



# Transforming Sydney

## Program overview



2019





# Australia's biggest public transport project

A once-in-a-century  
infrastructure investment,  
transforming Sydney with  
a world-class metro.

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Premier's message

In 2012, as the Minister for Transport, I vividly recall the ground-breaking decision to fundamentally change how we get around Sydney – the introduction of a third tier of train travel, a mass transit metro system unlike anything seen in Australia.

It was a move taken with the future of Sydney at its core.

As we broke ground at the site of the future Bella Vista station, the vision of this new metro railway started to turn to reality.

In 2015, through the successful process of recycling NSW Government assets, we were able to quickly start extending Sydney Metro from the city's north west, under Sydney Harbour, through new city stations and beyond to the south west.

In 2019, the first 13 Sydney Metro stations open, to be followed by 18 more in 2024, when Sydney will have a 66 kilometre world class standalone metro system.

This is a journey that is transforming Sydney – and it's only the beginning.

**Gladys Berejiklian MP**  
Premier of New South Wales



Minister's message

Welcome to the Year of the Metro.

With the opening of Sydney Metro in 2019, public transport in Australia's only global city takes its biggest leap in a century.

This world-scale program of works will shape the future of our great city for generations to come.

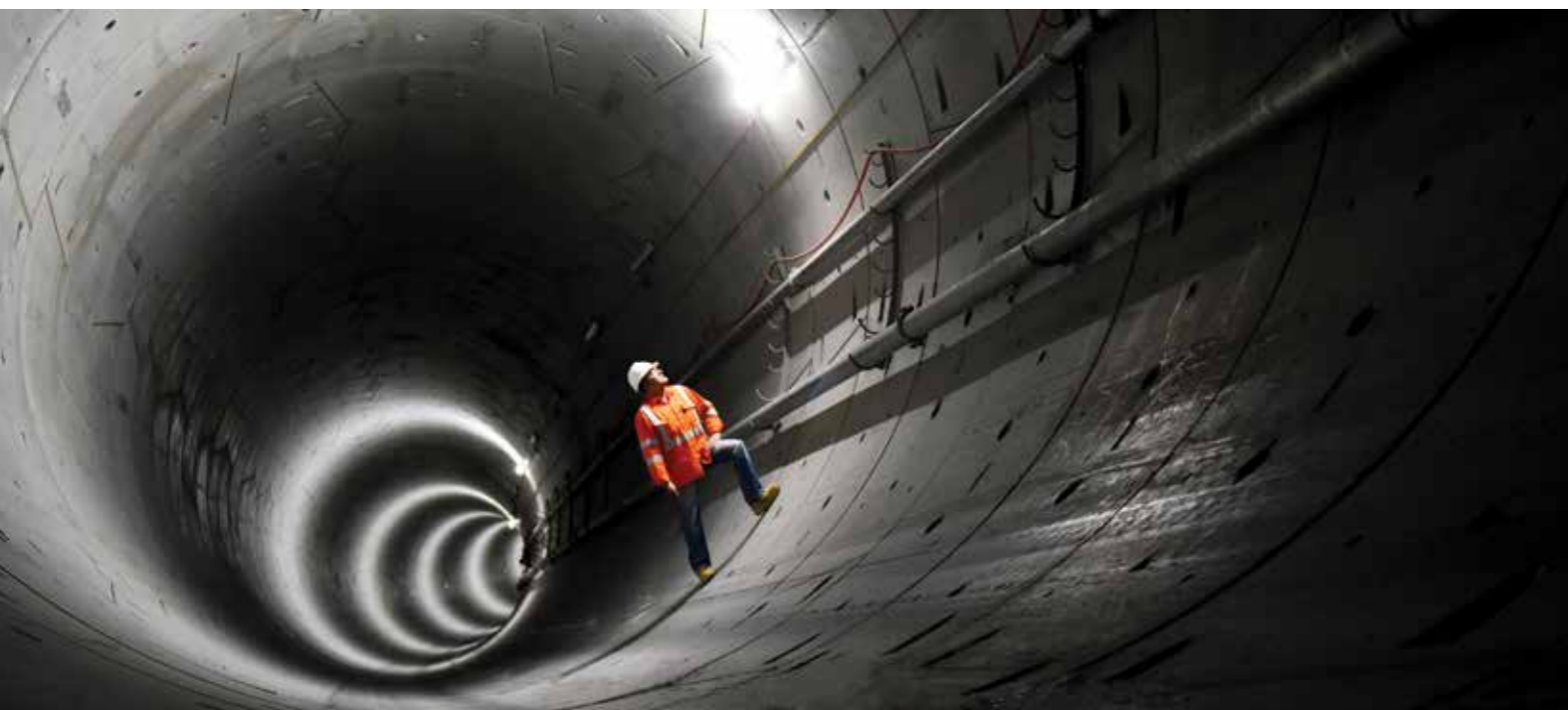
Like the first car crossing the Sydney Harbour Bridge almost a century ago, the first passenger service of Australia's first metro railway will revolutionise Sydney.

