tr> </tbody> </table>	Pumps	Piling rig	Air track drill	Excavator	Tele-handler	Shotcrete robot	Bulldozer	Rock breaker	Dust scrubber	Conveyors	Mobile crane	Ventilation fan	Jackhammer	Concrete cutter	Jumbo drill rig	Compressor	Crawler crane	Concrete boom pump	Concrete pump	Diesel generator	Articulated dump truck	Portal crane	Water treatment	Mobile elevated platforms	Flatbed trucks	Front end loader	Sub-surface concrete truck	Access lift		
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Flatbed trucks	Front end loader	Sub-surface concrete truck																													
Access lift																															
Proposed public transport changes	No changes																														
Proposed street parking changes	No changes																														
Proposed noise management	Sydney Metro branded hoarding would be erected around the perimeter of the construction site An acoustic shed and/or other measures would be constructed																														
Indicative pedestrian and cyclist changes	No changes																														
Other projects and plans in the local area	The Bays Urban Transformation Plan WestConnex M4-M5 Link Sydney Metro City & Southwest Western Harbour Tunnel and Beaches Link Glebe Island Multi-user Facility																														



Construction site map





Project corridor and tunnel alignment

Hills Showground Station tunnel.

Proposed corridor and tunnel alignment

Just as a railway line on the surface follows a path, the tunnels from Westmead to The Bays will run through an underground rail alignment.

A proposed underground tunnel alignment and underground corridor have been identified to deliver the Sydney Metro West tunnels in a way that minimises impacts to the environment and existing infrastructure and buildings.

The proposed tunnel alignment between Westmead and The Bays is being assessed as part of the Stage 1 Environmental Impact Statement. The tunnel alignment would be confirmed after this assessment and following further design.

Sydney Metro is also seeking an amendment to the State Environmental Planning Policy (Infrastructure) to protect a tunnel corridor of approximately 25 metres from the proposed tunnel alignment to provide for the long-term protection of the tunnels.

The corridor would not affect the current use of land for the majority of property owners.

A protected corridor would mean that any development application lodged for a property located within the corridor would need to be referred to Sydney Metro to assess for any potential impact of underground structures to the tunnels.

A development application may be required to be altered if it is deemed to affect the proposed Sydney Metro West tunnel alignment. This may include restrictions to underground structures like basements and car parks.

The proposed tunnel alignment and corridor is shown in the maps on pages 80 to 87.

Properties above the confirmed tunnel alignment

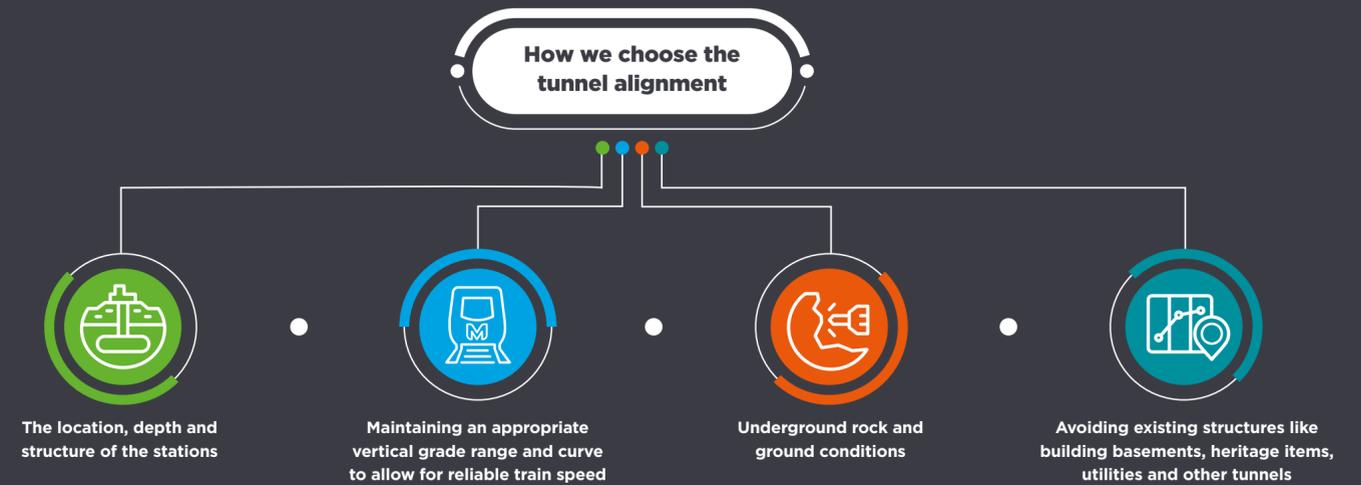
Sydney Metro would conduct a formal process to acquire underground land for the tunnel alignment once the tunnel alignment design is confirmed. The project team would contact all affected property owners directly.

