West

Westmead to The Bays and Sydney CBD

Environmental Impact Statement Summary

2020

Contents

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.

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 assessing optional stations at Rydalmere and Pyrmont and further planning is underway to determine the location of a new metro station within the Sydney CBD.

Scan to view

Scan the QR codes throughout this document with a smart device to watch more about Sydney Metro.

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 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**

An interactive portal with key information about the project is also available at: **[insert spatial media link]**


Way out
Use the Lifts


WESTMEAD
Westmead

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 are using it every weekday – taking cars off the roads and making it faster and easier to get to more places.

The Sydney Metro West 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

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 improves the lives of the community for generations to come.

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

Artist’s impression of Westmead metro station.


THE BAYS

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 Parramatta and Sydney CBDs

3.2 million

Western Sydney population, 2036

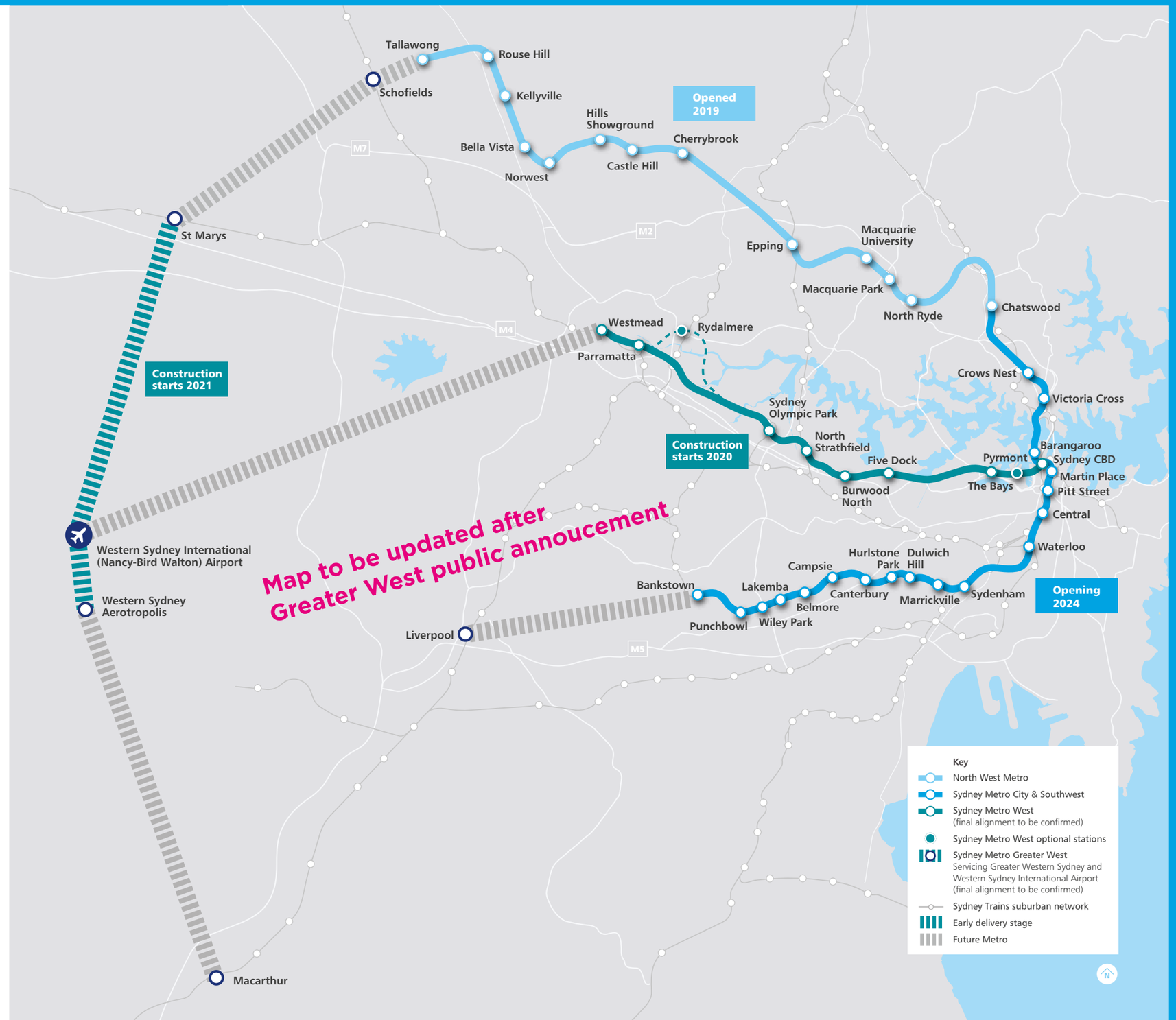
Greater West

(final alignment to be confirmed)

Connecting Western Sydney Airport to the rest of Sydney

Servicing Greater Western Sydney

Opening together with new airport



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.

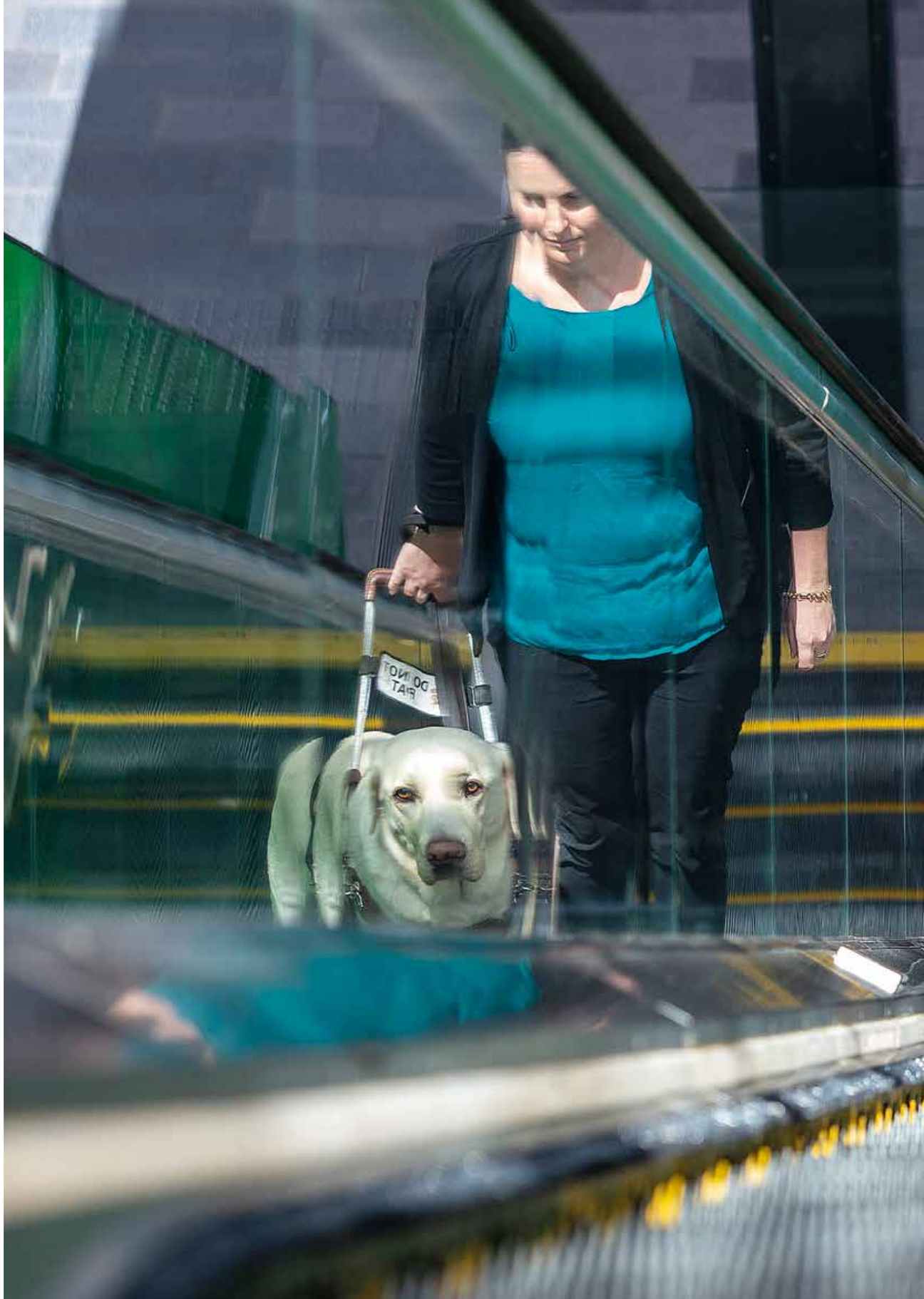
Sydney Metro is the first railway network in Australia to use platform screen doors, which are common around the world.

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.

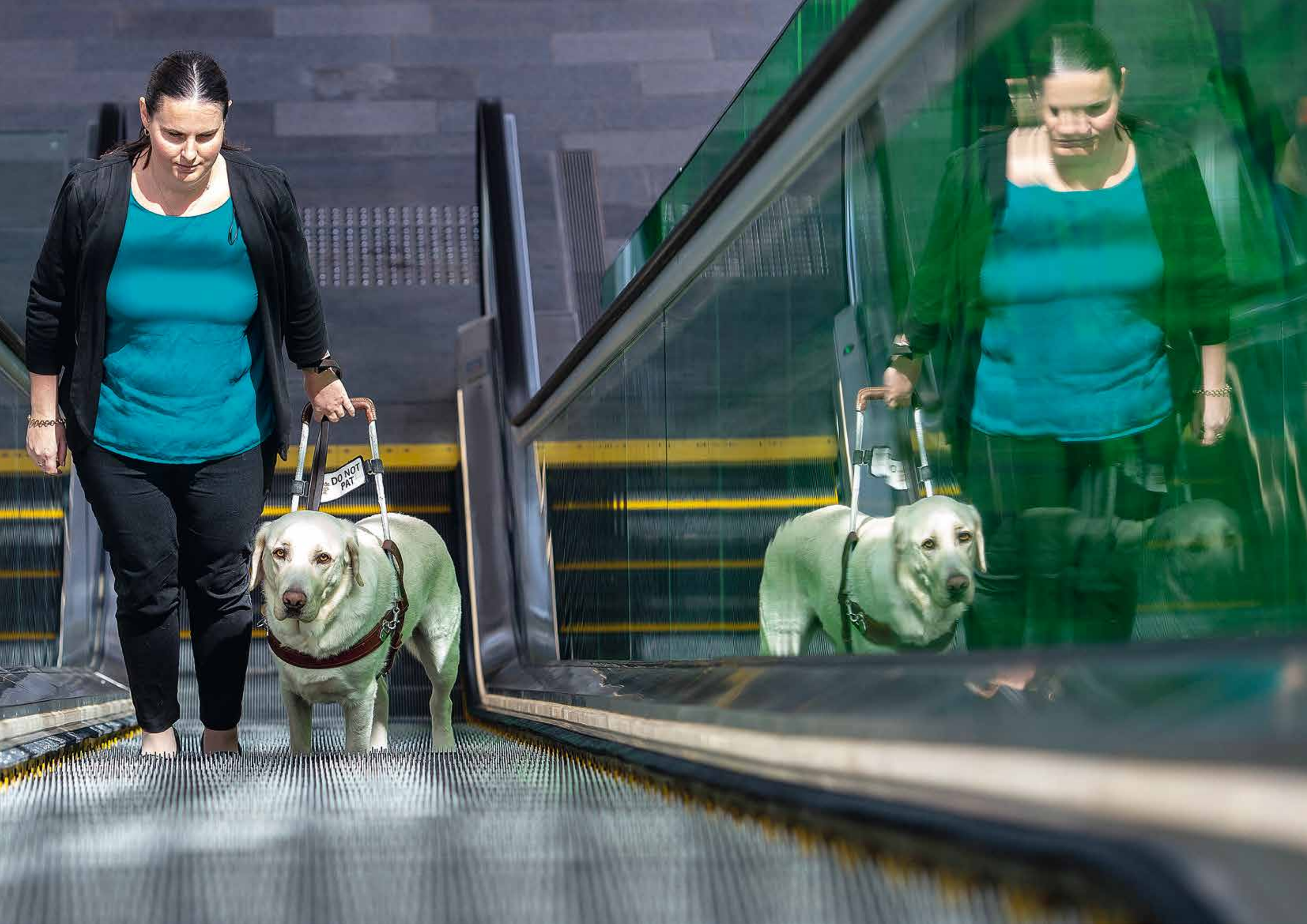
Customer safety is the number one priority for Australia's first fully-automated railway. At all times, a team of expert train controllers monitor the system, making sure everything runs smoothly.

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.


DO NOT
PAT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The customer is at the centre

Get where you need to go, easily and quickly.

Sydney's new metro railway is an easy part of daily journeys and will evolve with the city it will serve for generations to come.

Sydney Metro makes it easier and faster to get around, boosting economic productivity by bringing new jobs and new educational opportunities closer to home.

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.

This door-to-door approach helps customers achieve their daily tasks, whether it's getting to work, meetings, school or education, sport, a day out or running errands – and, of course, getting home.

Making it easy for customers at each stage of their journey is integral to the successful delivery of Sydney Metro.

Linking communities, schools, hospitals, key destinations and businesses with the new metro system is key in attracting and keeping customers as well as in meeting broader transport and land use objectives.

Sydney Metro is working across government and with the community to also get customers to and from metro services easily.

The metro public transport product has been designed to deliver safe, clean, comfortable services which run on time and are convenient, efficient, accessible and easy for customers to use.

Metro stations provide safe and efficient interchange between transport modes, giving priority to pedestrians.

The North West Metro Line officially opened on 26 May 2019, with more than 100,000 passengers taking a ride on the new service on day one.

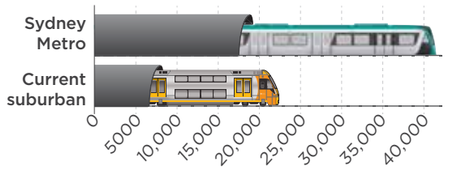

BUS ZONE
NO STOPPING
SUSHI
BURWOOD NORTH
Metro
M
Dairy / Snacks

Sydney Metro West

Artist's impression of Burwood North Station.

A new railway connecting Western Sydney to the city

Doubling rail capacity between Parramatta and the Sydney CBD, moving more than 40,000 people an hour in each direction.



Maximum customers per hour per line

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 Sydney CBDs, 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.

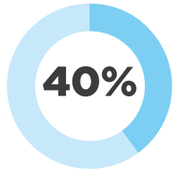
Aerial view of Parramatta.

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.

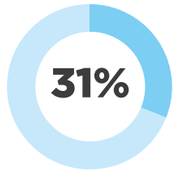
Greater Sydney's population will pass 6 million by 2036; an extra 1.7 million people will progressively move into Australia's biggest city, which will support 840,000 more jobs.

Over the next 15 years, NSW will require infrastructure to support:



more train trips

more car trips



more households.

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 stations 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.

Integrated station and precinct development may be considered above and/or around the station

Station constructed

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.


FIVE DOCK
Express Store
FRESH FRUIT & VEGETABLES
M

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 accessible as possible.

Visit **majorprojects.planning.nsw.gov.au** to view the full Environmental Impact Statement.

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

Visit **[insert spatial media link]** to view an interactive map of the project, find out what you can expect in your area and meet 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.

Check your local paper for updates.

Follow us on Facebook.

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:

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.

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The Stage 3 application (future approval) is expected 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.

Environmental assessment staging

We are here

Concept

The Sydney Metro West Project Concept

Stage 1

Station excavation and tunnelling – Westmead to The Bays

Future applications

Stage 2

Future works Westmead to The Bays

Stage 3

Future works The Bays to Sydney CBD

Centenary Square, Parramatta.

The Concept and Stage 1 planning process

The Sydney Metro West Project Concept from Westmead to the Sydney central business district (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 including 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.

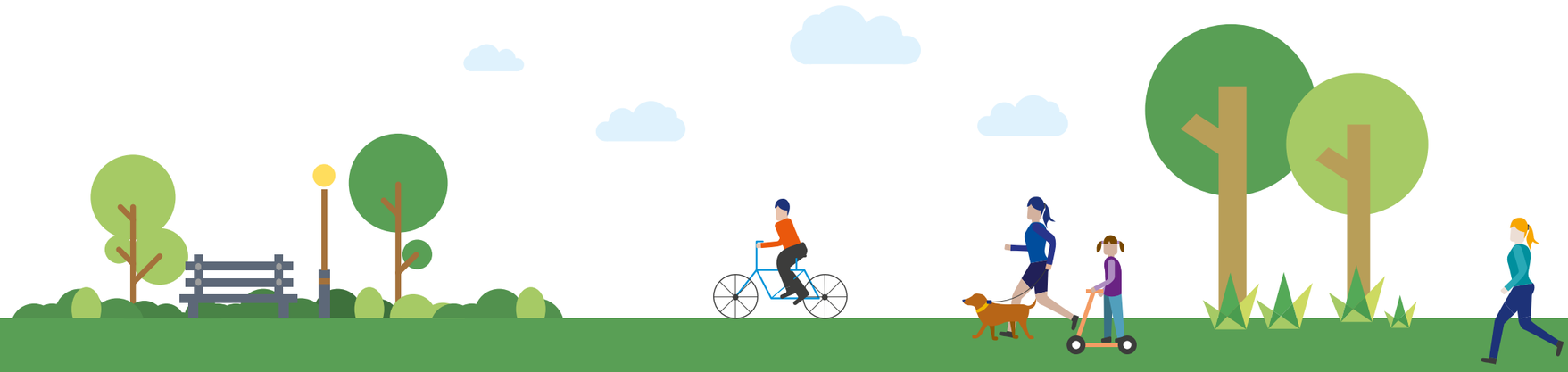
Haulage routes

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 **[insert spatial media link]** 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 the 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.