This is a journey of many firsts, including the nation's first fully-automated passenger railway and a new generation of fast, safe and reliable driverless trains.

New levels of customer service and safety will set a new benchmark – a fully accessible metro train every four minutes in the peak where customers won't need a timetable, they'll just turn up and go.

Welcome aboard Sydney Metro, as we deliver tomorrow's Sydney.

**Andrew Constance MP**  
Minister for Transport and Infrastructure



Click to play video  
**High speed train testing**





# Delivering tomorrow's Sydney

## Sydney Metro is a new world-class railway.

Services start in the city's north west in 2019 on Australia's first fully-automated driverless railway, with 13 metro stations and 4,000 new commuter car parking spaces.

A new generation of metro trains will run every four minutes in the peak in each direction. Customers won't need a timetable, they'll just turn up and go.

Sydney's fast, safe and reliable metro trains are fully-air conditioned with new customer benefits like multi-purpose spaces for luggage and parents with prams, as well as wheelchair spaces and priority seating in each carriage.

Technology like platform screen doors – used for the first time in Australia – will keep people and objects away from the tracks, also allowing trains to get in and out of stations much faster.

All metro stations will be fully accessible with lifts and level access between platforms and trains, making it easier for more customers to use public transport.

From the north west, metro rail is being extended under Sydney Harbour, through new underground city stations and beyond to Bankstown in the south west.

In 2024, Sydney will have 31 metro railway stations and a 66 kilometre standalone metro railway system.

There will be capacity for a metro train every two minutes in each direction under the Sydney city centre.

Sydney's new metro, together with signalling and infrastructure upgrades across the existing Sydney suburban rail network, will increase the capacity of train services entering the Sydney CBD – from about 120 an hour currently to up to 200 services beyond 2024. That's an increase of up to 60 per cent capacity across the network to meet demand.

New metro rail will be extended to Western Sydney in the second half of the 2020s – the Sydney Metro West project will link the Sydney city centre with Greater Parramatta, doubling rail capacity between these centres and linking communities along the way with a new underground railway.

Metro rail will also service Greater Western Sydney and the new Western Sydney Airport, linking it with the rest of Sydney. The Australian and NSW governments are equal partners in the delivery of this new railway by 2026, when the airport is scheduled to open.



Click to play video  
**First full journey**

This new landmark over Windsor Road at Rouse Hill, pictured above and right, is Australia's first cable stayed railway bridge built on a curve.



Sydney Metro – a new NSW Government agency established on 1 July 2018 – has been tasked with developing and delivering metro railways and managing their operations.

Sydney Metro also leads the development of vibrant station precincts to meet customer and community needs, transforming the way Sydney travels and helping shape the future of Australia's largest city.

Sydney's new world-scale metro system is the biggest program of public transport infrastructure currently under construction in Australia and the largest urban rail infrastructure investment in the nation's history.