In the majority of cases, underground land acquisition would not affect the future use of the property. Sydney Metro would only acquire the land it needs to safely construct the tunnels and provide for their long-term protection.

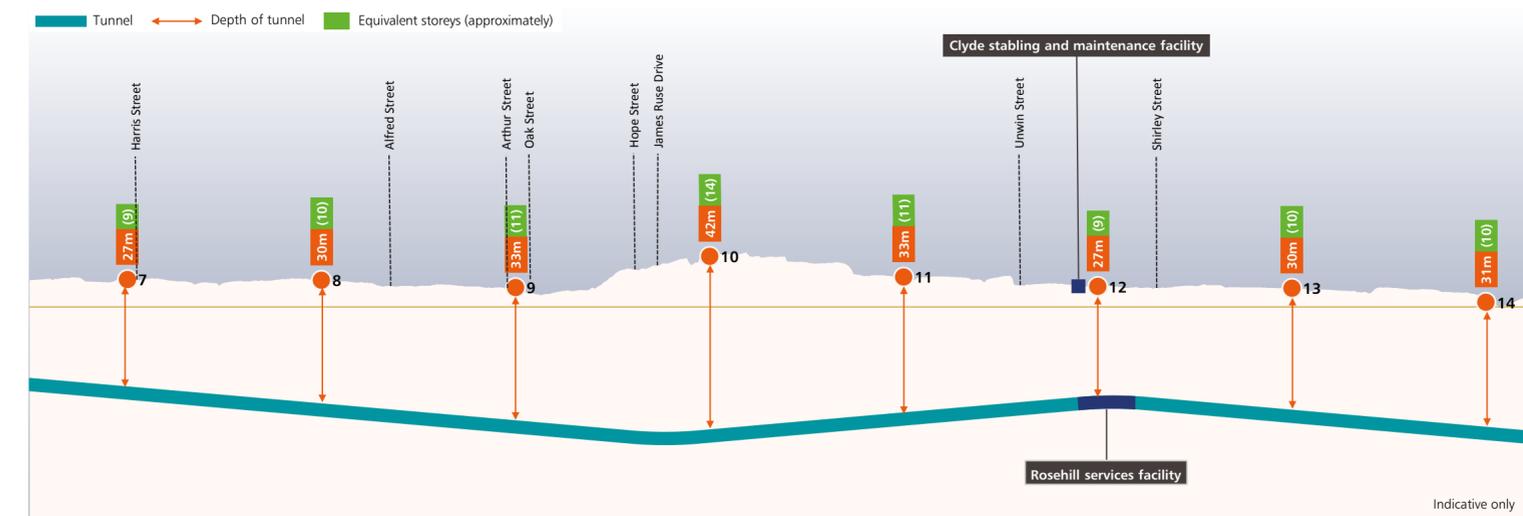
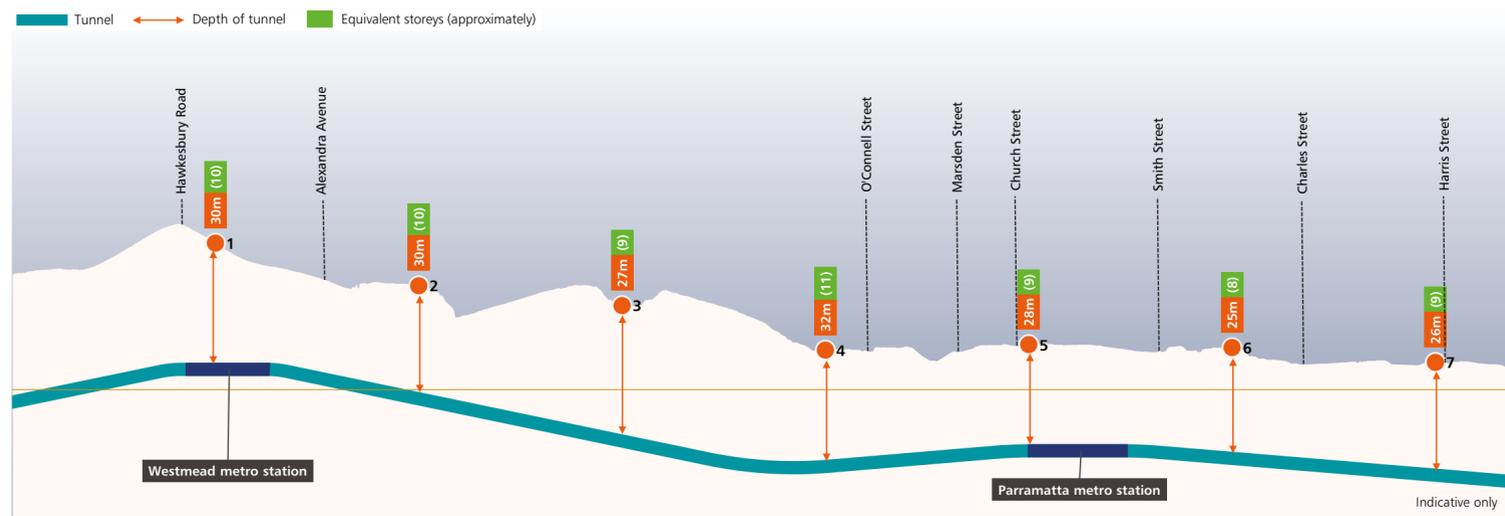
Process for confirming the tunnel alignment between Westmead and The Bays