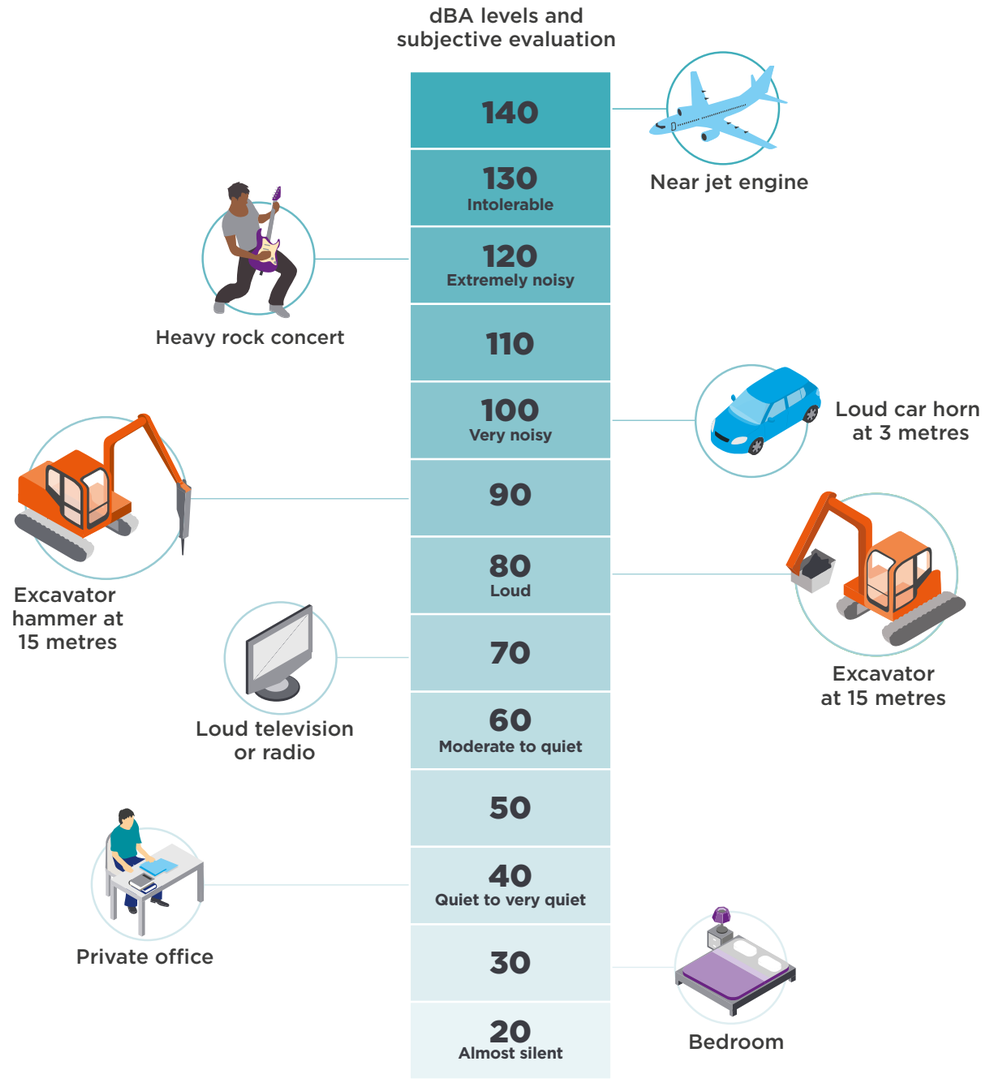
Assessing noise and vibration

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.

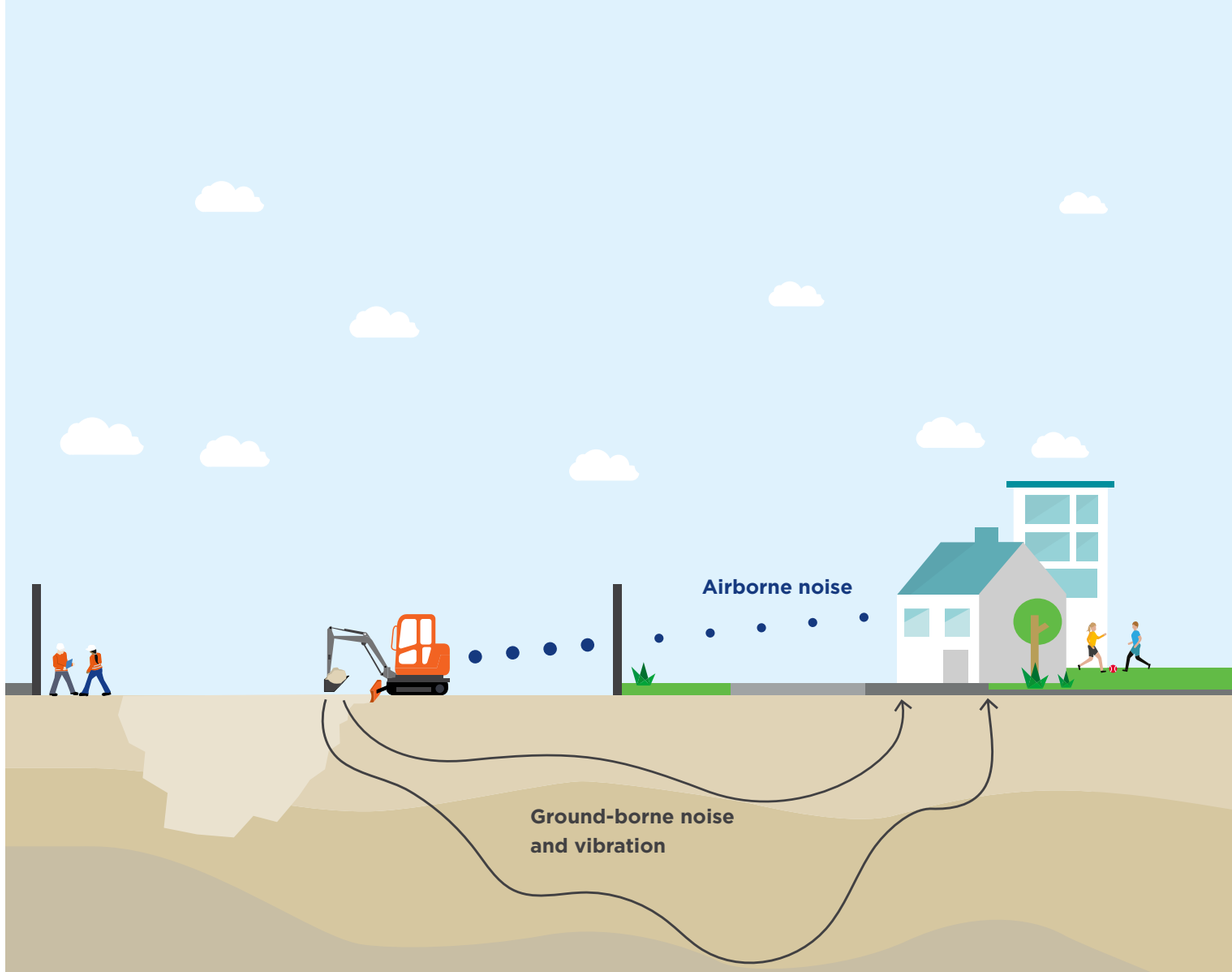
Movement of the TBMs could be more noticeable at night when other noise and movement levels are lower.

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 **[insert spatial media link]** 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 KiaOra 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.

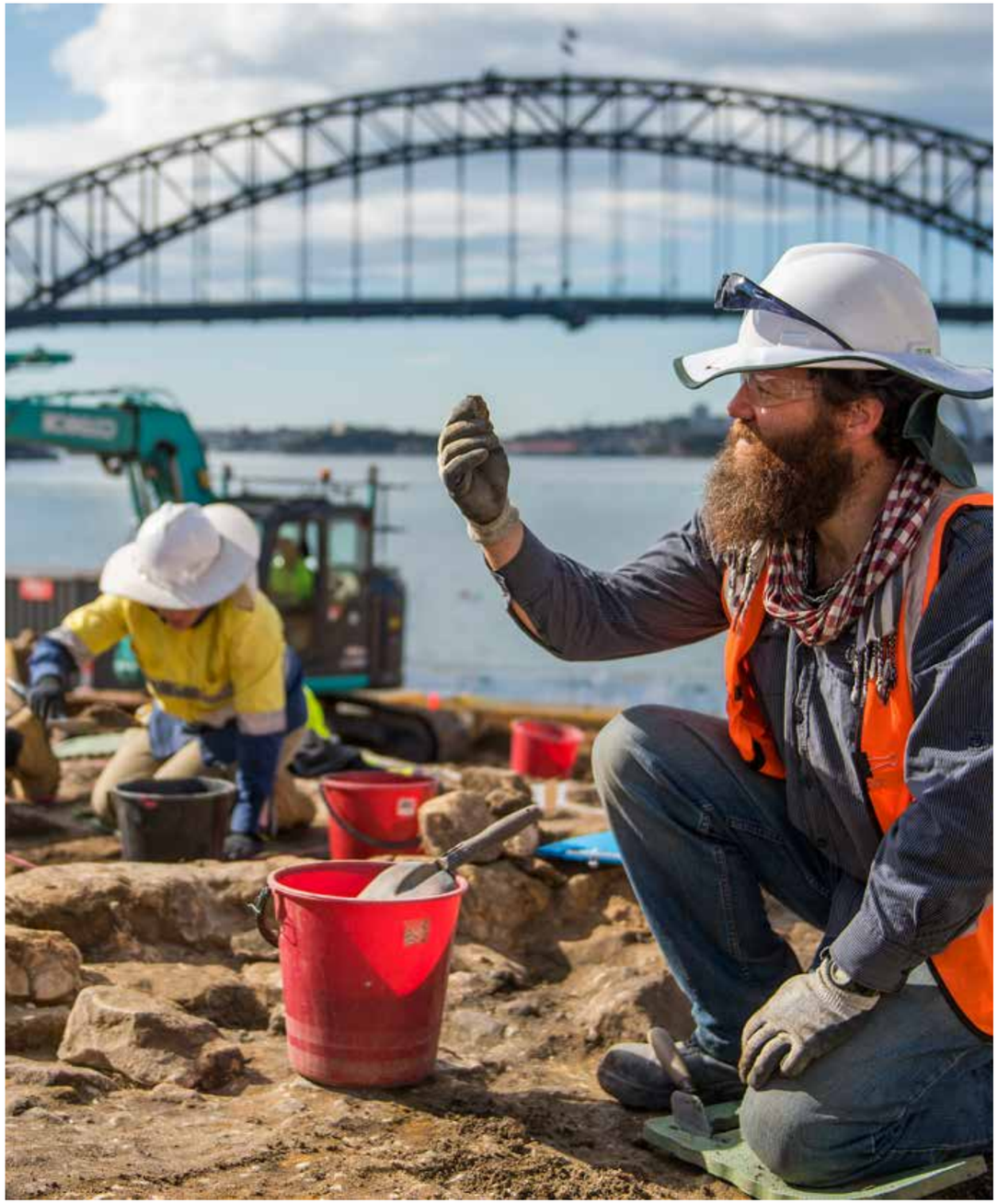
Archaeological remains are largely unexpected across the project. It is possible that archaeological remains could be uncovered at Parramatta or The Bays, in association with the earliest phases of European settlement.

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 **[insert spatial media link]** 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: **[insert spatial media link]** 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** and **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.

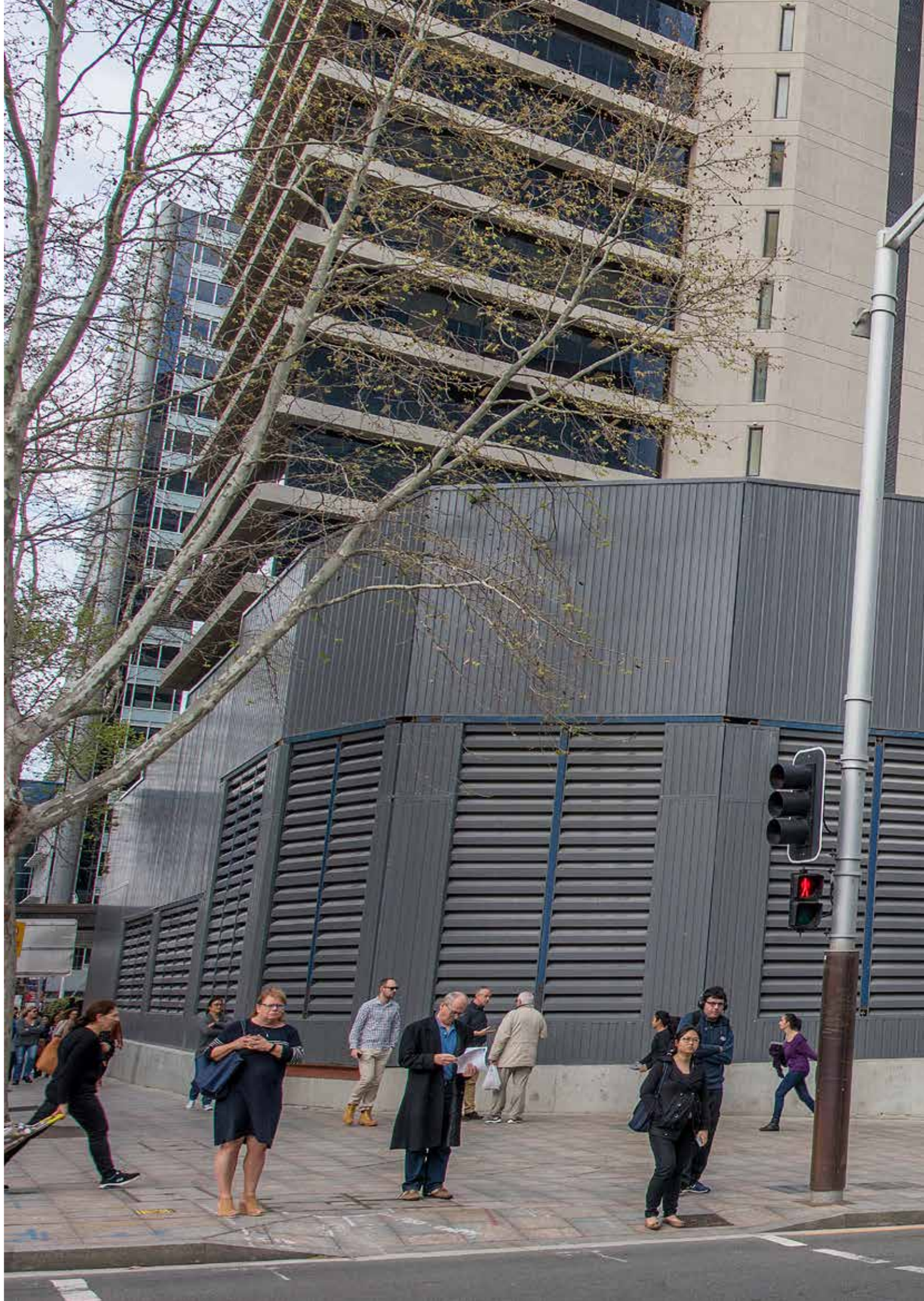
Sealed acoustic sheds

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.


PROGRESSIVE
VIBRANT
HIGH PEDESTRIAN ACTIVITY
40
KEEP LEFT


Welcome to
Barangaroo Stati
NSW
sydney METRO
coateshire
13 15 52

Tunnelling and excavation

Tunnel boring machine (TBM) Mum Shirl.

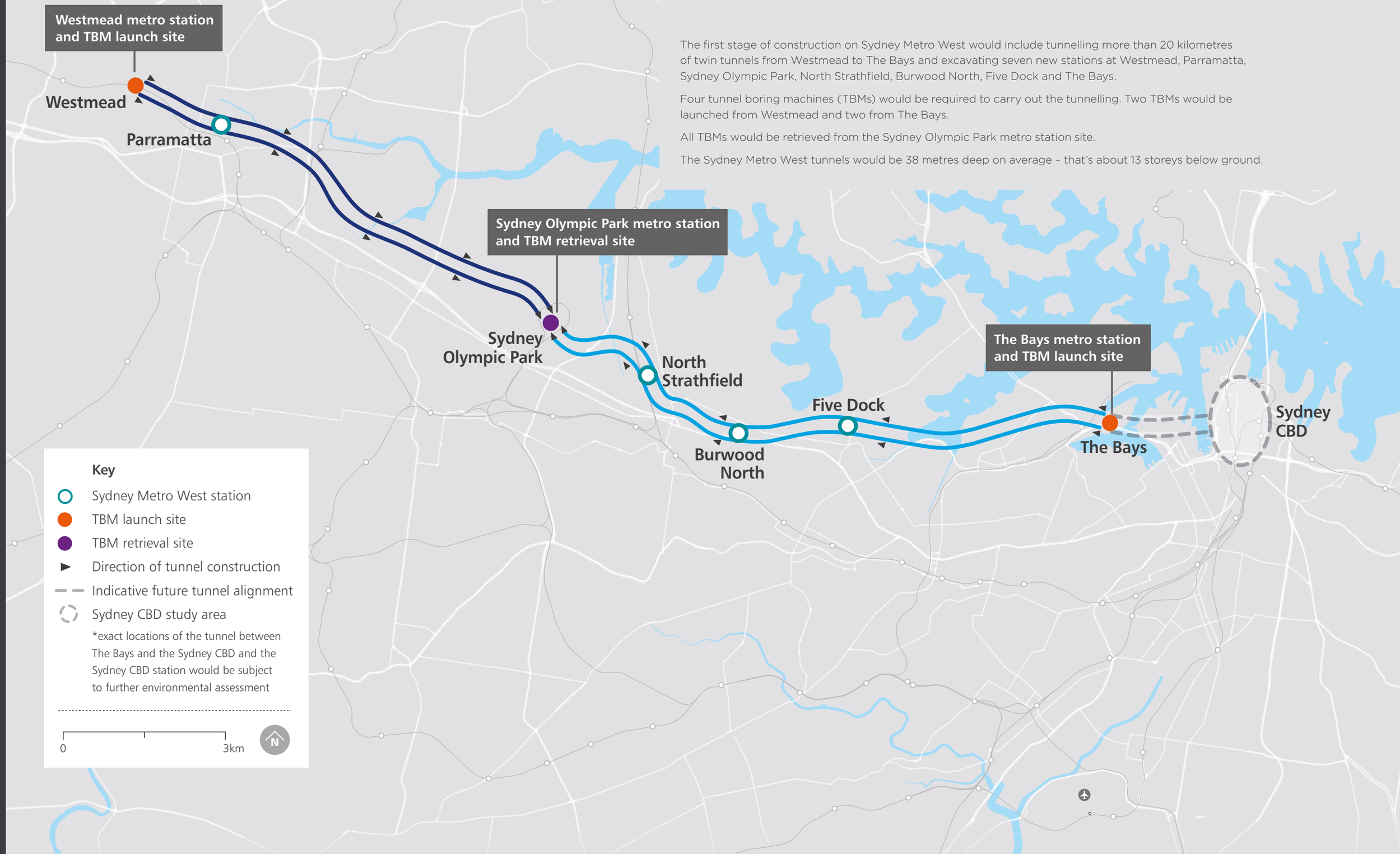
Westmead to The Bays

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 below ground.