# The biggest urban rail project in Australian history



## Northwest

Open 2019

Sydney Metro Northwest



13 stations



4000 commuter car parks

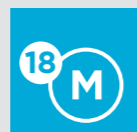


36 kilometres

## City & Southwest

Open 2024

Sydney Metro City & Southwest



18 stations



New CBD connections



30 kilometres, including under Sydney Harbour

## West

Open second half of 2020s

Sydney Metro West (final alignment to be confirmed)



Connecting Parramatta and Sydney CBDs



Five key precincts serviced



3.2 Million Western Sydney population, 2036

## Western Sydney Airport

Open 2026

(final alignment to be confirmed)



Connecting Western Sydney Airport to the rest of Sydney



Servicing Greater Western Sydney



Opening together with new airport



Click to play video  
Tracks to the future

# Shaping Sydney's future

## Sydney Metro will guide Sydney's growth for the 21st century.

This new world-class mass transit system will evolve with the city it will serve for generations to come.

Global 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 an extra 840,000 jobs and 680,000 homes.

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

Designed with customers at its centre, stations will be quick and easy to get in and out of; trains will be fast, safe and reliable; and technology will keep customers connected at every step of the journey.

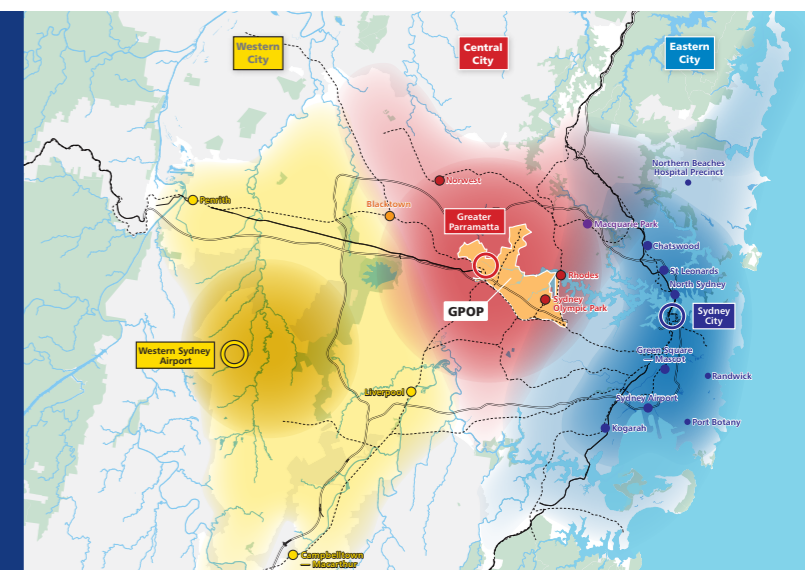
Sydney Metro will integrate with new communities and transform existing urban centres.



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

Centred on the '30-minute cities' concept, 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.

Integral to this investment is the Sydney Metro program of works. This once-in-a-century investment is the step-change to achieving well-connected and vibrant places that re-imagine the Greater Metropolitan Area – and reduce the traditional reliance on long-haul, peak-hour-only commutes to and from major employment centres.



A Metropolis of Three Cities.  
Source: The Greater Sydney Commission.

# New opportunities

## Sydney Metro brings wide economic benefits to a global city.

The City & Southwest project alone will deliver an economic boost of up to \$5 billion a year.

As a social asset, this new railway will transform places and make the city more liveable and connected.

Faster journey times and a broadened public transport network will allow people to be more connected to job centres and educational institutions, delivering more opportunities across Sydney.

Sydney will be more productive and more attractive globally: the new metro product will improve liveability, enhance productivity and promote connectivity across Greater Sydney.

The success of the Sydney Metro program of works relies on both the step-change which comes with a new-generation metro rail service and its effective integration into the wider city.



Thy Pham, Northwest Rapid Transit engineer.



Click to play video  
One stop skills shop



Transport for NSW has released the Future Transport 2056 draft strategy, focusing on decisions that need to be made now to help prepare NSW for the next 40 years.

It 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.