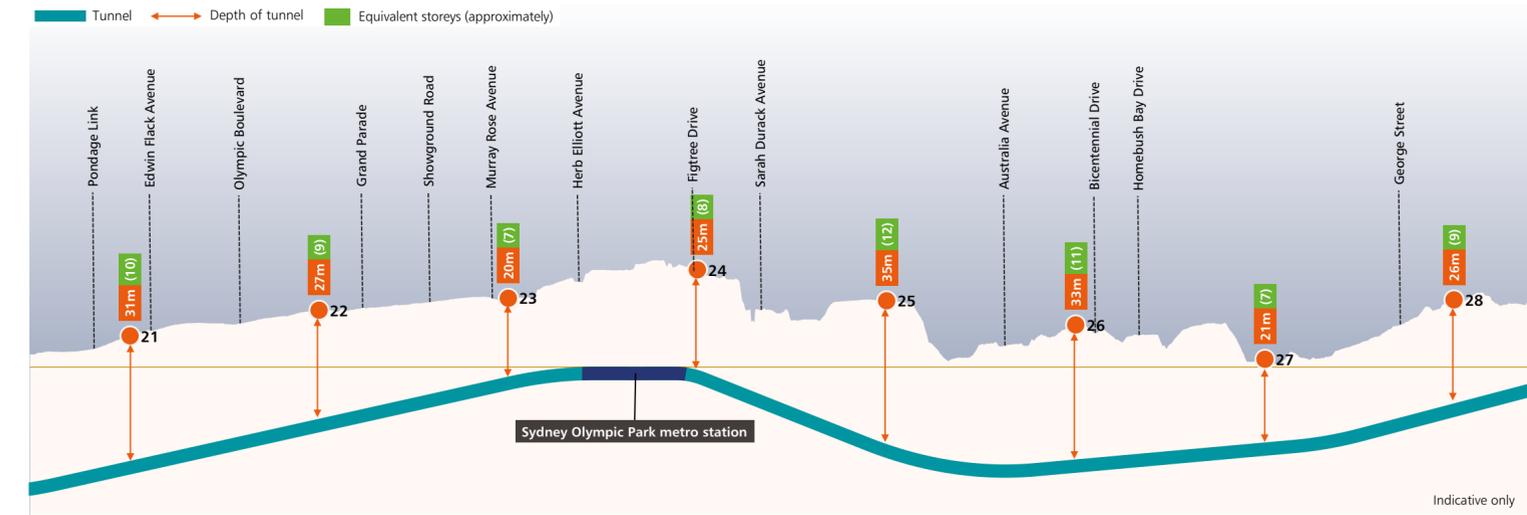
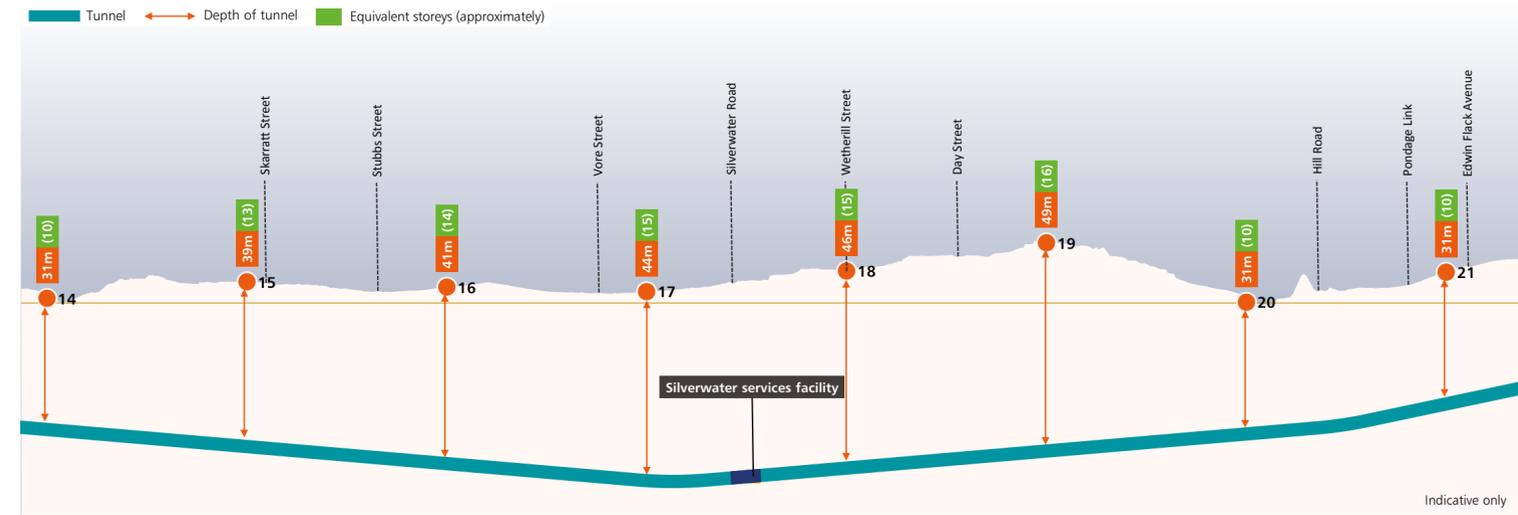
Cavern view of progress works on the Sydney Metro City & Southwest project.