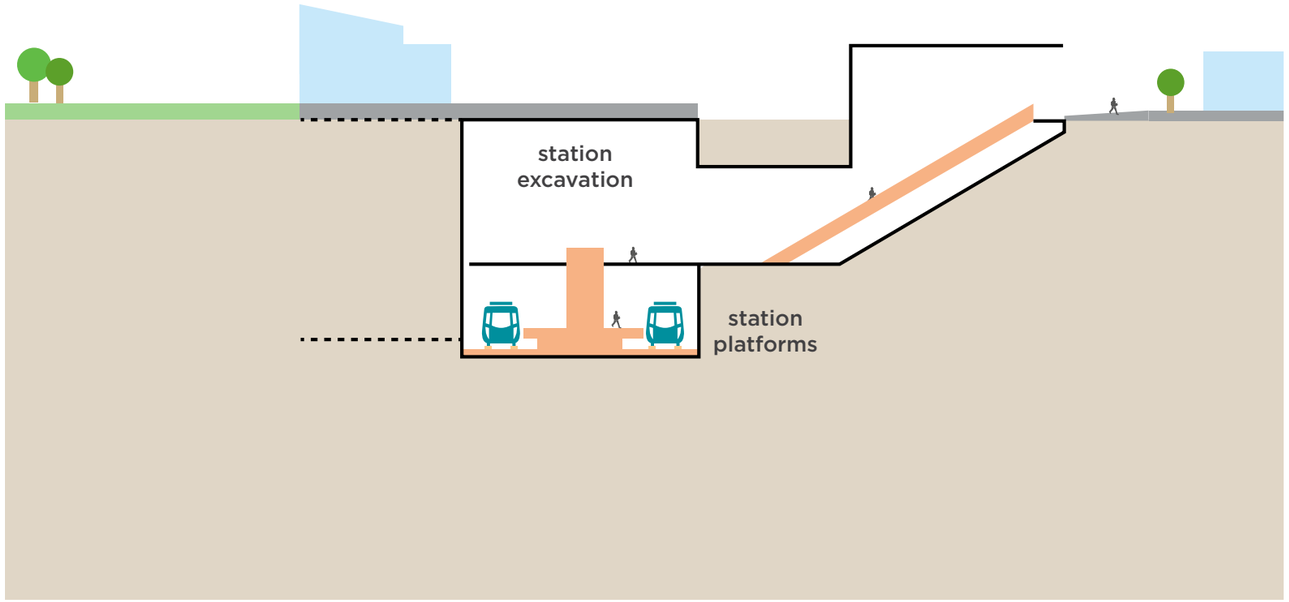
Station excavations

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

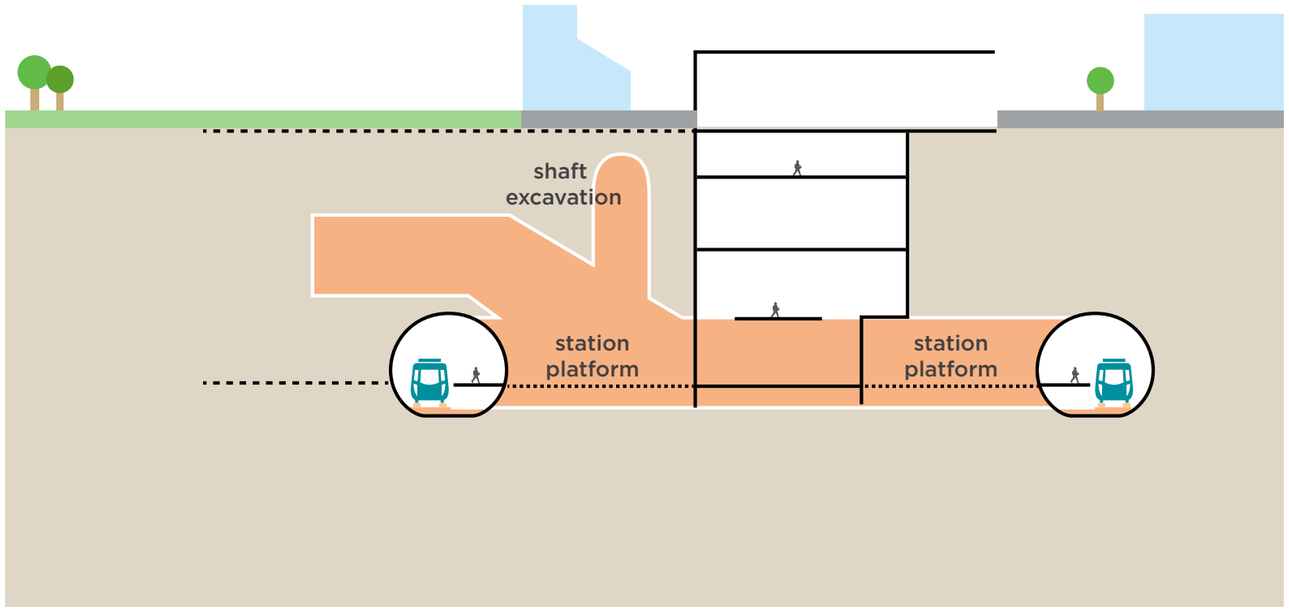
A cut-and-cover station involves excavating a rectangular hole in the ground, which would then house the underground station.

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.

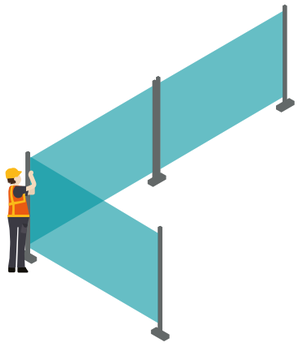
Five Dock would be a **binocular** station.

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

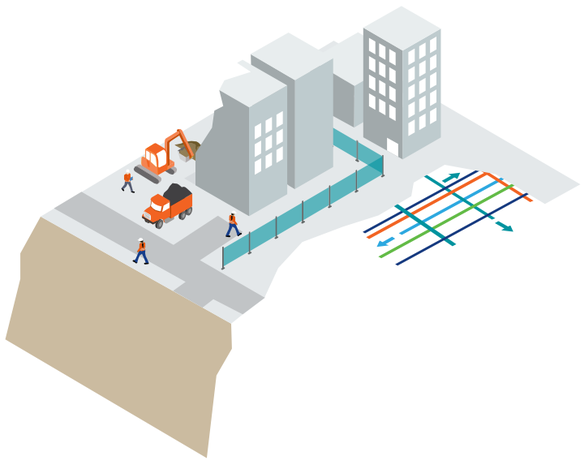
Each TBM would be lowered piece by piece into the excavated station boxes and then assembled. The TBMs would then slowly make their way underground to Sydney Olympic Park, excavating the tunnels as they go. They would then be dismantled piece by piece and lifted out.

Building the stations – Site preparation for all stations

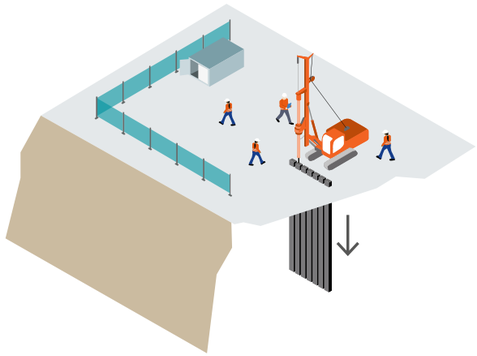
1 Set up site fencing and hoarding



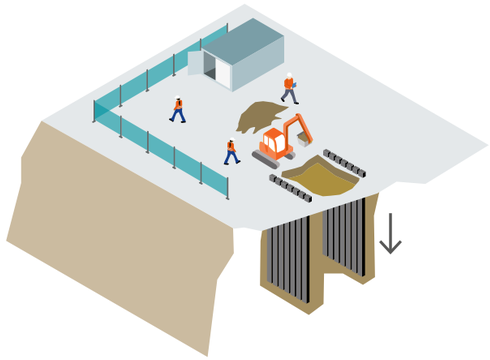
2 Demolish existing buildings and divert utilities



3 Install support piles



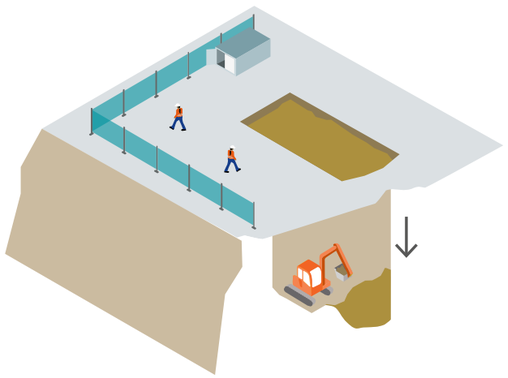
4 Begin initial excavation



Cut-and-cover construction

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

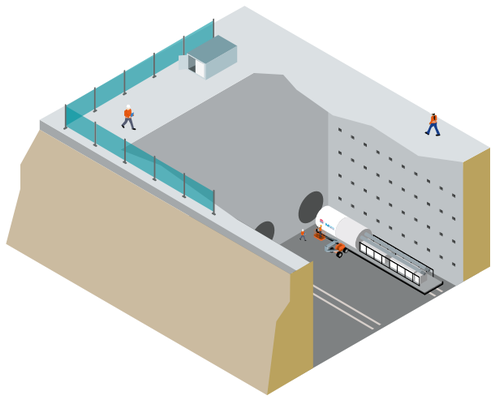
5 Excavate the station box



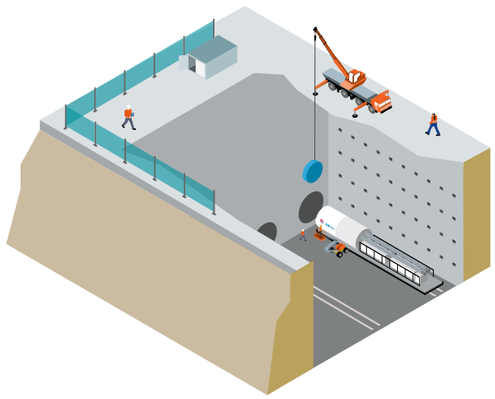
Tunnelling

Westmead, The Bays

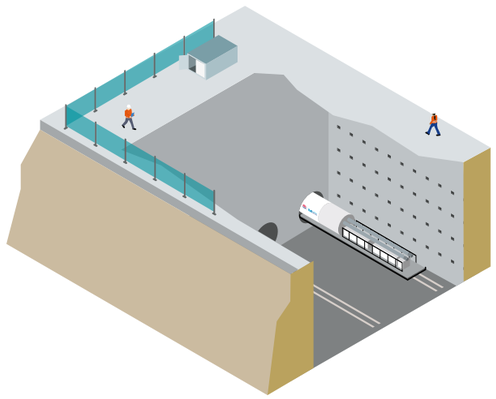
6 Build the TBM inside the excavated station box



7 Lift the cutter head into place

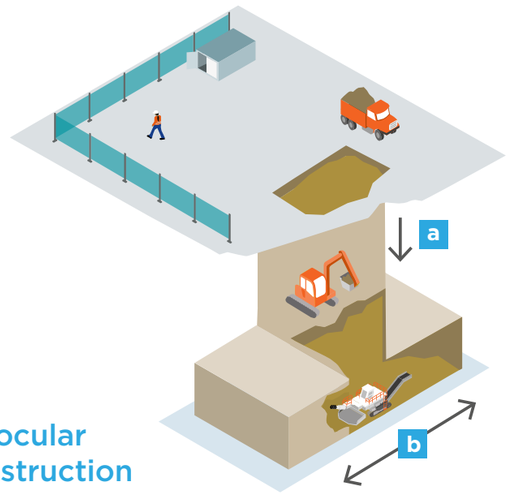


8 Tunnelling starts



Binocular construction

Five Dock

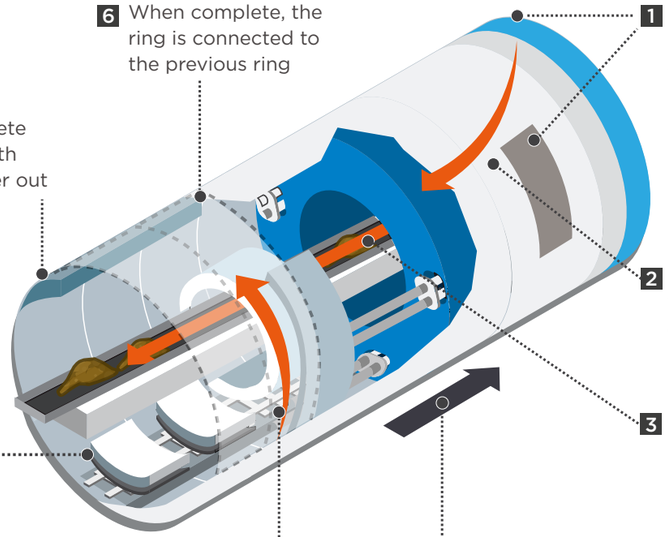


5

a. Excavate the station box

b. Excavate the caverns leading to the station platforms on either side with roadheaders and other equipment

How a tunnel boring machine works



6 When complete, the ring is connected to the previous ring

1 Grippers extend out to the rock surface. Rock is crushed by high strength alloy steel discs on the cutterhead

7 The gap between the concrete ring and the rock is filled with grout – this helps keep water out of the tunnel

2 Crushed rock is scooped into the machine's head and onto a conveyor belt

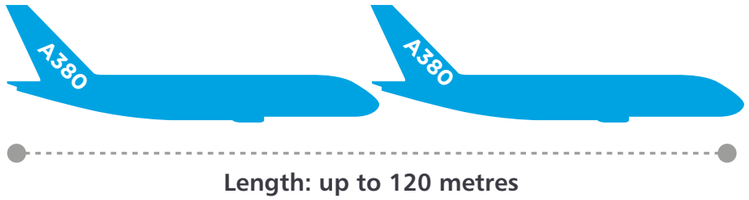
4 Concrete ring segments are delivered to the ring building area

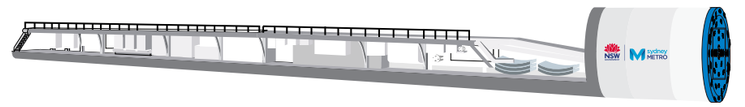
3 Conveyor moves rock through the machine and out of the tunnel behind it

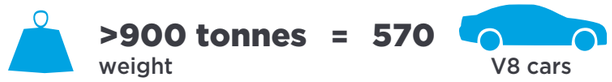
5 Concrete ring is built by putting together the segments using a special vacuum lifting device

8 The machine moves forward about 1.7 metres, then the process starts again

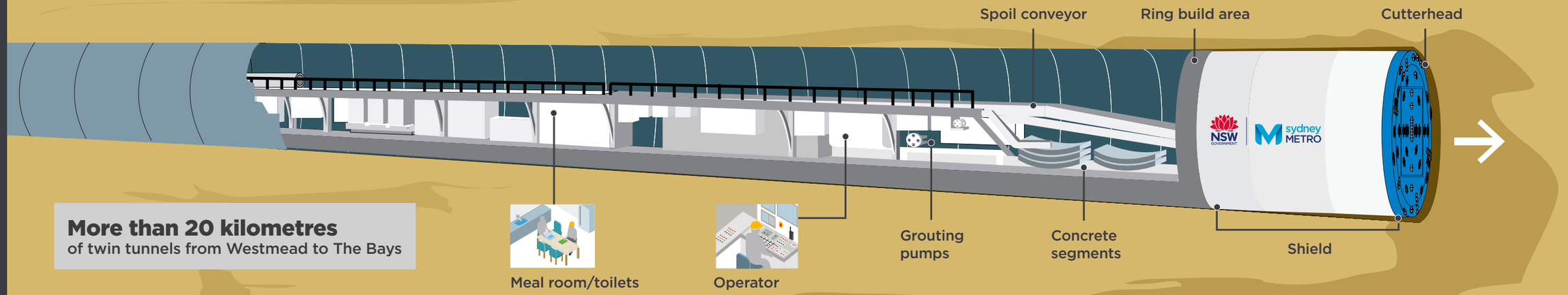
How does a TBM measure up?







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



More than 20 kilometres
of twin tunnels from Westmead to The Bays

Surface level

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

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

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

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.

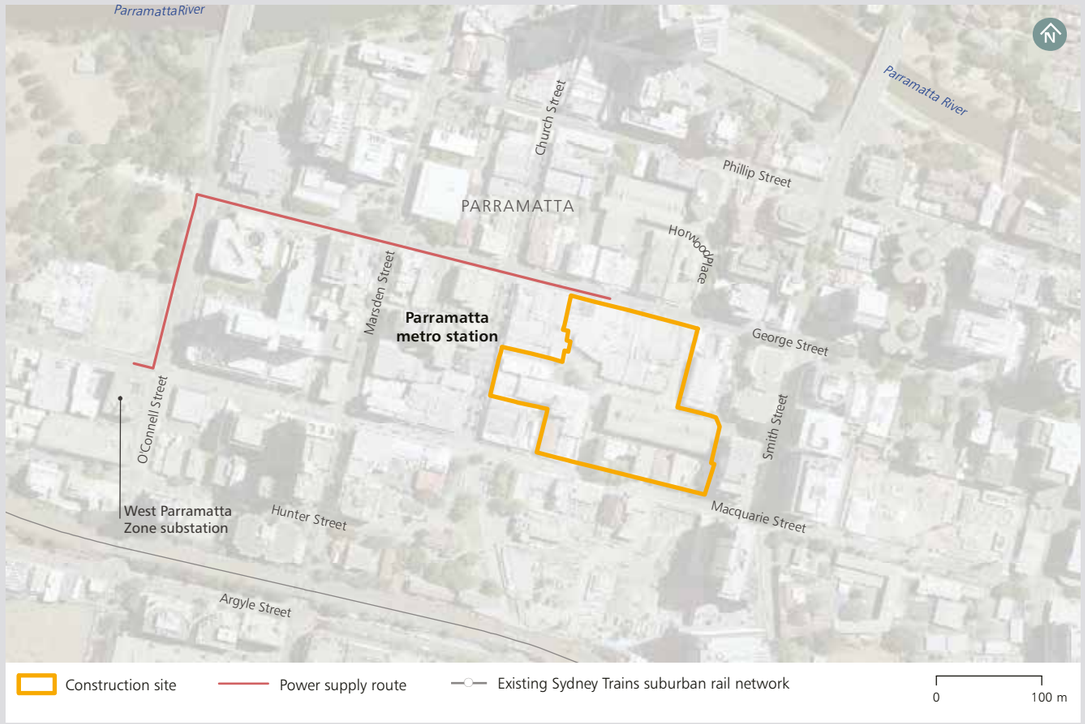
Indicative power supply routes

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



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

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

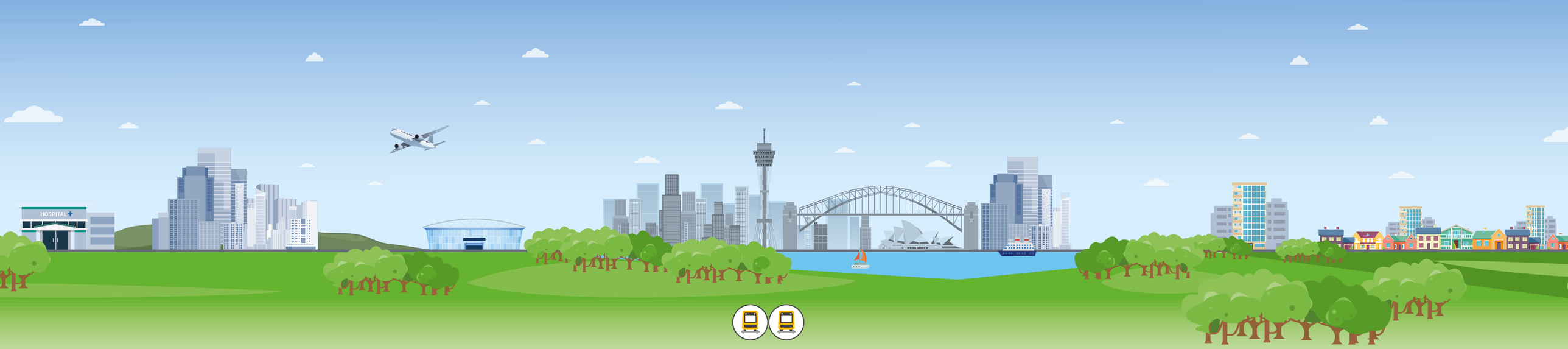
Crossover caverns would also be required to allow trains to pass from one track to another. Crossover caverns are important for the safety and reliability of the metro line, enabling trains to move from one tunnel to another in the case of a disruption, ensuring trains can keep moving. The appropriate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



Less than 1 storey
City Circle
York Street/Wynyard rail tunnel

7 storeys
Cross City Tunnel
Outside Town Hall

8 storeys
Sydney Harbour Tunnel
Average depth

8 storeys
Lane Cove Tunnel
Average depth

9 storeys
Metro North West Line
Average depth

11 storeys
Eastern Distributor
Average depth

12 storeys
WestConnex (New M5)
Average depth

12 storeys
M4-M5 Link
Rozelle Interchange
Average depth

12 storeys
Sydney Metro City & Southwest (Chatswood to Sydenham)
Average depth

13 storeys
Sydney Metro West
Average depth

25 storeys
Western Harbour Tunnel
Maximum depth

30 storeys
NorthConnex
Maximum depth

*Approximate measurements only

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.


coateshire
13 15 52

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.