The strategy can be found at: [future.transport.nsw.gov.au](https://future.transport.nsw.gov.au)



Click to play video  
Meet Thy Pham



Sydney Metro Transforming Sydney 13

- The NSW Infrastructure Skills Centre is Australia's first one-stop shop for infrastructure jobs and skills training. Led by Sydney Metro, it is meeting the demand of Sydney's booming infrastructure program.
- Three specialist training locations across Sydney - in Annandale, Nirimba and Ingleburn - are training apprentices, trainees and a new generation of workers.
- More than 500 apprentices and trainees have worked on Sydney's new railway.
- Sydney Metro Northwest has exceeded its apprentice and trainee target of 123 over 20 weeks, with 169 working on this project.

METRO  
MEANS





# Transforming Sydney

Revolutionising how Australia's biggest city travels, and shaping its future growth.

This 21st century railway system will cut travel times, reduce congestion and deliver major economic and social benefits for generations to come.

Metro rail means a new generation of world-class fast, safe and reliable trains easily connecting customers to where they want to go.

Customers won't need timetables - they'll just turn up and go with a train every four minutes in the peak.

Designed to grow with the city, Sydney Metro will have an ultimate future capacity of a train every two minutes in each direction under the CBD.

Technology will keep customers connected at all stages of their journey.

This fast, frequent and easy-to-use service will help 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.



Click to play video  
Australian first



## METRO MEANS

- MOVING** more people faster than ever before
- QUICK** and easy interchange to trains, buses, ferries and light rail
- TAKING** the guesswork out of travel - no need to plan, just turn up and go
- INTEGRATING** with other city-building transport projects.



# Supporting jobs

Employment across Sydney is expected to increase from 2.1 million workers today to almost 4 million by 2036.

About 60 per cent of Sydney's population will work in the Global Economic Corridor stretching from Macquarie Park, through Chatswood, North Sydney, the Sydney CBD and on to Sydney Airport.

Sydney Metro will connect people across Sydney to these jobs.

Over the next 15 years, NSW will require infrastructure to support 40 per cent more train trips, 30 per cent more car trips and 31 per cent more households.

Sydney Metro is identified as a key part of the NSW Government's infrastructure investment program.

























The NSW Government is committed to the creation of 150,000 new jobs over the next four years.

Through investment in infrastructure such as Sydney Metro, new jobs and apprenticeships are being created for the construction sector.

## METRO MEANS

- IMPROVING access to jobs
- CHANGING the way people move about the city, reducing congestion
- FASTER trips, allowing people to travel from one key centre to another in minutes
- INCREASING productivity, wages and the State's overall economic performance.

### Key Sydney growth levels 2011-2036

NORTHWEST		CBD		SOUTHWEST		TOTAL	
2011	2036	2011	2036	2011	2036	2011	2036
<b>HOUSES</b>							
							
30,933	90,997	20,158	29,541	51,173	85,089	102,264	205,636
<b>JOBS</b>							
							
133,450	208,208	390,795	517,897	37,861	48,447	562,106	774,552
<b>PEOPLE</b>							
							
77,333	227,493	50,396	73,853	127,932	212,744	255,661	514,090





### Catalyst for renewal

New development opportunities within existing centres



### New communities

Vibrant places centred around metro station locations



### Infill development

Adjacent to metro stations within existing centres



### Integrated station developments

Opportunities integrated with new stations at existing commercial centres



## A customised strategy. Creating great places in a global city.

Sydney's new metro stations create exciting opportunities to bring together international best practice and innovative urban thinking to shape vibrant and attractive places in the precincts around each station.

Joining other great global mass transit development initiatives, the NSW Government has identified stations on the Sydney Metro system that can be better integrated with the areas around them, creating world-class places that will shape the city's future.

These opportunities bring a new international standard of place: vibrant neighbourhoods help strengthen communities, attract investment and enhance liveability. They are supporting and developing local communities. Through place making, Sydney Metro stations will be more than somewhere to catch the train; they will be the centre of communities through a variety of uses.



# Supporting communities

## New and diverse opportunities will support changing communities.

The Sydney Metro mass transit system will be integrated into active precincts around each metro station.