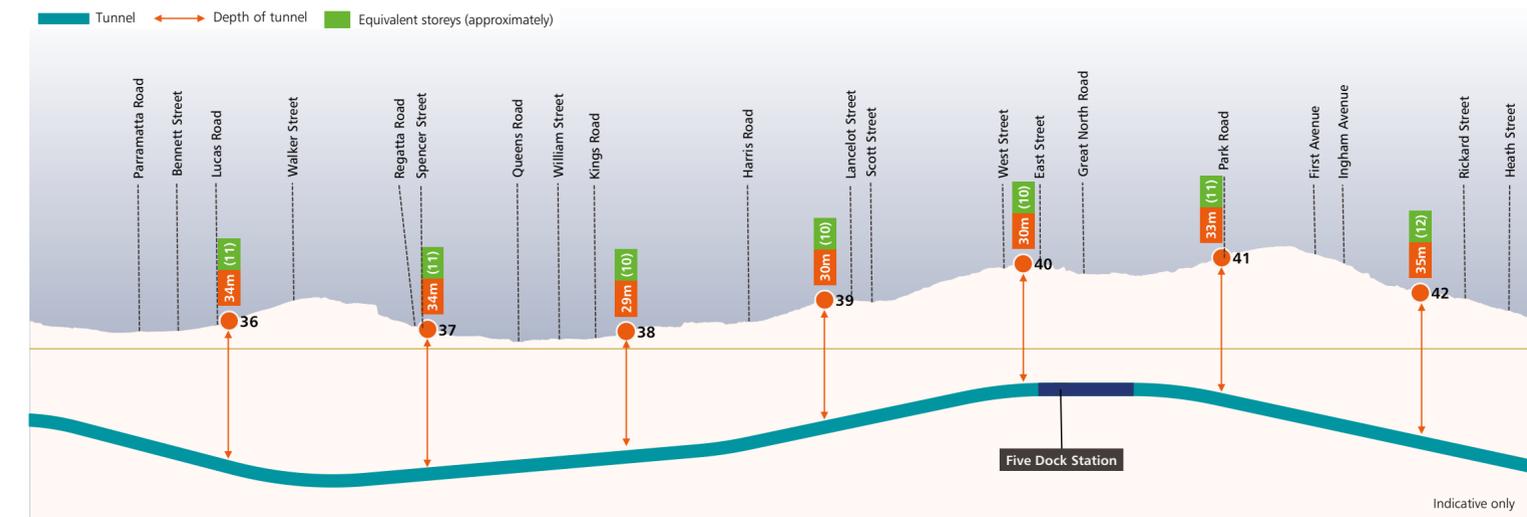
Westmead to Clyde tunnel and corridor alignment