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

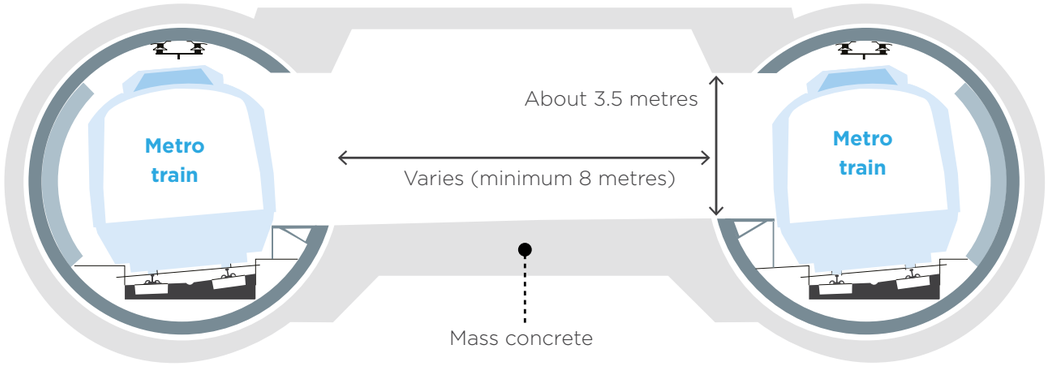

SANDVIK

Tunnel equipment and services

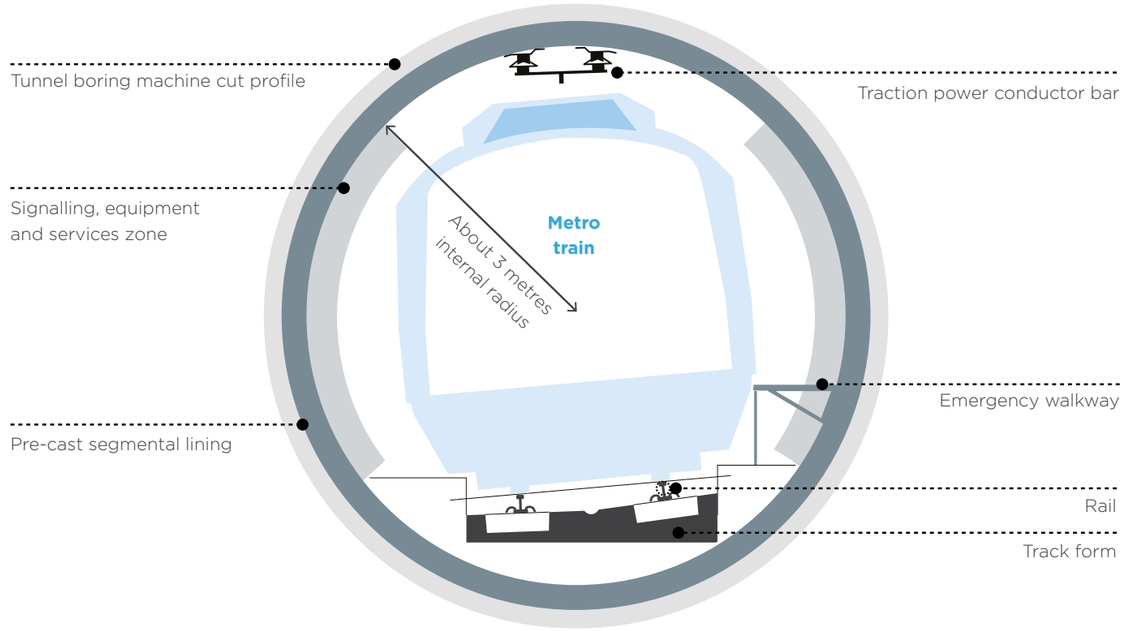
The tunnels would be fitted with rail signalling, controls and communication, overhead traction power, fresh air ventilation, fire and life safety systems, and lighting. Drainage would be incorporated into the concrete slab under the railway tracks and wastewater from the tunnels, stations and other 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.


NORTH STRATHFIELD
T
M

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 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

We are here

Concept

The Sydney Metro West Project Concept

Stage 1

Station excavation and tunnelling – Westmead to The Bays

Future applications

Stage 2

Future works Westmead to The Bays

Stage 3

Future works The Bays to Sydney CBD

*Road relocation works at The Bays is planned to commence in 2020.

Artist's impression of Westmead metro station.


WESTMEAD
Platforms
Platforms
40
5705 ST

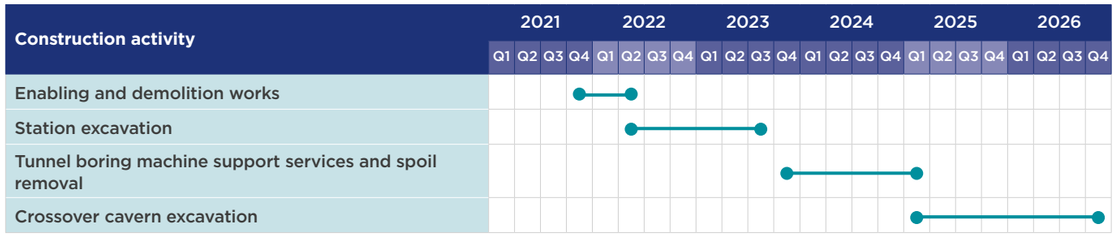
Westmead metro station and tunnel boring machine launch site

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*



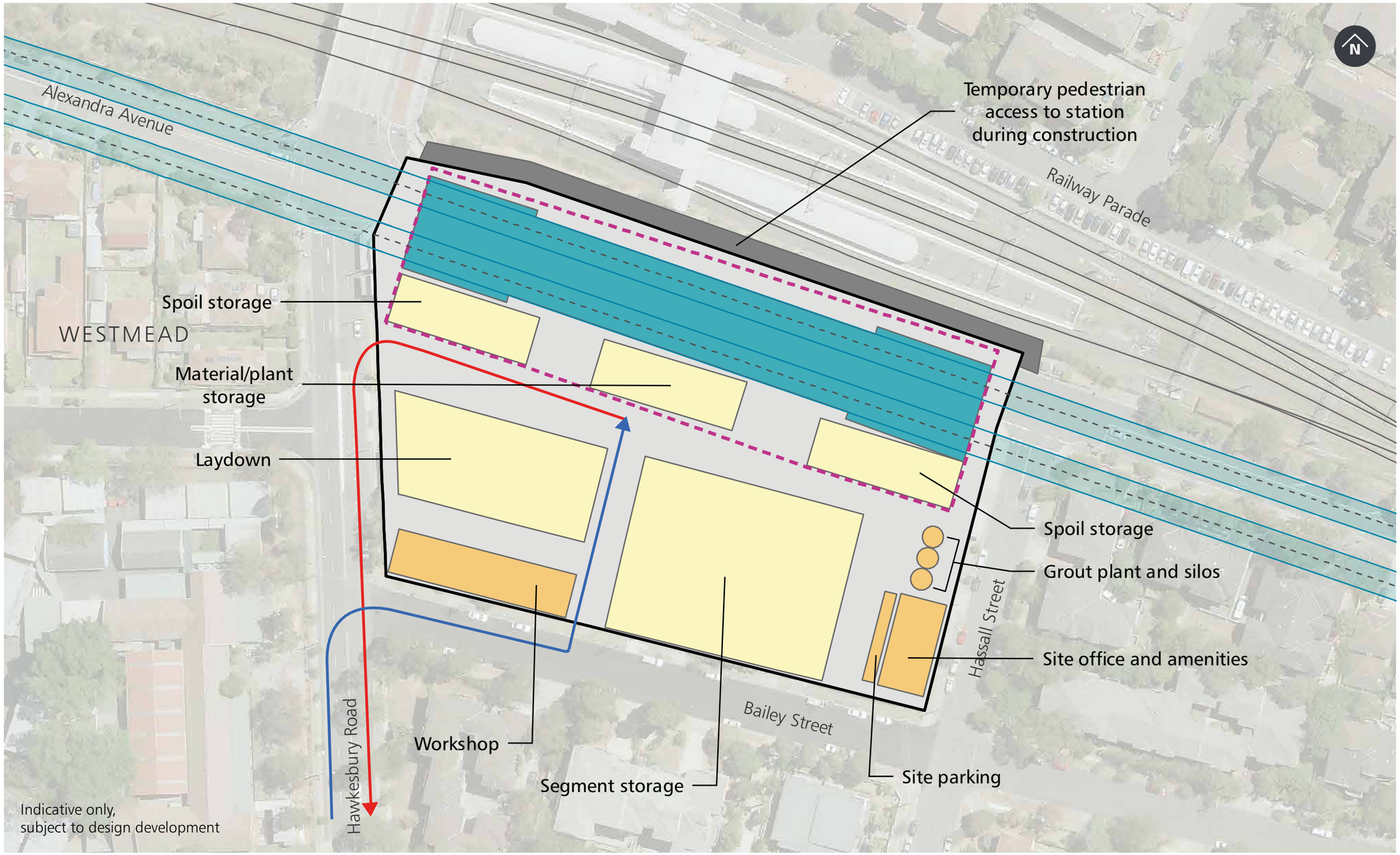
*Indicative construction timeframes for Stage 2 works would be subject to further design development and the environmental assessment process.

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 about 10 storeys **Excavating a turnback cavern and stub tunnels:** using a roadheader and/or rock hammers **Launching two TBMs:** 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	Excavator, Jackhammer, Compressor, Piling rig, Pumps, Conveyors, Mobile crane, Bulldozer, Dust scrubber, Ventilation fan, Front end loader, Shotcrete robot, Diesel generator, Concrete cutter, Portal crane, Rock breaker, Roadheader, Jumbo drill rig, Crawler crane, Air track drill, Concrete pump, Water treatment, Mobile elevated platforms, Sub-surface concrete truck, Articulated dump truck, Concrete boom pump, Tunnel boring machines
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 Street and Bailey Street** – 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
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.

Closure of the City Centre Car Park on Horwood Place is consistent with plans for the future vision of Parramatta including the proposed Civic Link. Closure of the car park was identified in the City of Parramatta Council's draft Parramatta CBD Public Car Parking Strategy in 2017.

Indicative construction timeframe for Stage 1 works*

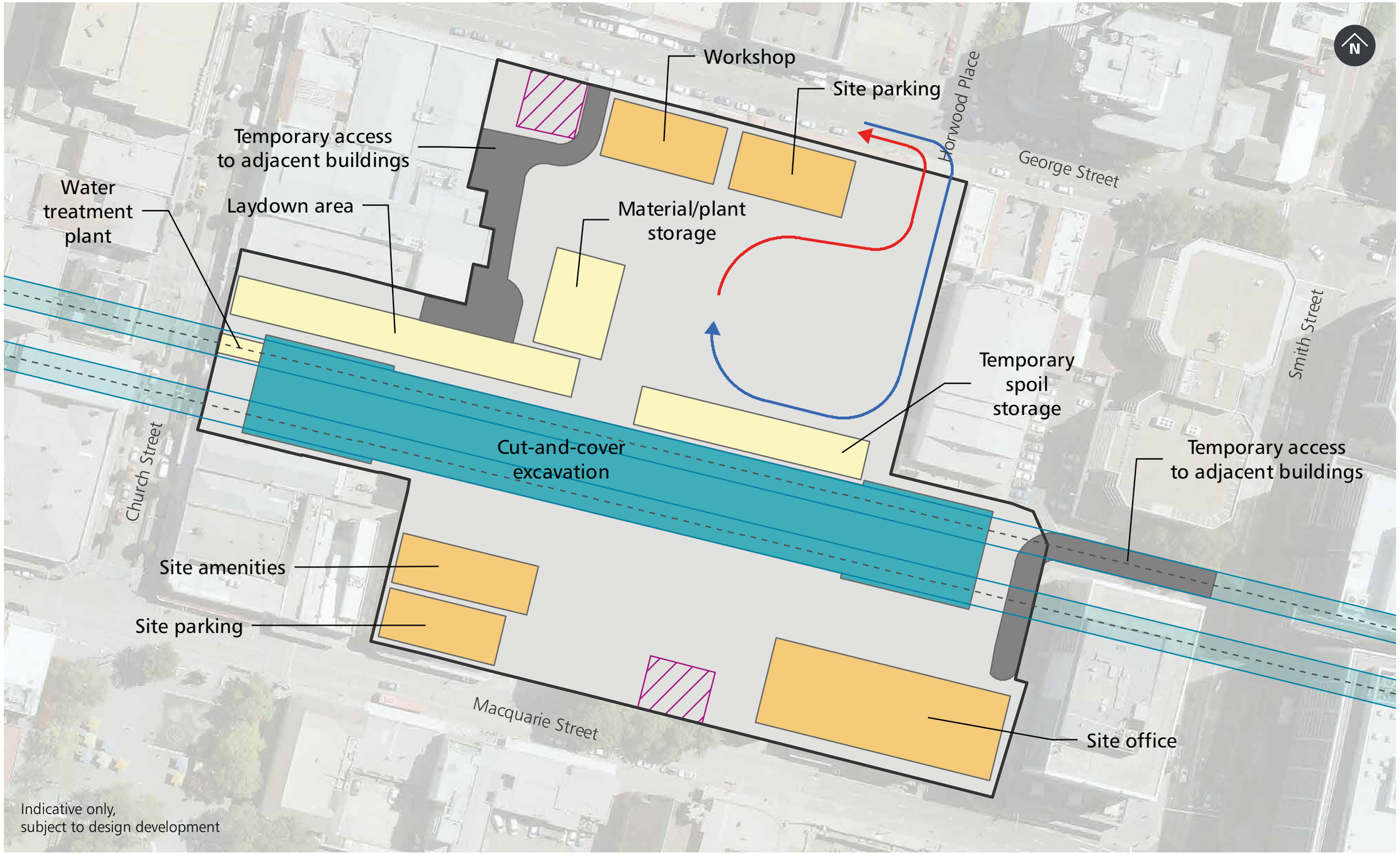
Construction activity	2021				2022				2023			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Enabling and demolition works				●	●							
Station box excavation						●	●	●	●	●	●	

*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
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 about 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	Pumps Excavator Jackhammer Conveyors Compressor Mobile crane Piling rig Bulldozer Crawler crane Air track drill Rock breaker Dust scrubber Ventilation fan Front end loader Water treatment Shotcrete robot Concrete cutter Diesel generator Concrete boom pump Mobile elevated platforms Articulated dump truck
Proposed public transport changes	No changes
Proposed street parking changes	Parking will need to be removed to facilitate construction of the new station. Permanent changes would include: **City Centre Car Park** – removal of around 800 off-street car parking spaces accessible from Horwood Place. This would be consistent with Parramatta Council's draft Parramatta CBD Public Car Parking Strategy in 2017, which includes measures to offset loss of parking spaces **Horwood Place** – removal of around 35 on-street parking spaces
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

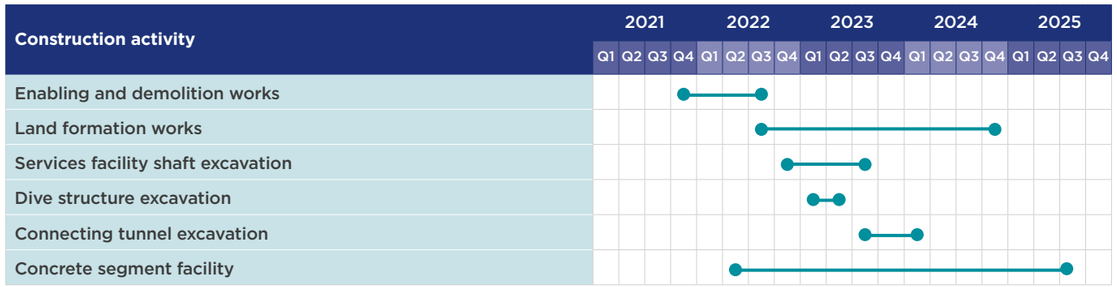


Clyde stabling and maintenance facility

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*

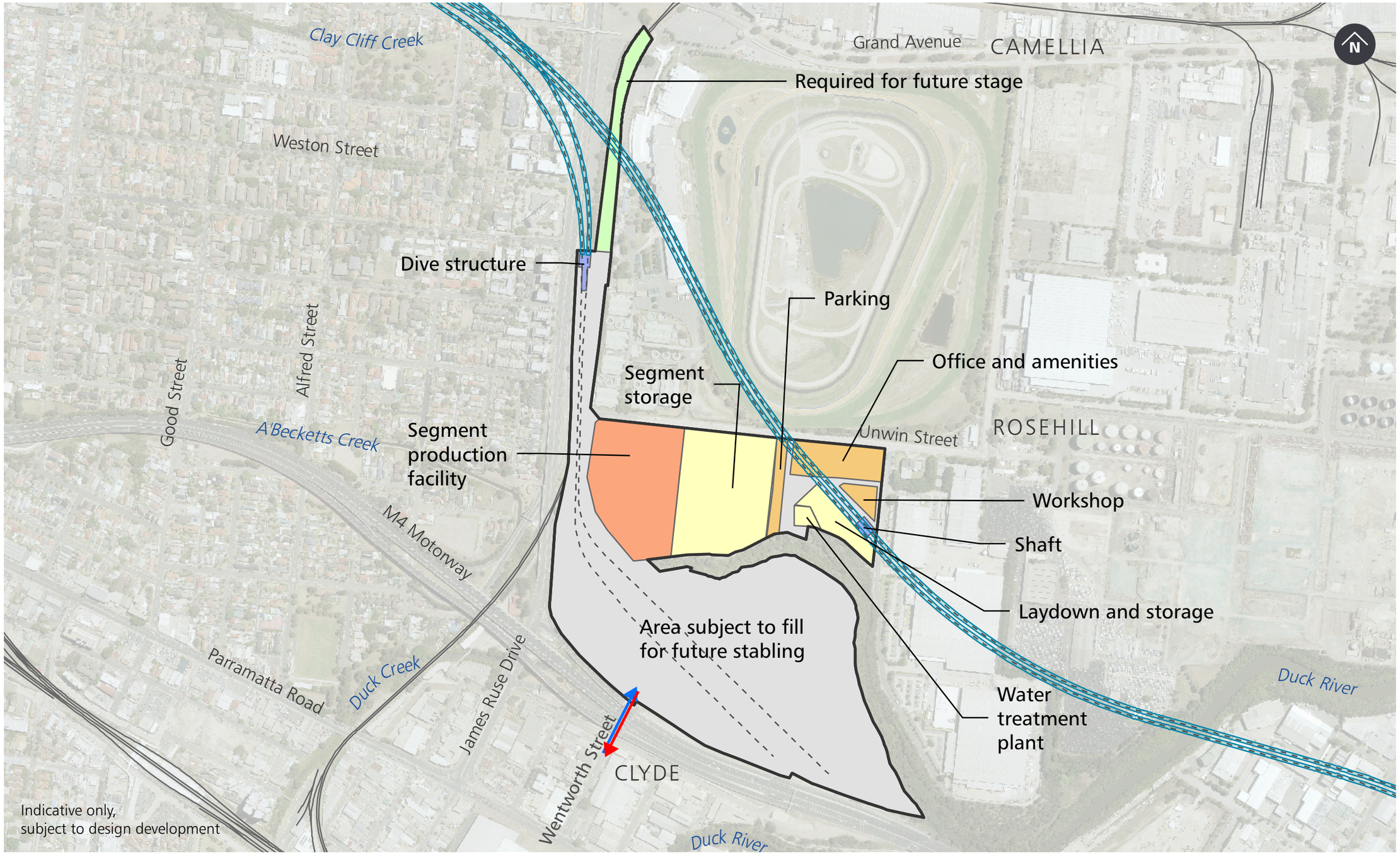


*Indicative construction timeframes for Stage 2 works would be subject to further design development and the environmental assessment process.