Vibrant transport, commercial and residential mixed-use opportunities around stations will be critical to realising the best outcomes for communities.

This key strategy for the optimal development and activation of precincts will:

- support the NSW Government's planning strategies and objectives to maximise urban outcomes,
- enhance customer experience and urban amenity
- create an urban environment that drives high usage of new metro rail
- ensure station precincts are activated as soon as possible following completion of the metro infrastructure.



Click to play video  
Transforming places



# The customer is at the centre

## Sydney Metro will get you where you need to go – easily and quickly.

The new metro rail system will be an easy part of daily journeys.

Technology will keep 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 will help 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 get customers to and from metro services easily.

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

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



### Faster services

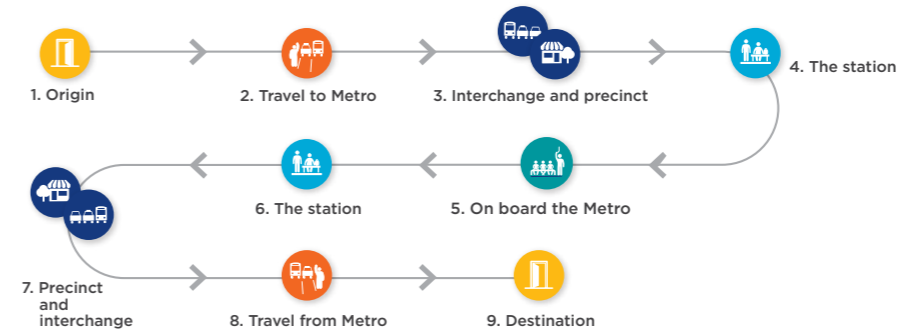
Save more than one hour a week between Bankstown and Central.



## The customer experience

### New lifts, fully accessible services

Level access between the platform and train. New technology like video help points.



### Door to door

Making it easier for customers at every step of their journey.



Click to play video  
Live from Australia's first metro station

### Safer services

Customer service attendants throughout the Sydney Metro system. Platform screen doors.



### A new metro train every four minutes in the peak

Ultimate capacity for a new metro train every two minutes in each direction under the CBD.



All stations have been 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.

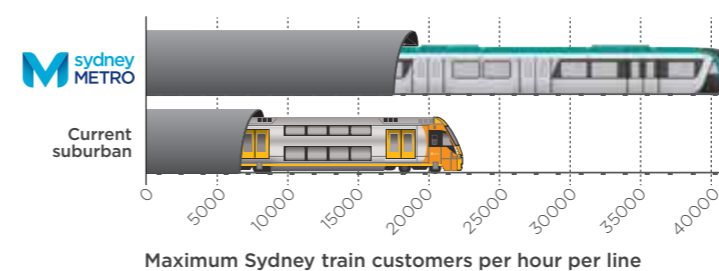
Customer safety is the number one priority for Australia's first fully-automated railway.

At all times, a team of expert train controllers will monitor the system, making sure everything runs smoothly.



### More opportunities

Faster, more frequent and direct access to key employment centres, wider selection of schools and better access to health care.



### Customers first

All trains are air-conditioned. New multiple purpose areas for prams and luggage. Wheelchair spaces and priority seating.



Sydney Metro will take customers off existing suburban rail lines, especially in the busy morning peak – cutting crowding and easing congestion.

Australia's first fully-automated railway will be able to move more than 40,000 people an hour in each direction.

Suburban Sydney lines can each reliably move about 23,000 people an hour.