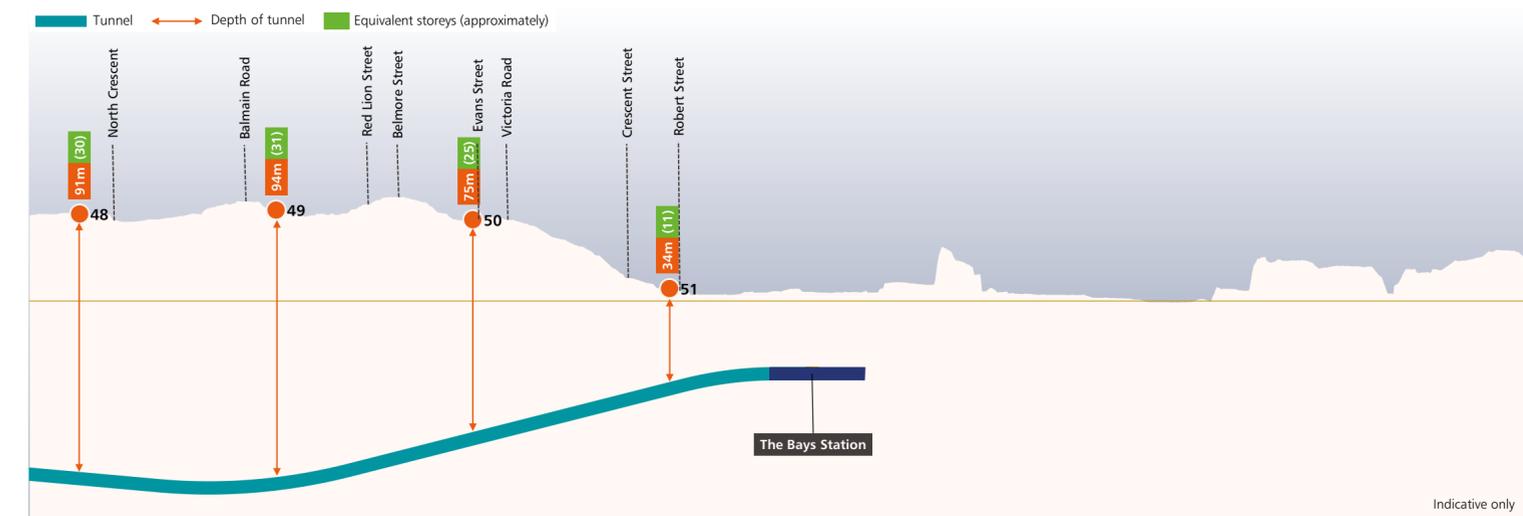
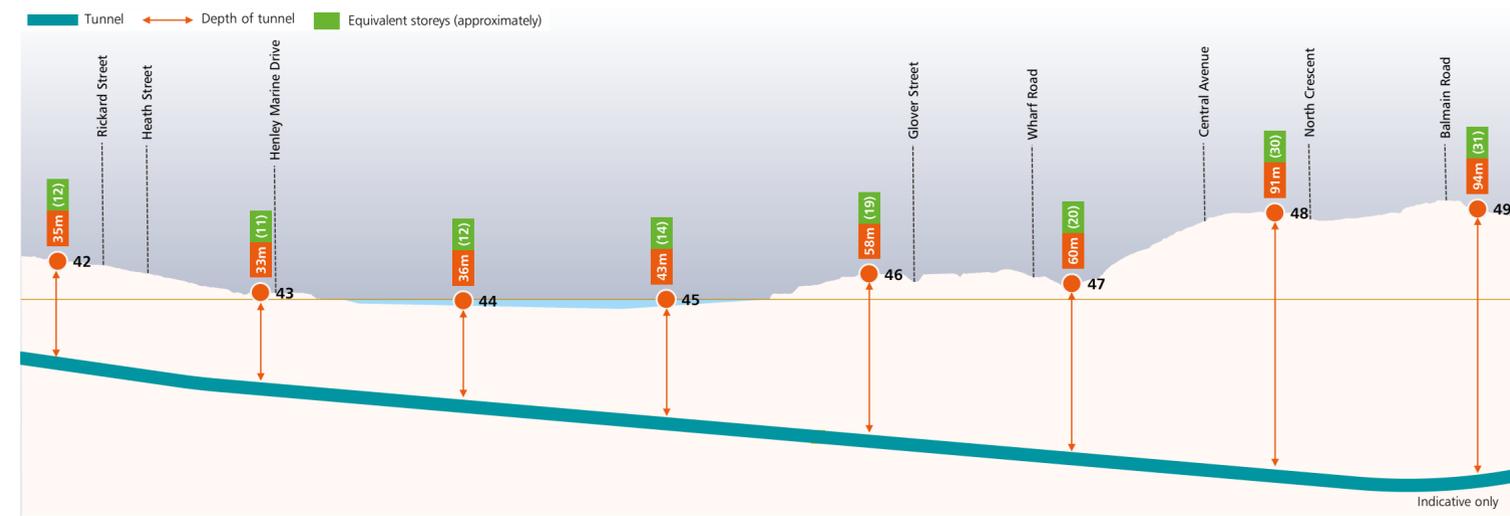
Silverwater to Sydney Olympic Park tunnel and corridor alignment