Construction at a glance

Feature	Description
Size	380,000 square metres (m^2)
Site access	**Wentworth Street** to Parramatta Road
Proposed construction hours	**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 **Tunnelling:** 24 hours a day **Pre-cast facility operation:** 24 hours a day **Spoil delivery:** 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:** 352 trucks per day and 310 light vehicles per day **Excavation and importing spoil:** 1056 trucks per day and 496 light vehicles per day Haulage routes would minimise the use of local and residential streets where possible
Proposed demolition	50 buildings
Indicative heritage impacts	The proposal would require the removal of approximately 0.7 hectares of heritage wetlands A heritage listed former Roads & Transport Authority (RTA) depot would be located within the construction site and would be protected during construction 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
Proposed landscape changes	Trees and mangroves (riparian vegetation) would be removed within the identified construction site 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
Proposed excavation	Shaft excavation (services facility) and dive structure excavation
Indicative spoil removal	**Services facility shaft:** 20,000 cubic metres (m^3) **Dive structure:** 90,000 cubic metres (m^3) **Connecting tunnels:** 85,000 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 **Land formation works** – to prepare the site for the stabling and maintenance facility **Building a bridge** – over A'Becketts Creek and Duck Creek, including creek realignment works **Building a pre-cast concrete segment facility** – to make the concrete segments for the inside of the tunnels **Excavating a shaft** – for a services facility **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
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 Rosehill zone transmission substation
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	Pumps, Scraper, Grader, Excavator, Conveyors, Bulldozer, Roadheader, Backhoe, Ventilation fan Shotcrete robot, Dust scrubber, Compactor, Jackhammer, Compressor, Piling rig, Concrete cutter, Diesel generator, Mobile crane Concrete pump, Portal crane, Rock breaker, Vibratory roller, Steel drum roller, Ballast tamper, Water treatment, Front end loader, Jumbo drill rig Concrete boom pump, Mobile elevated platforms, Sub-surface concrete truck, Articulated dump truck, Vibratory pile driver, Crawler crane, Front-end loader, Air track drill
Proposed public transport changes	No changes
Proposed street parking changes	Temporary removal of on-street parking spaces to allow trucks to enter and exit the site safely **Unwin and Wentworth streets** – up to 10 on-street parking spaces
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. Pedestrians would be advised to use the northern side of the road
Other projects and plans in the local area	Parramatta Light Rail – Stage 1 Clyde Terminal Conversion Project

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*

Construction activity	2021				2022				2023			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Enabling and demolition works				●								
Services facility shaft excavation				●	―	●						

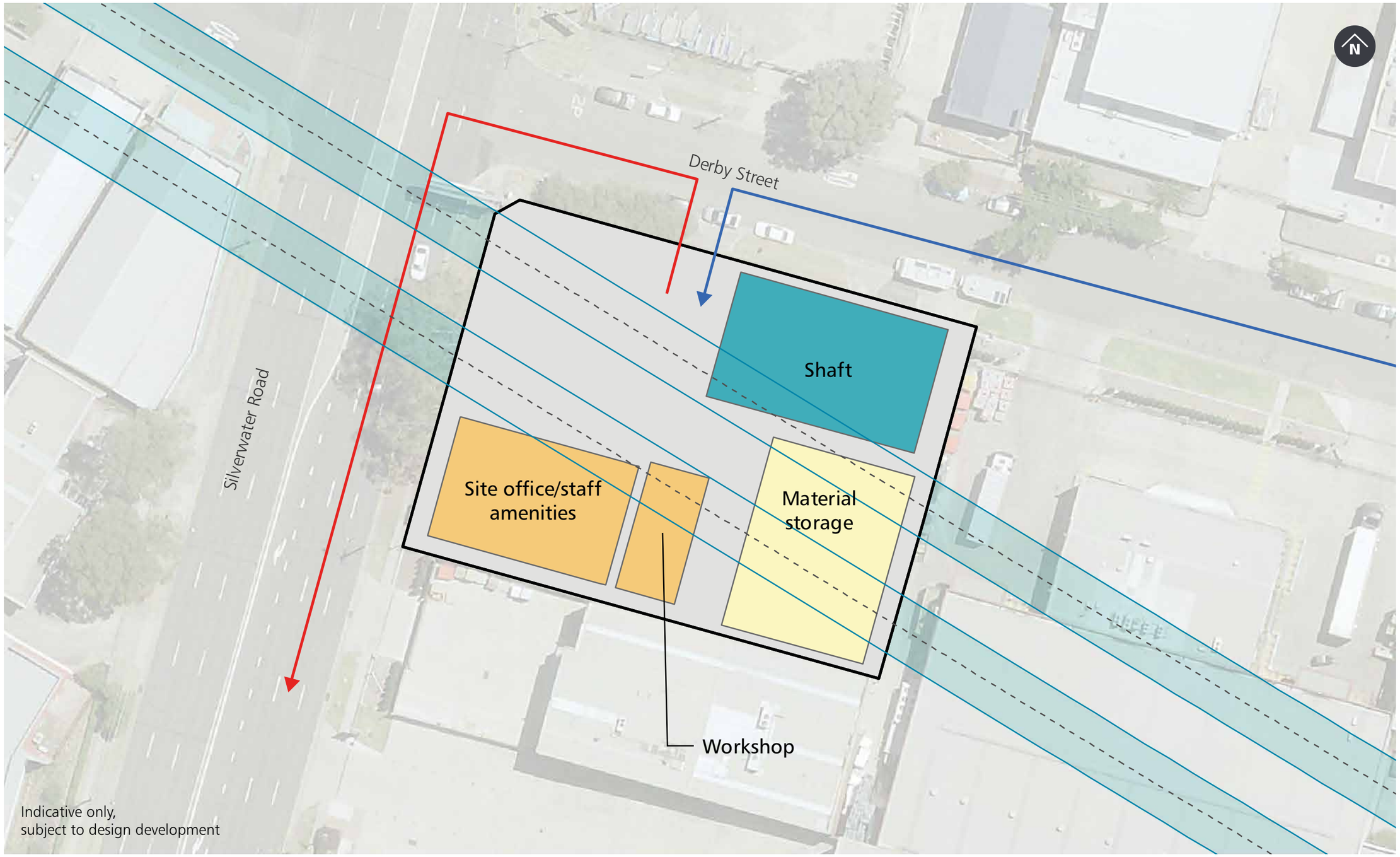
*Indicative construction timeframes for Stage 2 works would be subject to further design development and the environmental assessment process.

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 **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	Pumps Excavator Jackhammer Diesel generator Compressor Mobile crane Piling rig Portal crane Bulldozer	Concrete cutter Jumbo drill rig Front end loader Crawler crane Conveyors Air track drill Rock breaker Water treatment Concrete pump	Shotcrete robot Dust scrubber Ventilation fan Mobile elevated platforms Sub-surface concrete truck Articulated dump truck Concrete boom pump
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



Sydney Olympic Park metro station and tunnel boring machine retrieval site

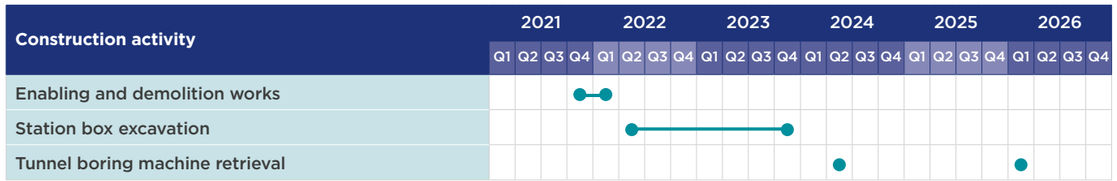
The proposed Sydney Olympic Park metro station would be located to the south of the existing Sydney Trains Olympic Park Station.

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 Elliot Avenue and Figtree Drive, and off Dawn Fraser Avenue.

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

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*

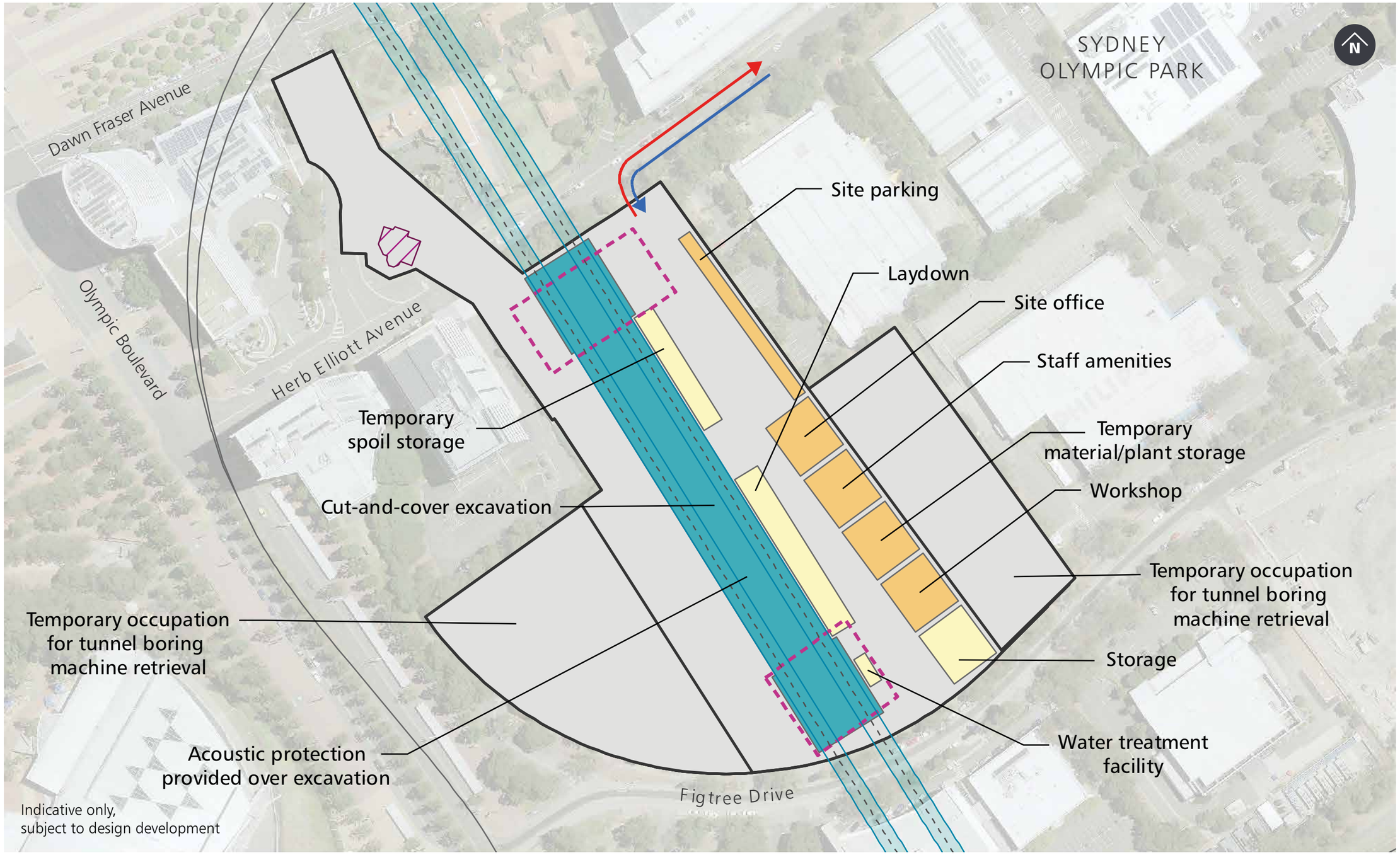


*Indicative construction timeframes for Stage 2 works would be subject to further design development and the environmental assessment process.

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:** Monday to Friday 7am–6pm and Saturday 8am–1pm, occasional, short-term night work may be required **Demolition:** Monday to Friday 7am–6pm and Saturday 8am–1pm **Excavation:** 24 hours a day **TBM 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
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 approximately eight storeys **Retrieving four TBMs** 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 Elliot Avenue
Proposed traffic changes	**Temporary changes:** **Herb Elliot 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	Excavator Jackhammer Compressor Mobile crane Piling rig Pumps Conveyors Bulldozer Crawler crane Front end loader Water treatment Diesel generator Concrete cutter Air track drill Shotcrete robot Dust scrubber Ventilation fan Jumbo drill rig Concrete pump Portal crane Rock breaker Tunnel boring machines (retrieval) Sub-surface concrete truck Mobile elevated platforms Articulated dump truck Concrete boom pump
Proposed public transport changes	**Herb Elliot 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*

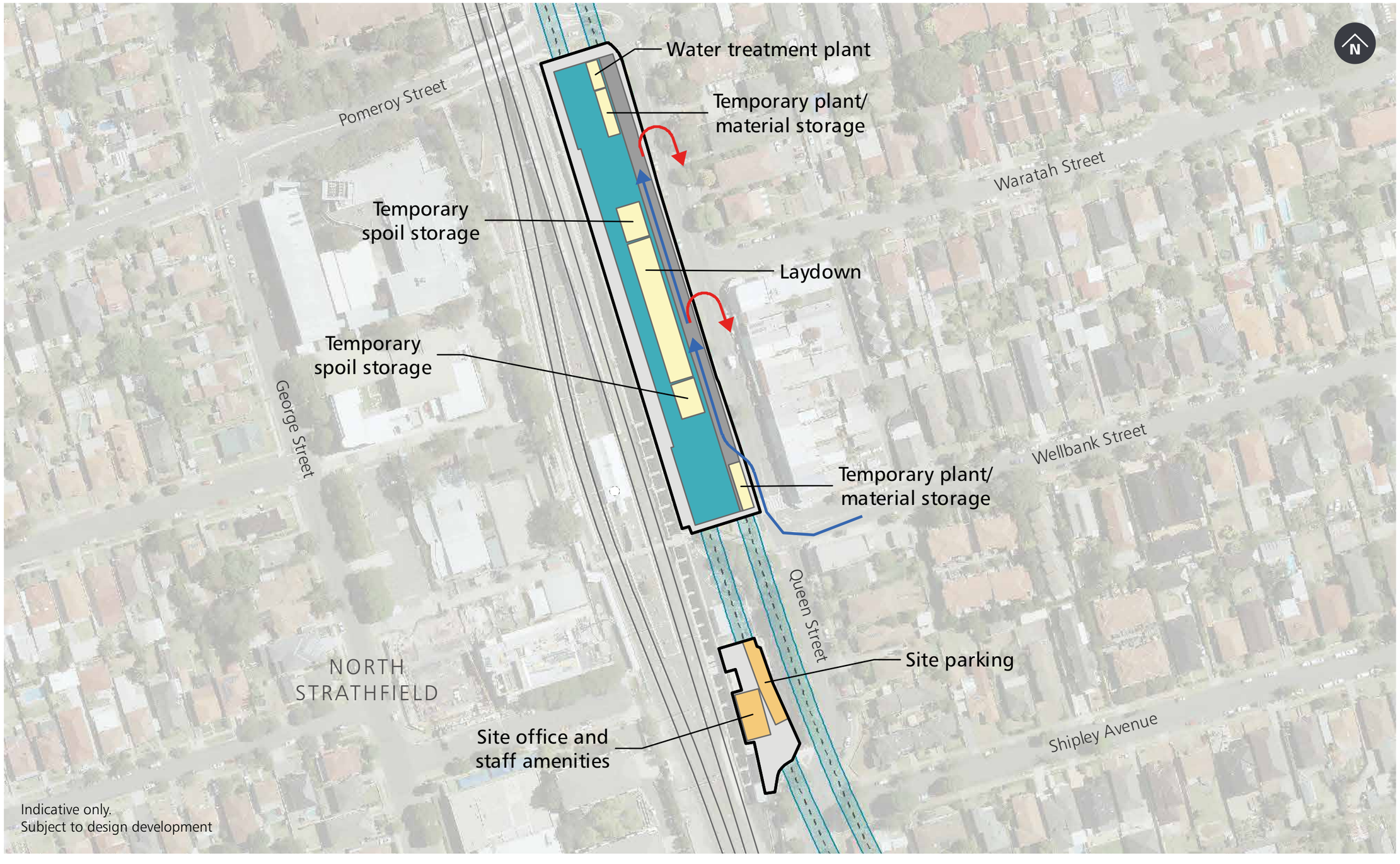
Construction activity	2021				2022				2023			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Enabling and demolition works					●							
Station excavation						●	—	—	—	●		

*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 **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)
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 approximately six 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	Pumps Excavator Jackhammer Bulldozer Conveyors Compressor Mobile crane Water treatment Concrete cutter Piling rig Crawler crane Dust scrubber Rock breaker Air track drill Shotcrete robot Ventilation fan Diesel generator Mobile elevated platforms Articulated dump truck Concrete boom pump 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



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 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*