# Sydney's new metro train

## KEY FACTS

- 98%** On-time  
Running reliability
- 00:02** Ultimate capacity  
A train every two minutes each way under the CBD
- Connected**  
Continuous mobile phone coverage through network
- No timetable**  
Customers will just turn up and go
- Opal** Opal ticketing
- Video help points**  
on all platforms
- 38 cameras** on each train

## TRAIN FEATURES

Customer service assistants at every station and moving through the network during the day and night

Heating and air conditioning

Level access between platform and train

Inside you can see from one end of the train to the other

Platform screen doors keep people and objects away from the edge and allow trains to get in and out of stations much faster

Double doors for faster loading and unloading

Two multi-purpose areas per train for prams, luggage and bicycles

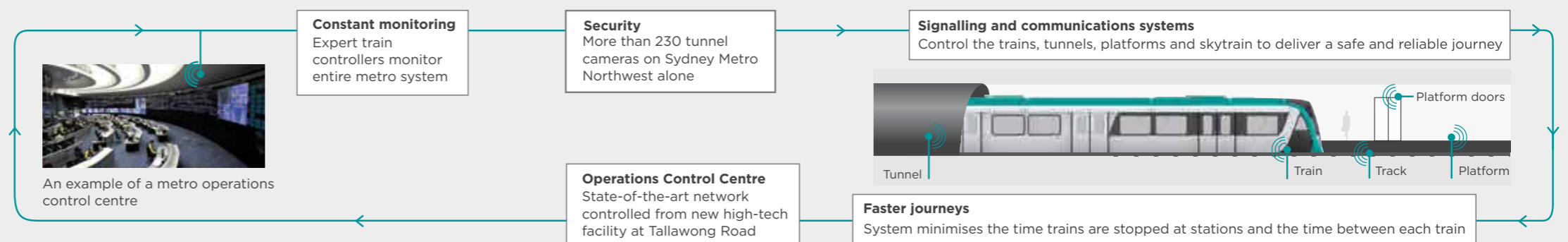
Wheelchair spaces, separate priority seating and emergency intercoms

Real-time travel information and live electronic route maps

## SAFETY

Sydney Metro is Australia's first fully-automated metro rail network

Around the world, millions of people use these networks every day in cities like Paris, Singapore, Dubai and Hong Kong