North Strathfield to Five Dock tunnel and corridor alignment



Five Dock to The Bays tunnel and corridor alignment



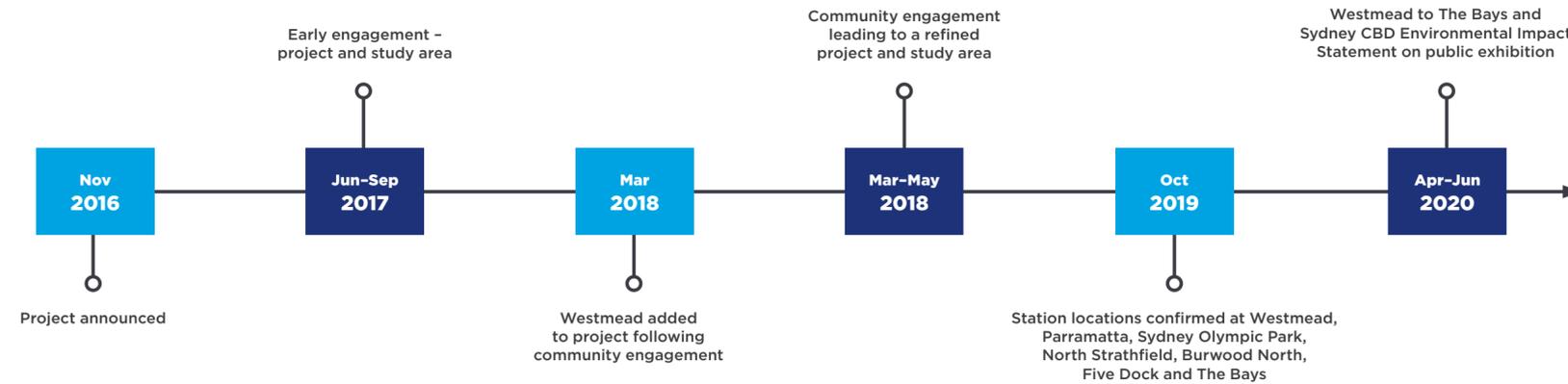


Working with the community and stakeholders

Working with the community and stakeholders

Sydney Metro West has been engaging with the community, stakeholders and industry since 2017. Feedback gathered helped shape the project, including station locations. Sydney Metro will continue to work with the community and stakeholders to receive further feedback about the project. Submissions are also encouraged during formal exhibition phases of the project (see page 97).

Sydney Metro West community engagement



During early engagement

 **1,700** surveys were completed

 **1,000+** submissions and comments were received

 **1,500+** people visited information sessions

Place managers

Sydney Metro West has dedicated community relations specialists called place managers who can be contacted for further information about the project. Their role is to act as a single, direct contact between members of the community and the project team. They can be contacted on **1800 612 173** or via the project email sydneymetrowest@transport.nsw.gov.au.



Community event for the Sydney Metro City & Southwest project.

How we connected with you

-  held local community information sessions
-  met with local community groups
-  delivered project information to letterboxes
-  placed project advertisements in local and culturally and linguistically diverse newspapers
-  sent email updates to our registered database
-  posted information on social media
-  undertook surveys seeking feedback
-  provided information on the project website

What you have told us

It will help get me to uni faster

Reducing commute times means I get more time with my family and to myself

I think it will make the area better and reduce congestion

Community values are important to consider when designing the stations

Walking and cycling routes to stations would make the area a destination

The character of local areas and landscaping needs to be considered in the designs

I think this will reduce cars on the road over the long term - Parramatta Road is a concern

Interchanges with other transport modes and connections to stations are important to consider

Local impacts like parking and traffic are important to me

It will link people with more services, businesses, education and medical facilities

I would like to see future connections, like to Western Sydney Airport