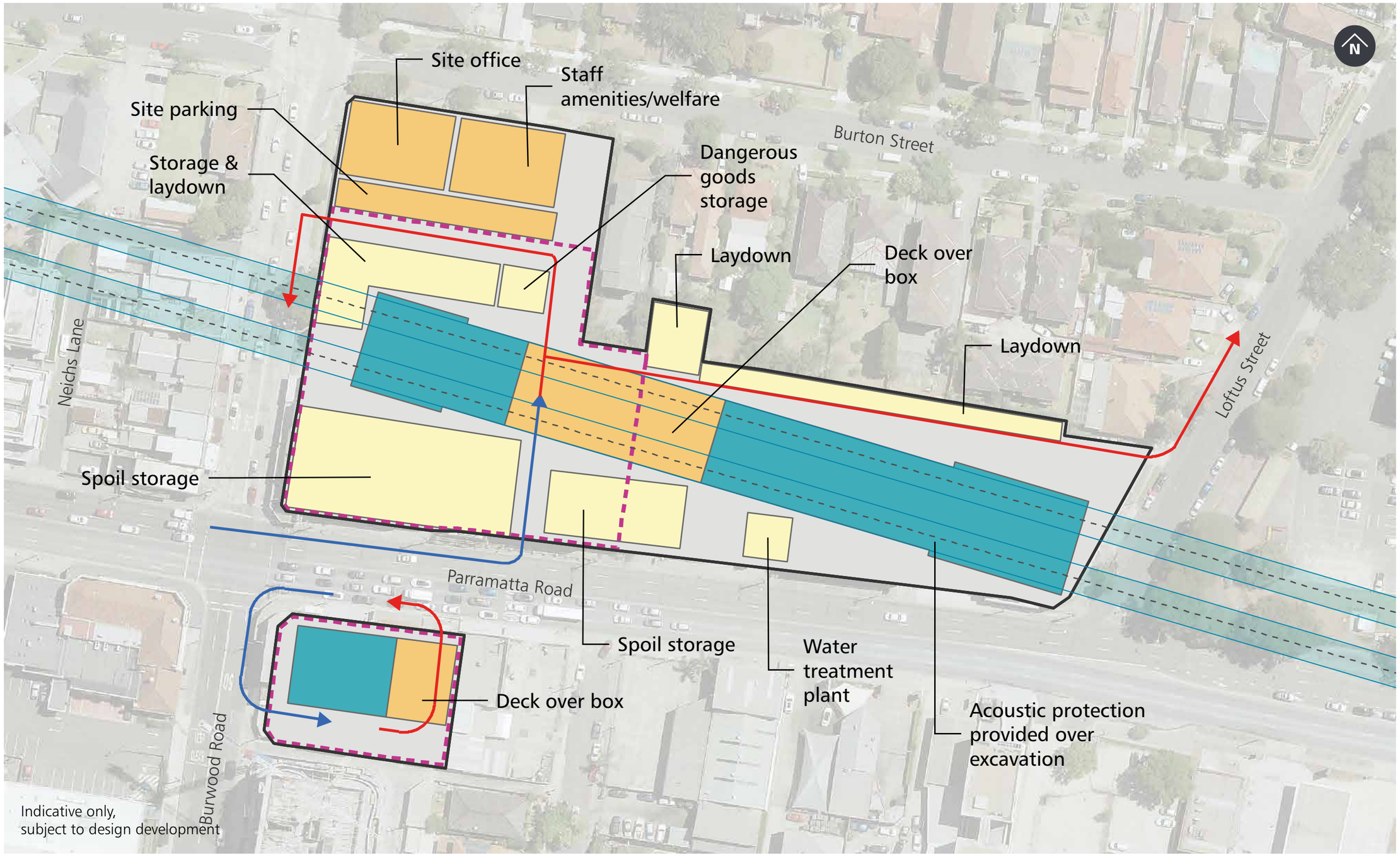
Construction activity	2021				2022				2023				2024			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Enabling and demolition works				●	●											
Station excavation (including southern shaft and adit)						●	●	●	●	●	●	●				
Turnback cavern excavation								●	●	●	●	●	●	●	●	●

*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 **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
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 approximately eight 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	Pumps Excavator Bulldozer Conveyors Roadheader Jackhammer Compressor Mobile crane Piling rog Crawler crane Dust scrubber Water treatment Front end loader Diesel generator Concrete cutter Concrete pump Portal crane Rock breaker Jumbo drill rig Ventilation fan Air track drill Shotcrete robot Concrete boom pump Sub-surface concrete truck Mobile elevated platform Articulated dump truck
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

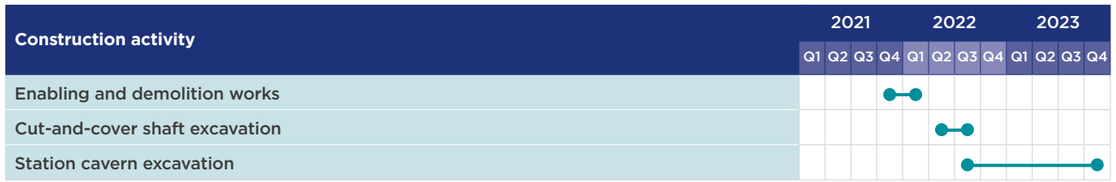


Five Dock Station

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*

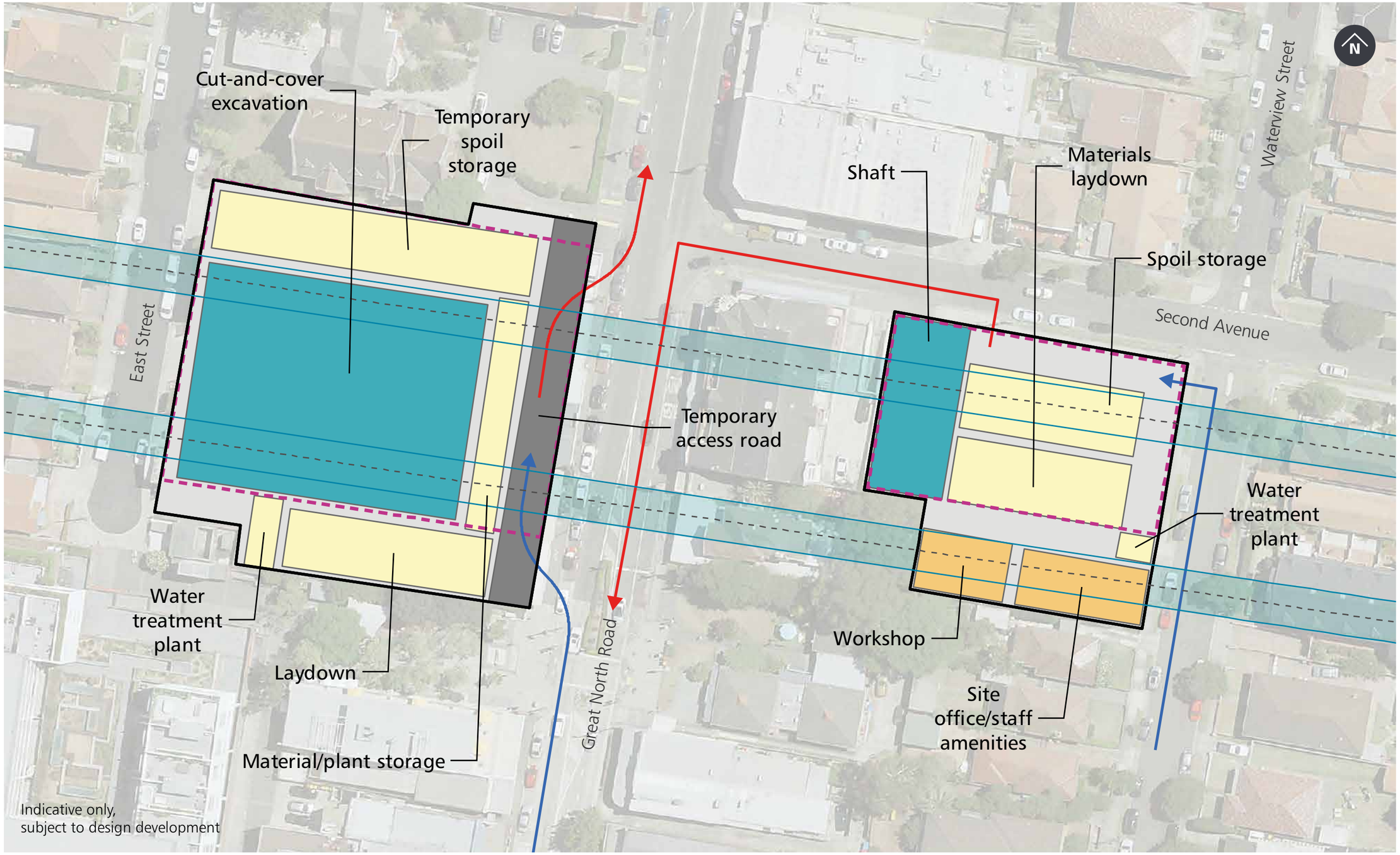


*Indicative construction timeframes for Stage 2 works would be subject to further design development and the environmental assessment process.

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
Proposed excavation	Binocular
Indicative spoil removal	**Excavation:** 165,000 cubic metres (m^3) of mostly sandstone
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 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	Pumps Excavator Conveyors Jackhammer Compressor Bulldozer Roadheader Piling rig Mobile crane Crawler crane Concrete cutter Concrete pump Portal crane Rock breaker Diesel generator Water treatment Air track drill Shotcrete robot Dust scrubber Ventilation fan Jumbo drill rig Concrete boom pump Front end loader Articulated dump truck Sub-surface concrete truck Mobile elevated platforms
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 **Second Avenue** – permanent removal of 12 off-street public parking spaces where the building is required to be demolished for the metro station
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

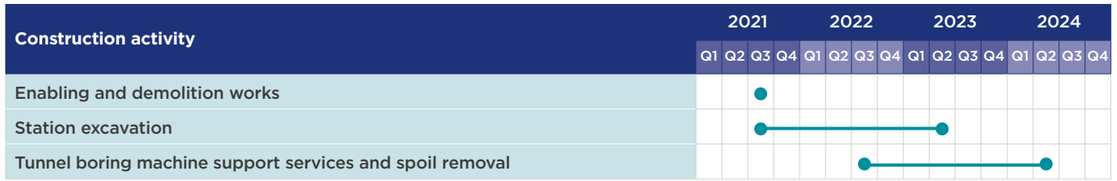
Construction site map



The Bays metro 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*

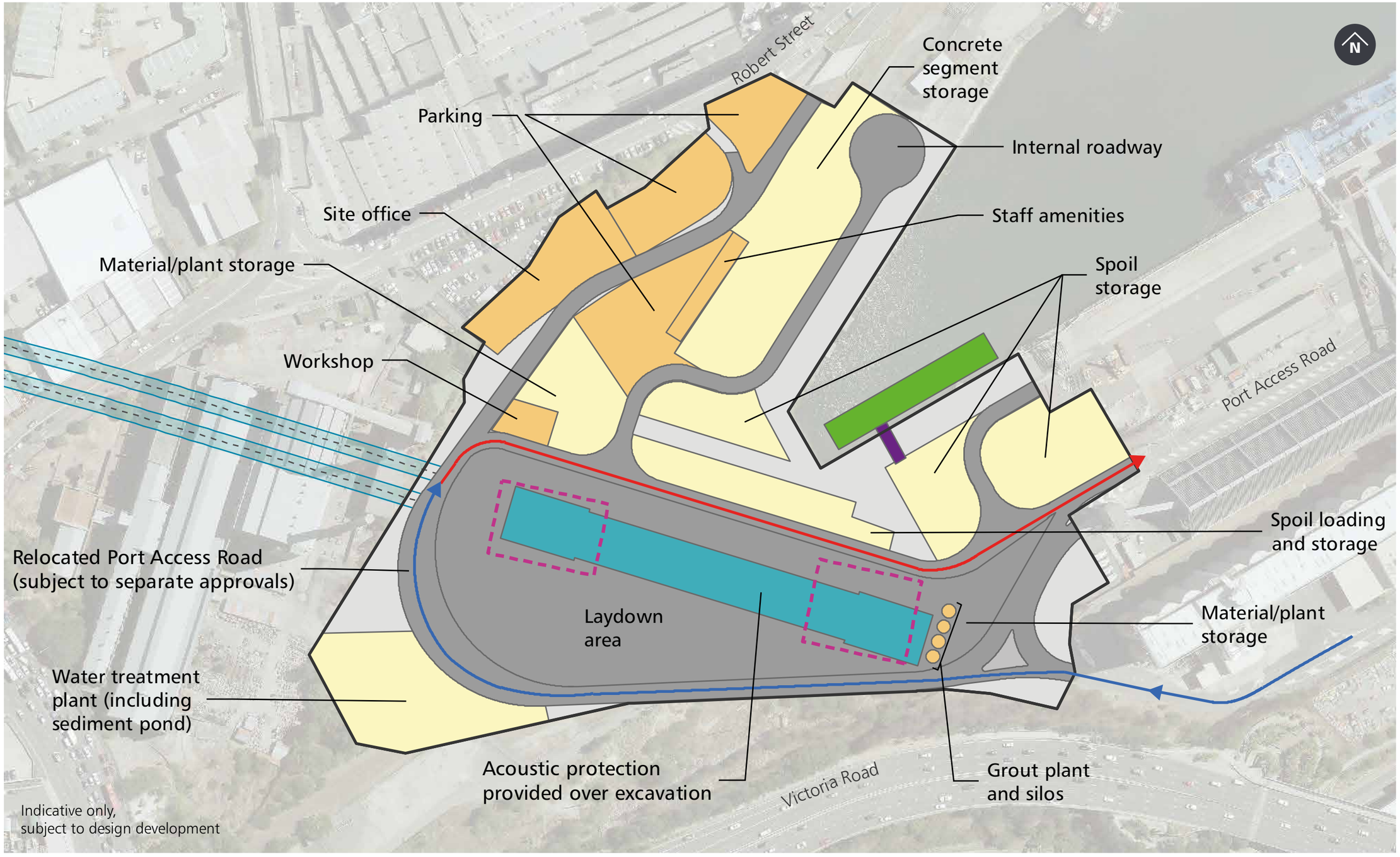


*Indicative construction timeframes for Stage 2 and Stage 3 works would be subject to further design development and the environmental assessment process.

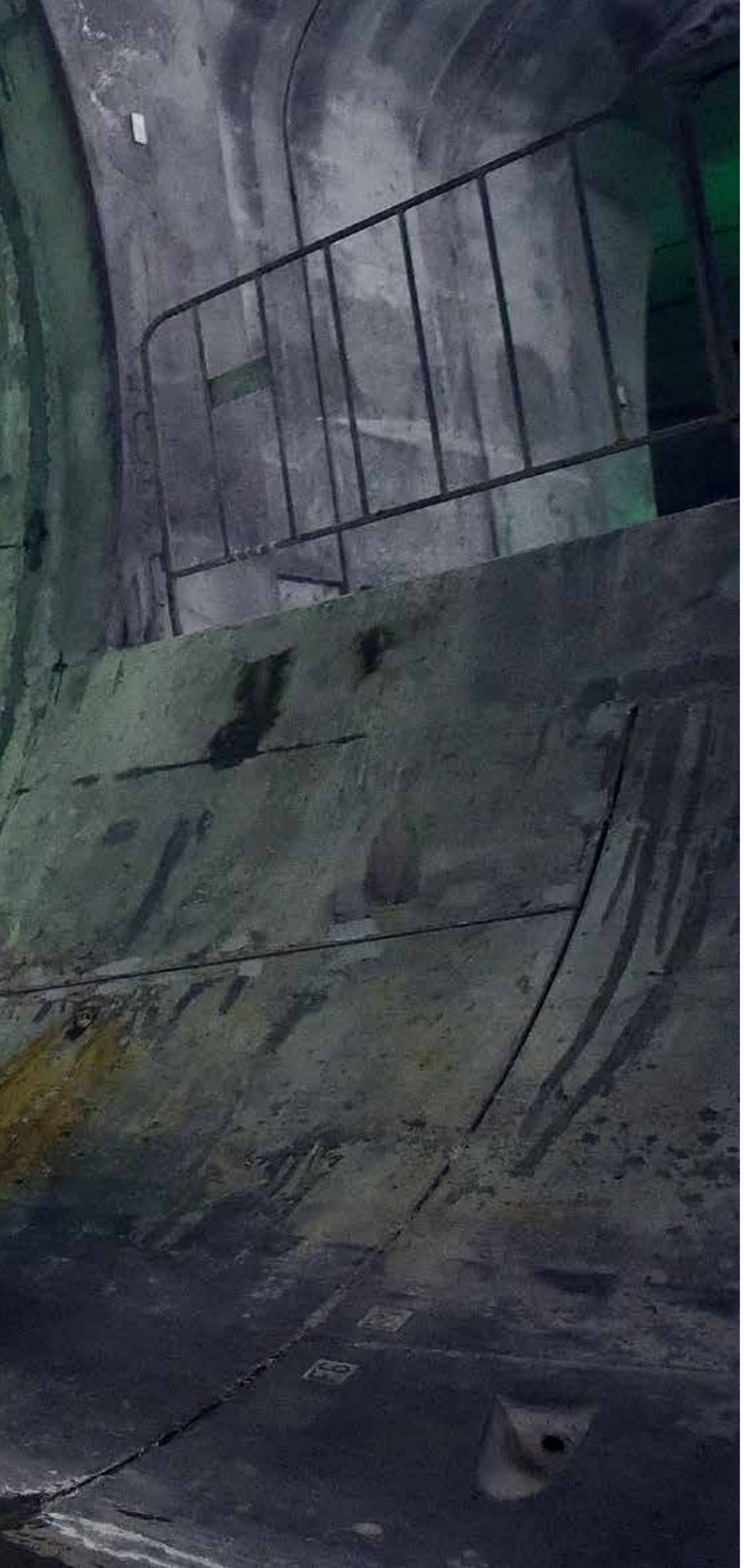
Construction at a glance

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
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 about 10 storeys **Launching two TBMs** 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 substation
Proposed traffic changes	**Port Access Road and Solomans Way** – realignment is proposed and is subject to a separate environmental approval process
Indicative utility works	Protection and/or relocation of existing power, communications, water, sewer and stormwater
Indicative plant and equipment	Pumps Excavator Bulldozer Conveyors Jackhammer Compressor Concrete pump Portal crane Flatbed trucks Access lift Piling rig Tele-handler Rock breaker Mobile crane Concrete cutter Crawler crane Diesel generator Water treatment Front end loader Air track drill Shotcrete robot Dust scrubber Ventilation fan Jumbo drill rig Concrete boom pump Articulated dump truck Mobile elevated platforms Sub-surface concrete truck
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 Program, including the Warringah Freeway Upgrade Glebe Island concrete batching plant and Multi-User Facility

Construction site map



Project corridor and tunnel alignment



Hills Showground Station tunnel.

Tunnel alignment and corridor

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 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.