I would like to understand more about construction impacts and further consultation

Stations should be fully accessible



A new Sydney Metro Station.





Have your say

Artist's impression of Sydney Olympic Park metro station.

More about the Environmental Impact Statement

This document is a summary of the Westmead to The Bays and Sydney CBD Environmental Impact Statement (the Environmental Impact Statement). Sydney Metro is making the Environmental Impact Statement and supporting materials as easy to access as possible.

Visit planningportal.nsw.gov.au/major-projects to view the full Environmental Impact Statement.

Visit sydneymetro.info to learn more about Sydney Metro West and sign up for email alerts.

Visit sydneymetro.info/metrowest to view an interactive map of the project, find out what you can expect in your area and learn more from expert members of the project team.

Call us on **1800 612 173** to talk to one of our dedicated place managers.

Email your queries to sydneymetrowest@transport.nsw.gov.au and we'll get back to you.

The Sydney Metro team, including our team of project experts, are here to provide you with information about Sydney Metro, and to help you find out more about the Environmental Impact Statement. If you are having difficulty accessing any of the information available please contact us and we'll make arrangements to assist you.



The Sydney Metro West team is available to answer any questions you may have.



Have your say

The Environmental Impact Statement is on public exhibition until Friday 26 June 2020.

Anyone may make a submission, in any language, about the Environmental Impact Statement to The Department of Planning, Industry and Environment.

The Department will then collate submissions and publish them on their website.

Your submission must reach The Department by Friday 26 June 2020.

How to make a submission

Online: visit planningportal.nsw.gov.au/major-projects and follow the 'on exhibition' links

Write a letter to:

**Planning and Assessment
Department of Planning, Industry and Environment
Locked Bag 5022
Parramatta NSW 2124**

Your letter must include:

1. Your name and address, at the top of the letter only
2. The name of the application and the application number (SSI-10038)
3. A statement on whether you support or object to the proposal
4. The reasons why you support or object to the proposal
5. A declaration of any reportable political donations made in the previous two years.

If you have any questions about this process you can contact The NSW Department of Planning, Industry and Environment.

Call: **1300 305 695**

Email: information@planning.nsw.gov.au

The Department may publish any personal information you have included in your submission on a proposal. Do not include any personal information in your submission that you do not want published.

For more information, view the Department's Privacy Statement at: planning.nsw.gov.au/privacy



Translating and Interpreting Service

If you require the services of an interpreter, please contact the **Translating and Interpreting Service** on **131 450** and ask them to call **Sydney Metro** on **1800 612 173**. The interpreter will then assist you with translation.

Se avete bisogno dell'ausilio di un interprete, vi preghiamo di contattare il **Servizio di Traduzione ed Interpretariato** al numero **131 450** e chiedere di chiamare **Sydney Metro** al numero **1800 612 173**. L'interprete vi assisterà nella traduzione.

আপনার, একজন দোভাষীর (ইন্টারপ্রেটার) সেবা-সাহায্য আবশ্যিক হলে, অনুগ্রহ করে **131 450** নং এ **ট্রান্সলেটিং এন্ড ইন্টারপ্রেটিং সার্ভিস** এর সাথে যোগাযোগ করুন, এবং **1800 612 173** নং এ **সিডনী মেট্রো** কে কল করতে তাদের বলুন। তখন অনুবাদ/ভাষান্তরে, দোভাষী আপনাকে সাহায্য করবে।

如果您需要翻译服务, 请致电**131 450** 翻译和口译服务, 让他们打 **1800 612 173** 给悉尼地铁, 翻译员然后将帮助您进行翻译。

إذا كنتم بحاجة إلى خدمات مترجم, يرجى الاتصال بخدمة الترجمة الكتابية والشفهية على الرقم **131 450** واطلبوا منهم الاتصال بمترو سيدني على الرقم **1800 612 173**. ويعد ذلك سيقوم المترجم بمساعدتكم في الترجمة.

Εάν χρειάζεστε τις υπηρεσίες διερμηνείας, παρακαλείστε να επικοινωνήσετε με την **Υπηρεσία Μεταφραστών και Διερμηνέων** στο **131 450** και ζητήστε τους να καλέσουν το **Sydney Metro** στο **1800 612 173**. Ο διερμηνέας θα σας βοηθήσει στη μετάφραση.

통역서비스가 필요하시면, 번역 및 통역 서비스 (**Translating and Interpreting Service**) 전화 **Translating and Interpreting Service on 131 450** 에 연락하시어 **Sydney Metro** 전화 **1800 612 173** 에 연결해달라고 요청하십시오. 통역관이 통역을 도와 드릴 것입니다.

Nếu quý vị cần dịch vụ thông dịch viên, xin liên lạc **Dịch vụ Thông Phiên Dịch (Translating and Interpreting)** ở số **131 450** và yêu cầu gọi **Sydney Metro** ở số **1800 612 173**. Sẽ có thông dịch viên giúp cho quý vị việc thông dịch.

यदि आपको दुभाषिए की सेवाओं की ज़रूरत है, तो कृपया अनुवाद एवं दुभाषिया सेवा (**Translating and Interpreting Service**) से **131 450** पर संपर्क करें और उन्हें सिडनी मेट्रो **1800 612 173** पर कॉल करने का निवेदन करें। फिर दुभाषिया अनुवाद में आपकी मदद करेगा।

Если Вам необходима помощь переводчика, свяжитесь, пожалуйста, с переводческой службой **Translating and Interpreting Service по телефону 131 450** и попросите их соединить Вас с **Сидней Метро (Sydney Metro) по номеру 1800 612 173**. Затем переводчик поможет вам с переводом

หากท่านจำเป็นต้องใช้บริการล่าม โปรดติดต่อบริการแปลและล่าม **Translating and Interpreting Service** ที่ **131 450** และขอให้หน่วยงานดังกล่าวโทรหา **Sydney Metro** ที่ **1800 612 173** หลังจากนั้นล่ามจะช่วยท่านเกี่ยวกับการแปล

如果您需要口譯員的服務, 請致電**131 450**聯絡翻譯和口譯服務, 要求他們致電 **1800 612 173**給悉尼地鐵 (**Sydney Metro**)。然後口譯員將會協助您翻譯。