Development applications 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 Sydney Metro West tunnel alignment

2020

1. **Proposed tunnel alignment is assessed as part of the Stage 1 EIS and corridor protection of 25 metres is put in place**

2021

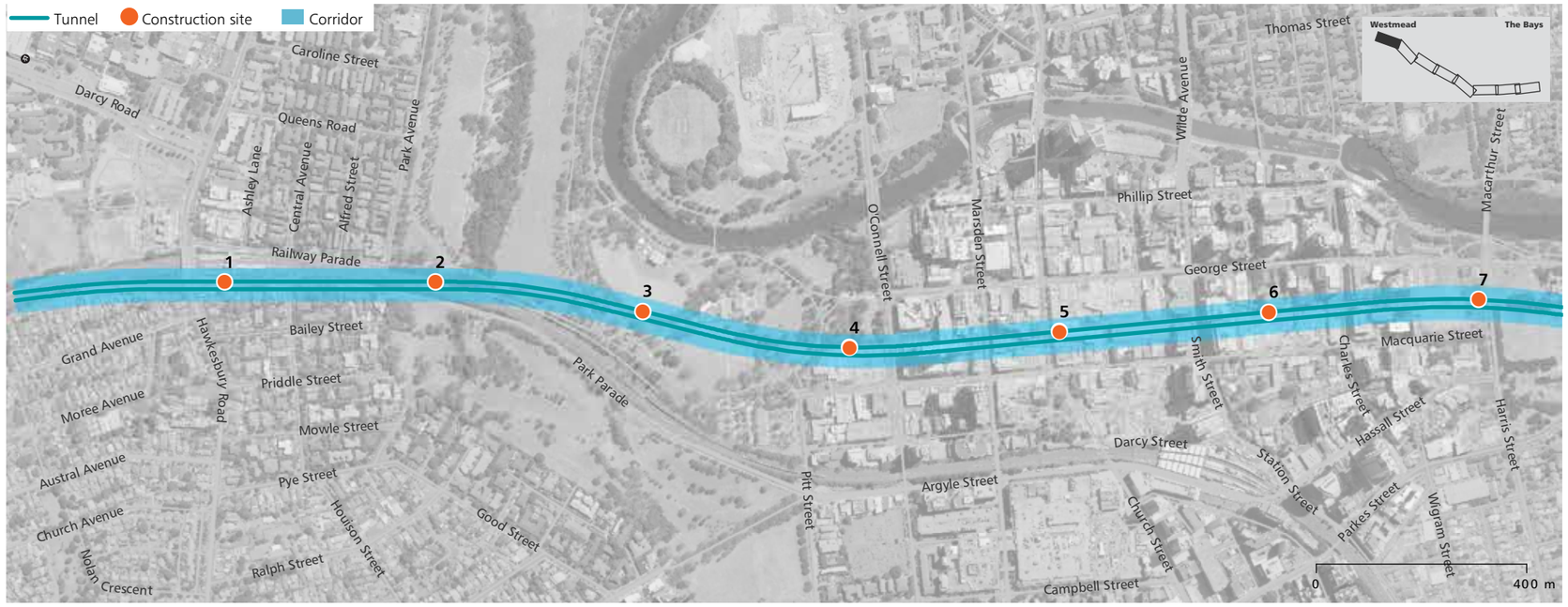
2. **Tunnel alignment is confirmed and property owners above the tunnel alignment are contacted by the project team**

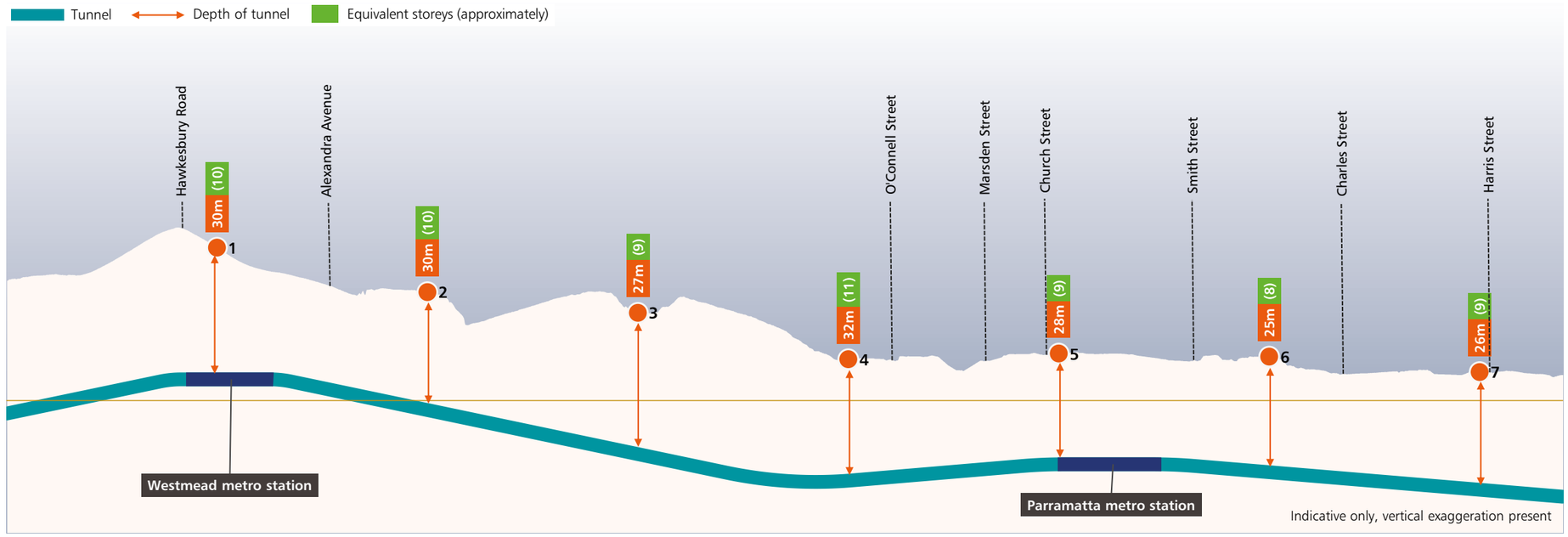
Cavern view of progress works on the Sydney Metro City & Southwest project.

How we choose the tunnel alignment

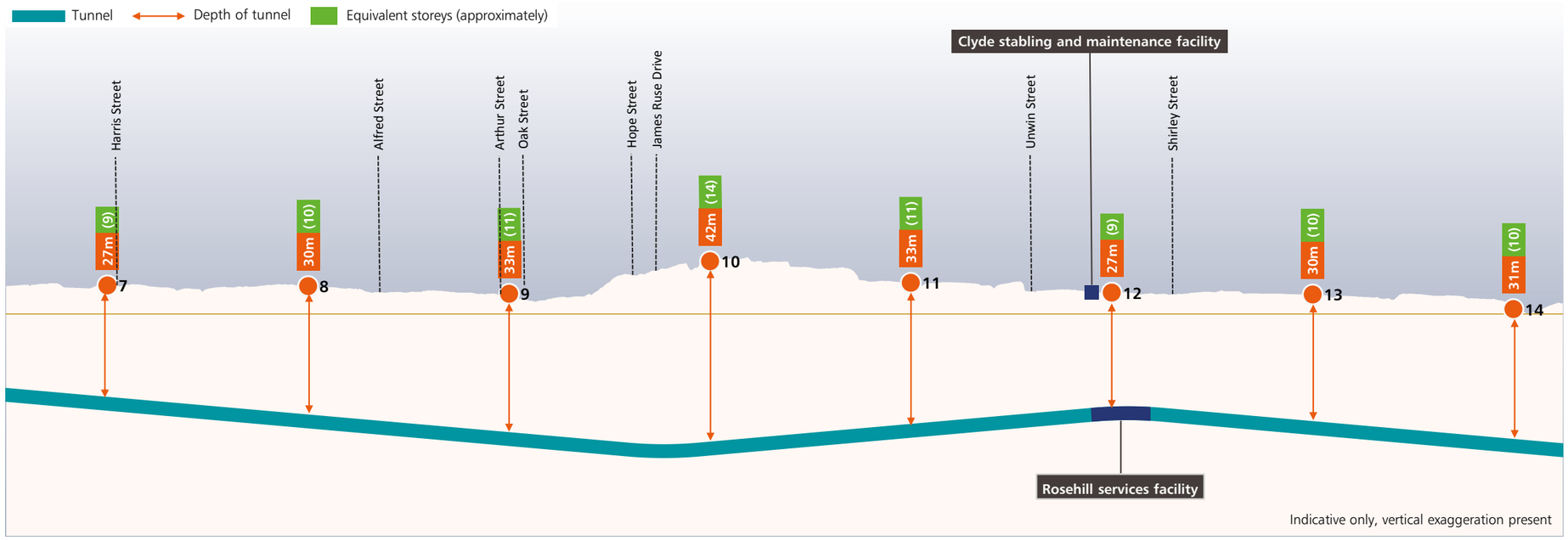
- The location, depth and structure of the stations
- Maintaining an appropriate vertical grade range and curve to allow for reliable train speed
- Underground rock and ground conditions
- Avoiding existing structures like building basements, heritage items, utilities and other tunnels

Westmead to Clyde tunnel and corridor alignment

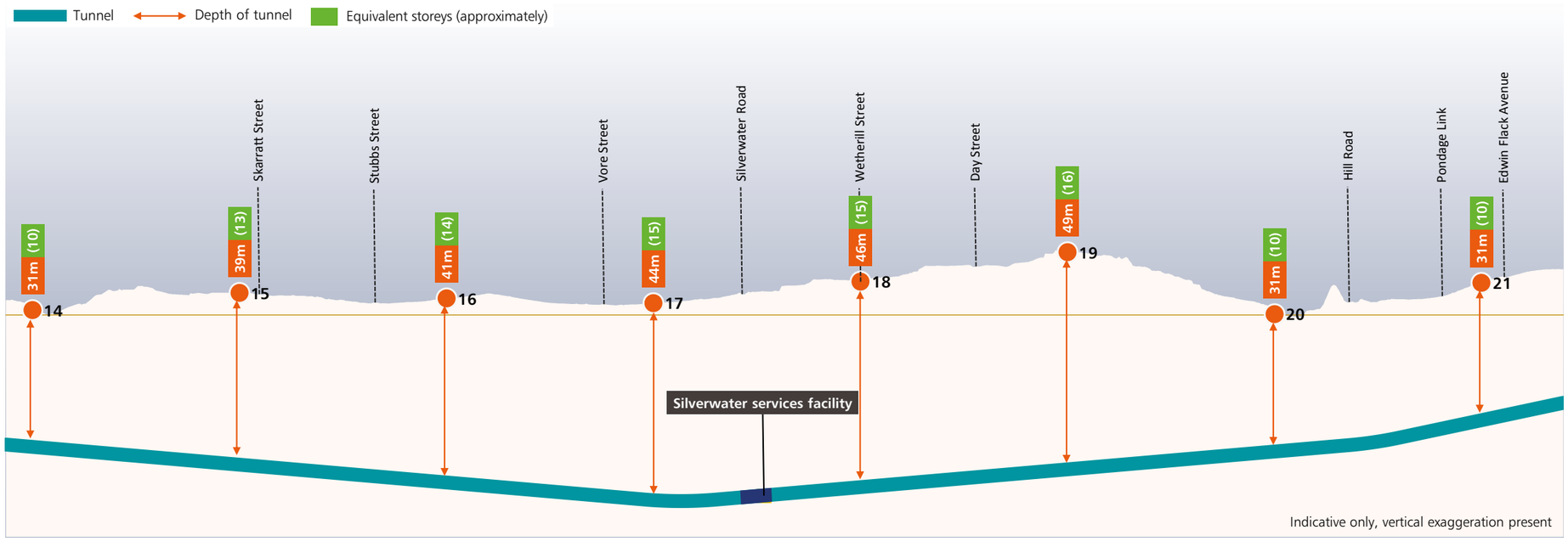


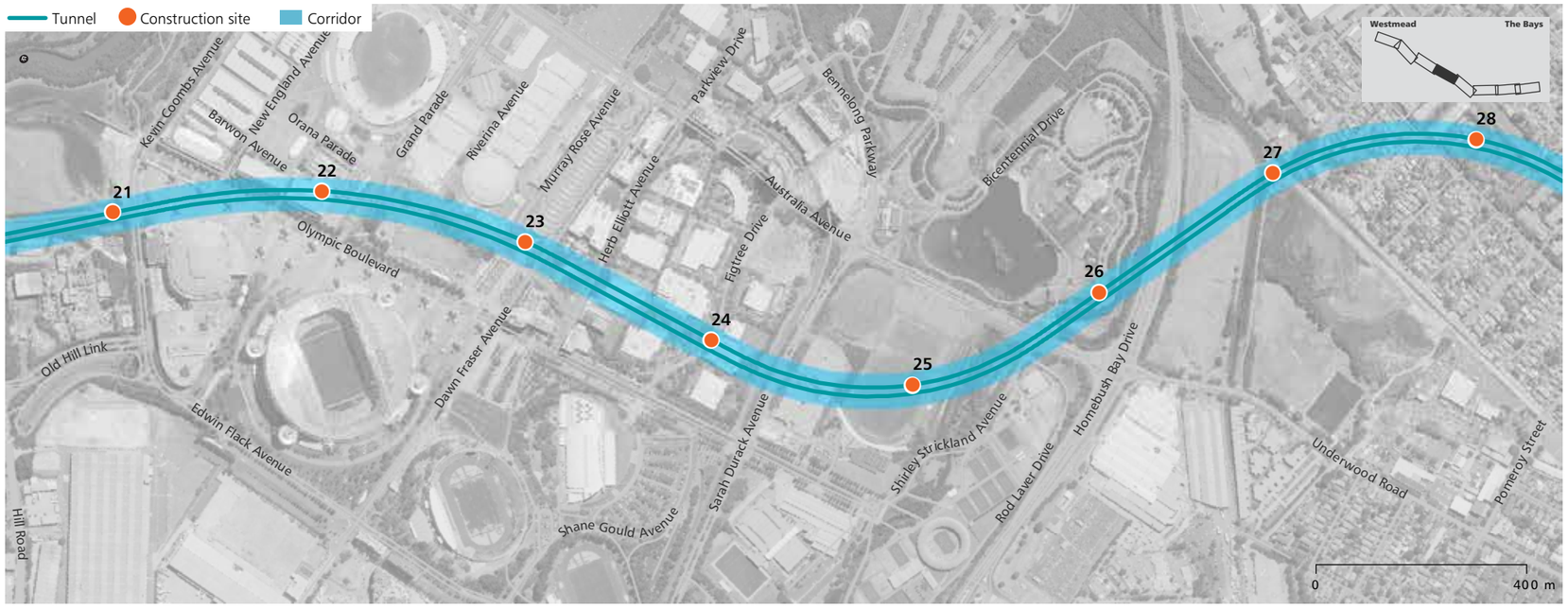


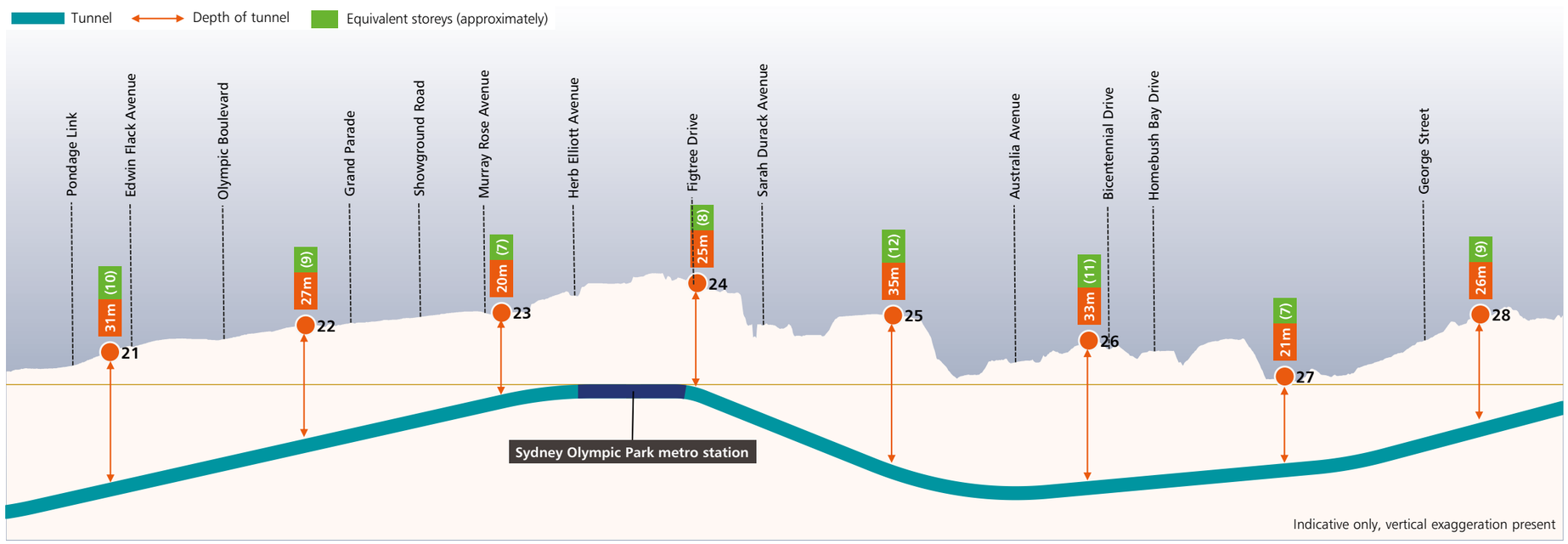

Tunnel
Construction site
Corridor
Westmead
The Bays
Macarthur Street
George Street
Noller Parade
River Road
Hassall Street
Oak Street
Arthur Street
James Ruse Drive
Penelope Lucas Lane
Prospect Street
Virginia Street
Alfred Street
Alice Street
Weston Street
Eleanor Street
Harris Street
Macquarie Street
Parkes Street
Wigram Street
Frank Beames Lane
Albion Street
Crown Street
Good Street
Unwin Street
Shirley Street
Tennyson Street
Western Motorway
Wentworth Street
M4 Motorway
Martha Street
Short Street
7
8
9
10
11
12
13
14
0
400 m


Tunnel
Depth of tunnel
Equivalent storeys (approximately)
Clyde stabling and maintenance facility
Harris Street
Alfred Street
Arthur Street
Oak Street
Hope Street
James Ruse Drive
Unwin Street
Shirley Street
27m (9)
30m (10)
33m (11)
42m (14)
33m (11)
27m (9)
30m (10)
31m (10)
7
8
9
10
11
12
13
14
Rosehill services facility
Indicative only, vertical exaggeration present

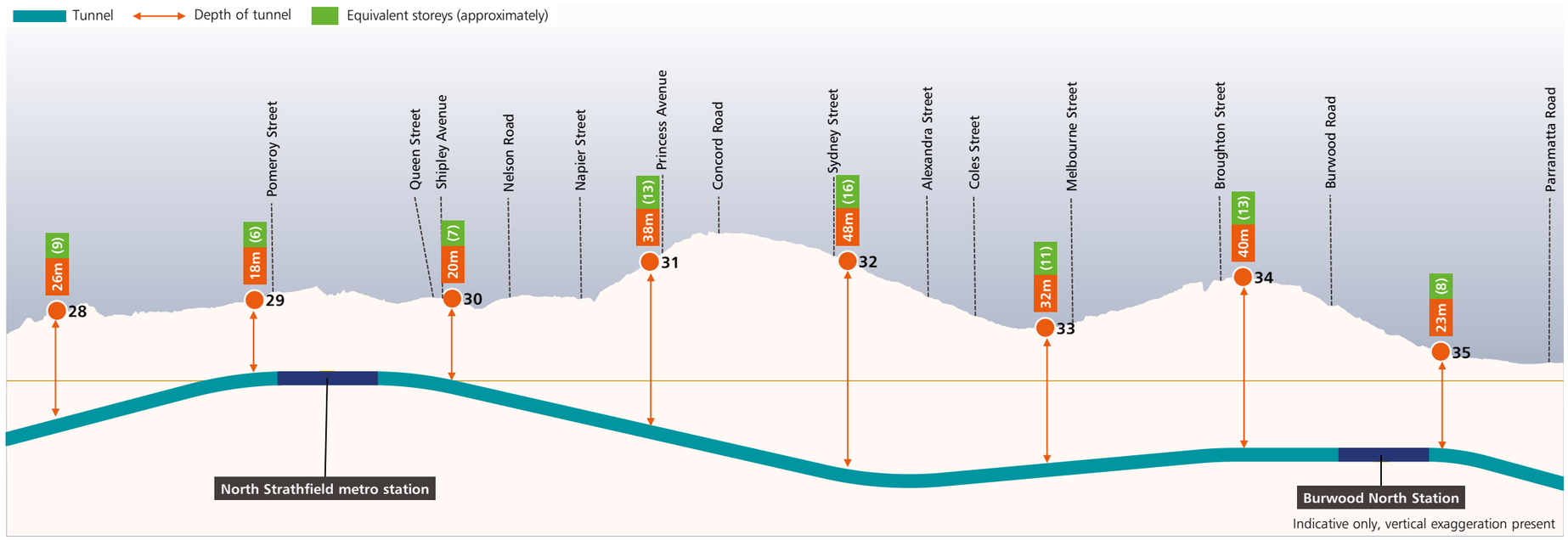
Silverwater to Sydney Olympic Park tunnel and corridor alignment



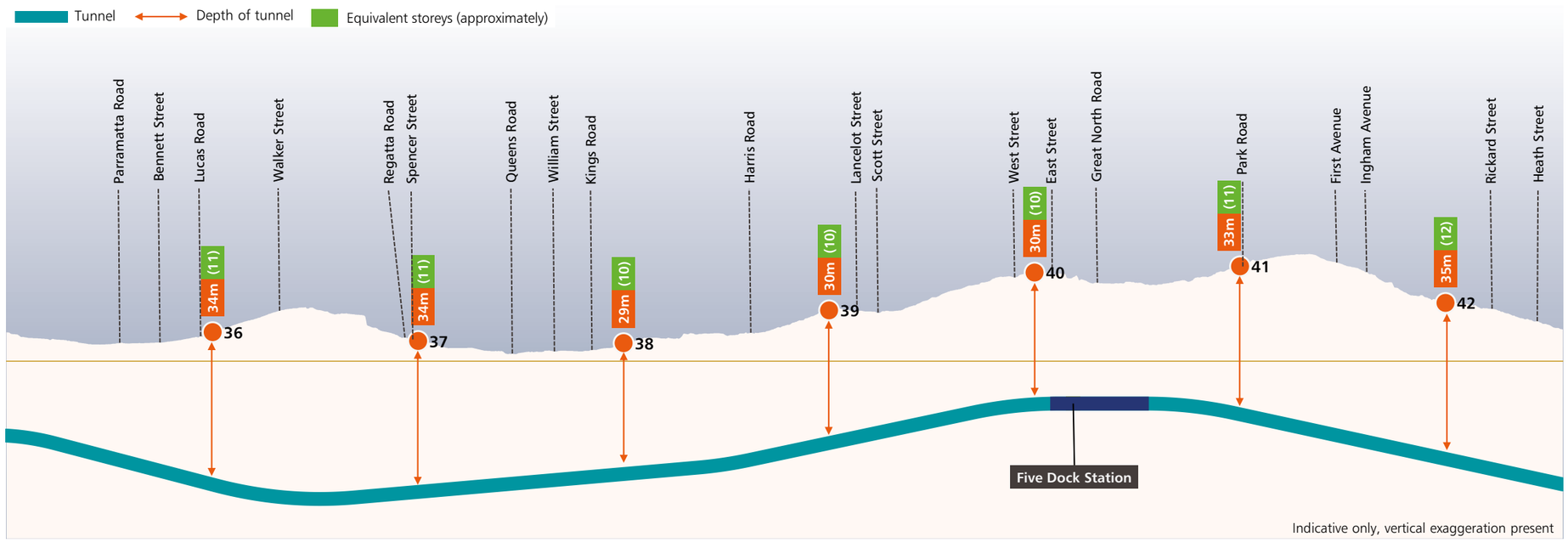

Tunnel
Construction site
Corridor
Westmead
The Bays
Kevin Coombs Avenue
New England Avenue
Barwon Avenue
Orana Parade
Grand Parade
Riverina Avenue
Murray Rose Avenue
Parkview Drive
Bennelong Parkway
Bicentennial Drive
Herb Elliott Avenue
Figtree Drive
Australia Avenue
Olympic Boulevard
Dawn Fraser Avenue
Old Hill Link
Edwin Flack Avenue
Hill Road
Shane Gould Avenue
Sarah Durack Avenue
Shirley Strickland Avenue
Rod Laver Drive
Homebush Bay Drive
Underwood Road
Pomeroy Street
21
22
23
24
25
26
27
28
0
400 m


Tunnel
Depth of tunnel
Equivalent storeys (approximately)
Pondage Link
Edwin Flack Avenue
Olympic Boulevard
Grand Parade
Showground Road
Murray Rose Avenue
Herb Elliott Avenue
Figtree Drive
Sarah Durack Avenue
Australia Avenue
Bicentennial Drive
Homebush Bay Drive
George Street
31m (10)
27m (9)
20m (7)
25m (8)
35m (12)
33m (11)
21m (7)
26m (9)
21
22
23
24
25
26
27
28
Sydney Olympic Park metro station
Indicative only, vertical exaggeration present

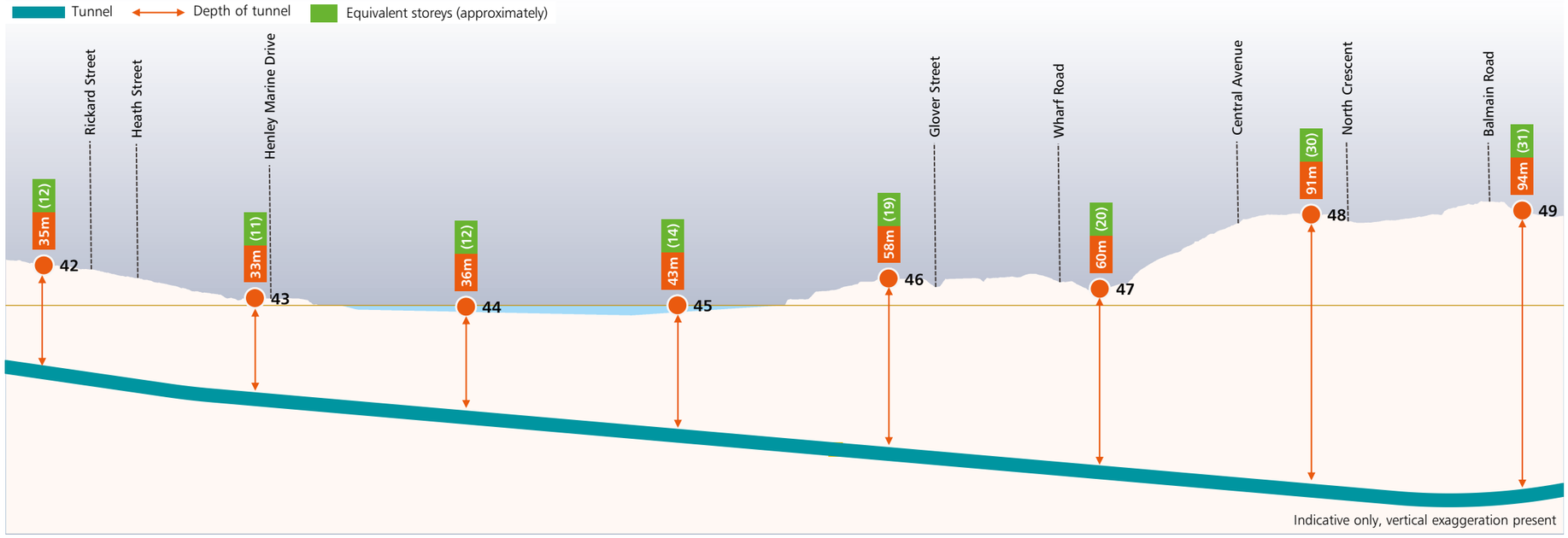
North Strathfield to Five Dock tunnel and corridor alignment

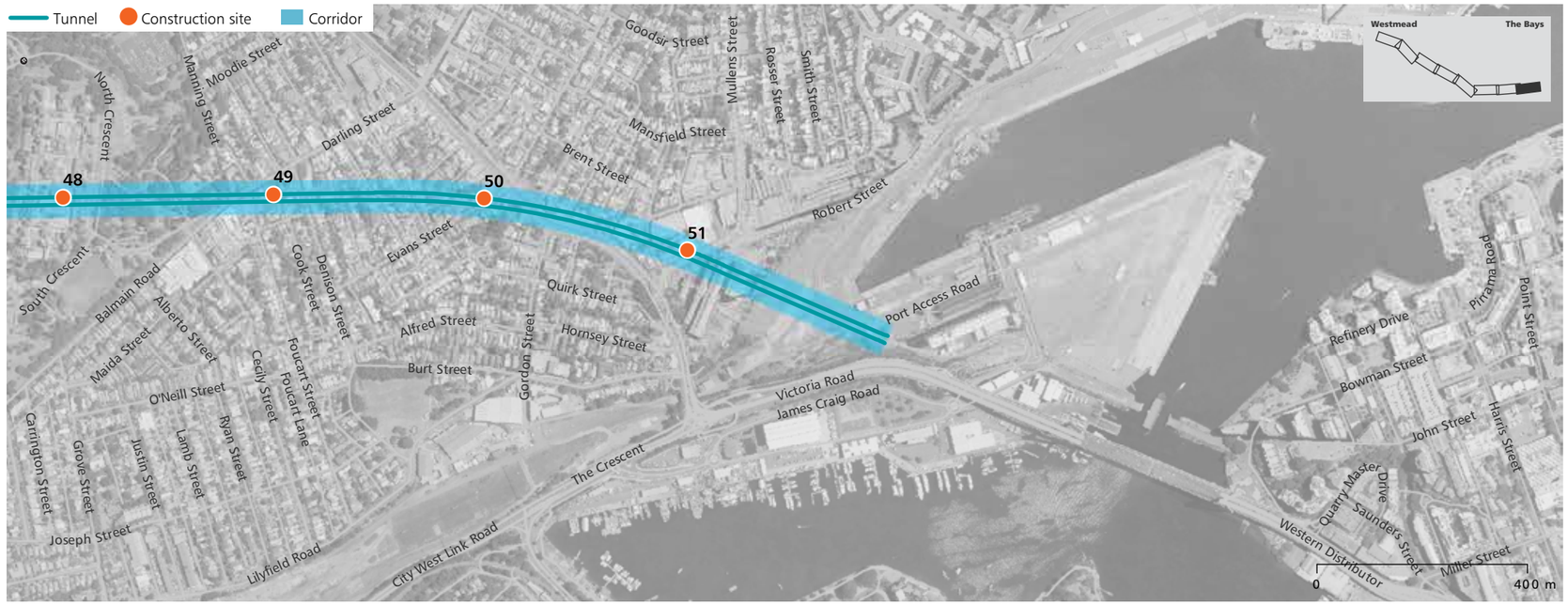


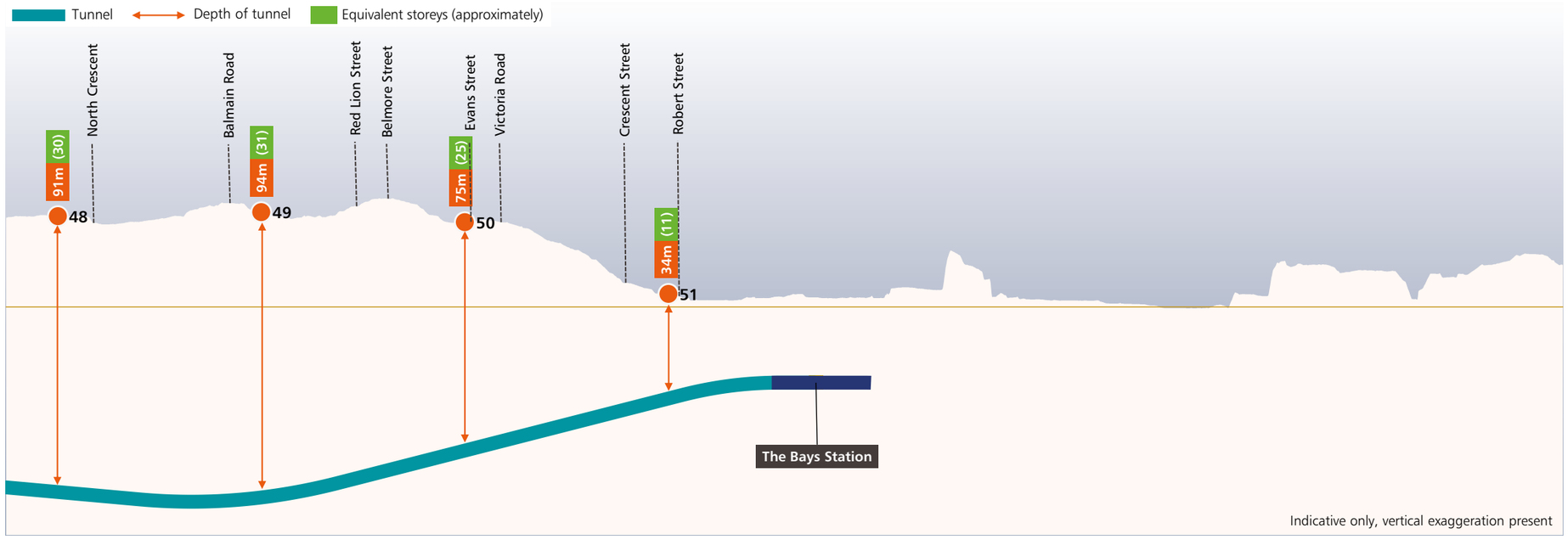

Tunnel
Construction site
Corridor
Westmead
The Bays
Lyons Road
Newcastle Street
Henry Street
Scott Street
West Street
East Street
Jersey Lane
Rodd Road
Barnstaple Lane
Trevanion Street
Barnstaple Road
Park Road
Noble Street
Howley Street
Heath Street
Second Avenue
First Avenue
Rickard Street
Fairlight Street
Minnesota Avenue
Connecticut Avenue
Ingham Avenue
Norman Street
Ramsay Road
Murralong Avenue
Harrabrook Avenue
Henley Marine Drive
Dobroyd Parade
Thompson Lane
Great North Road
Garfield Street
Kings Road
Cross Street
Harris Road
William Street
Queens Road
Regatta Road
Bayview Road
Walker Street
Gipps Street
Loftus Street
Parramatta Road
Grogan Street
Dalmar Street
Monash Parade
Acton Street
Lang Street
Arlington Street
York Avenue
Royce Avenue
Cheltenham Road
Lucas Road
Bennett Street
Luke Avenue
Shaftesbury Road
35
36
37
38
39
40
41
42
0
400 m


Tunnel
Depth of tunnel
Equivalent storeys (approximately)
Parramatta Road
Bennett Street
Lucas Road
Walker Street
Regatta Road
Spencer Street
Queens Road
William Street
Kings Road
Harris Road
Lancelot Street
Scott Street
West Street
East Street
Great North Road
Park Road
First Avenue
Ingham Avenue
Rickard Street
Heath Street
34m (11)
34m (11)
29m (10)
30m (10)
30m (10)
33m (11)
35m (12)
36
37
38
39
40
41
42
Five Dock Station
Indicative only, vertical exaggeration present

Five Dock to The Bays tunnel and corridor alignment




Tunnel
Construction site
Corridor
Westmead
The Bays
48
49
50
51
North Crescent
Manning Street
Moodie Street
Darling Street
Goodsir Street
Mullens Street
Rosser Street
Smith Street
Mansfield Street
Brent Street
Robert Street
South Crescent
Balmain Road
Alberto Street
Maida Street
Cook Street
Denison Street
Evans Street
Quirk Street
Alfred Street
Hornsey Street
Burt Street
Gordon Street
Foucart Street
Foucart Lane
Cecily Street
O'Neill Street
Ryan Street
Lamb Street
Justin Street
Grove Street
Carrington Street
Joseph Street
Lilyfield Road
City West Link Road
The Crescent
Victoria Road
James Craig Road
Port Access Road
Refinery Drive
Bowman Street
Pirrama Road
Point Street
John Street
Harris Street
Quarry Master Drive
Saunders Street
Miller Street
Western Distributor
0
400 m


Tunnel
Depth of tunnel
Equivalent storeys (approximately)
North Crescent
Balmain Road
Red Lion Street
Belmore Street
Evans Street
Victoria Road
Crescent Street
Robert Street
91m (30)
94m (31)
75m (25)
34m (11)
48
49
50
51
The Bays Station
Indicative only, vertical exaggeration present


Apurva

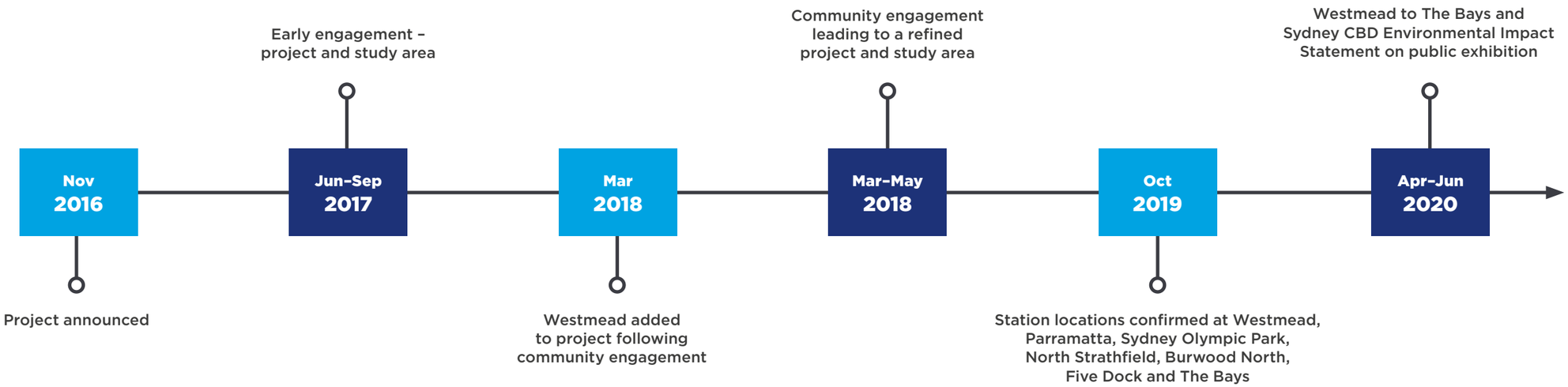
Working with the community and stakeholders

Community information sessions for Sydney Metro West.

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 as part of formal exhibition phases of the project (see page 89).

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

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

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

Community values are important to consider when designing the stations

Local impacts like parking and traffic are important to me

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

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

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

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

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

I think it will make the area better and reduce congestion

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

Stations should be fully accessible

A new Sydney Metro Station.


M
CAFE
SYDNEY OLYMPIC PARK

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 accessible as possible.

Visit **majorprojects.planning.nsw.gov.au** to view the full Environmental Impact Statement.

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

Visit **[insert spatial media link]** to view an interactive map of the project, find out what you can expect in your area and meet 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.

Check your local paper for updates.

Follow us on Facebook.

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 **majorprojects.planning.nsw.gov.au** 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 আবশ্যক **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**. وبعد ذلك سيقوم المترجم بمساعدتكم في الترجمة.

Εάν χρειάζεστε τις υπηρεσίες διερμηνέα, 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 को फोन 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。

sydneymetro.info