Click to play video

A 360-degree walk through Sydney's new metro train





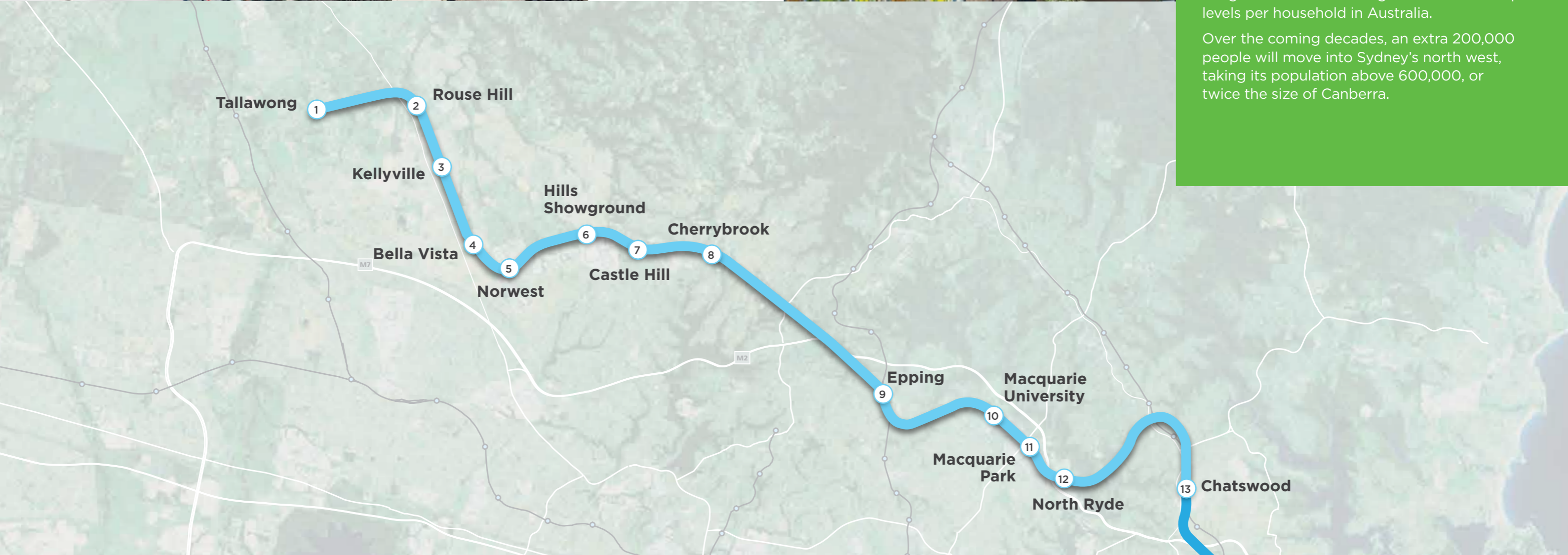
**36**  
kilometres



# Northwest

Sydney Metro Northwest will deliver, for the first time, a reliable public transport service to a region which has the highest car ownership levels per household in Australia.

Over the coming decades, an extra 200,000 people will move into Sydney's north west, taking its population above 600,000, or twice the size of Canberra.



Open  
**2019**



Click to play video  
Train testing starts  
in the north west



Testing  
Sydney's new  
metro trains  
started in  
March 2018.



**\$8.3**  
billion





**All 52 kilometres of track laying on Sydney Metro Northwest was completed in 2018.**



**The first full 36km journey on the Northwest line was completed on 14 January 2019.**



**Sydney Metro Trains Facility**

The Sydney Metro Trains Facility at Rouse Hill is where the new metro train fleet will be stabled and maintained.

This new state-of-the-art facility is the operational headquarters of Sydney Metro.

From 2019, 22 metro trains will be located on site. In 2024 it will provide stabling for 46 trains and maintenance services for a fleet of 76 trains to meet the needs of Sydney's broader metro rail system.

The secure site includes:

- train stabling area
- infrastructure maintenance facilities
- administration buildings including an operations control centre
- a power sub-station.

Trains will be stored in the train stabling facility outside peak periods and between the last service and the first service the next day. Trains will be shut down once the train has been stabled and cleaned.

**Epping to Chatswood metro upgrade**

Sydney Metro Northwest connects directly with the existing railway between Epping and Chatswood, allowing new metro rail to connect the north west to the Sydney CBD.

The line was closed in late 2018 to be upgraded to metro rail standards, including the installation of 26 kilometres of new cabling, power and signalling systems and customer improvements.

The five existing stations along the line – at Epping, Macquarie University, Macquarie Park, North Ryde and Chatswood – will have screen doors along the full length of the metro platforms to keep people and objects away from the tracks, improving customer safety and allowing trains to get in and out of stations much faster.

Sydney Metro will service these stations with almost four times as many trains an hour than the previous suburban rail service.

**Project features**

-  A train at least every **4 minutes** in the peak
-  **4000** commuter car parking spaces
-  **8 new** railway stations
-  **5 existing** railway stations upgraded
-  **36km** total project length
-  **23km** of new metro line
-  **15km** twin tunnels Bella Vista to Epping
-  **4km** elevated skytrain Rouse Hill to Bella Vista

**The skytrain**

This viaduct runs four kilometres from Bella Vista to Rouse Hill.

Following community consultation, the skytrain was an engineering solution to delivering new railway infrastructure in an urban environment where tunnelling through a floodplain also would not have been practical.

The skytrain component of the project also allowed two extra railway stations to be added to Sydney Metro Northwest.

The skytrain was delivered by two giant horizontal cranes – each weighing 600 tonnes – with minimal construction impacts on nearby Windsor Road, which carries 50,000 vehicles a day.

The skytrain project includes a 270-metre landmark new railway bridge over Windsor Road at Rouse Hill, similar in design to Sydney's Anzac Bridge. It's the first cable-stayed railway bridge built on a curve in Australia.

Skytrain construction was completed in 2017, with track laying completed on the skytrain in 2018.

The landmark new railway bridge over Windsor Road at Rouse Hill was named 2018 global project of the year by US-based Engineering News-Record, which described it as elegant, innovative and sustainable.

# New CBD stations

New metro stations at Barangaroo, Martin Place, Pitt Street and Central will take the pressure off Town Hall and Wynyard stations.



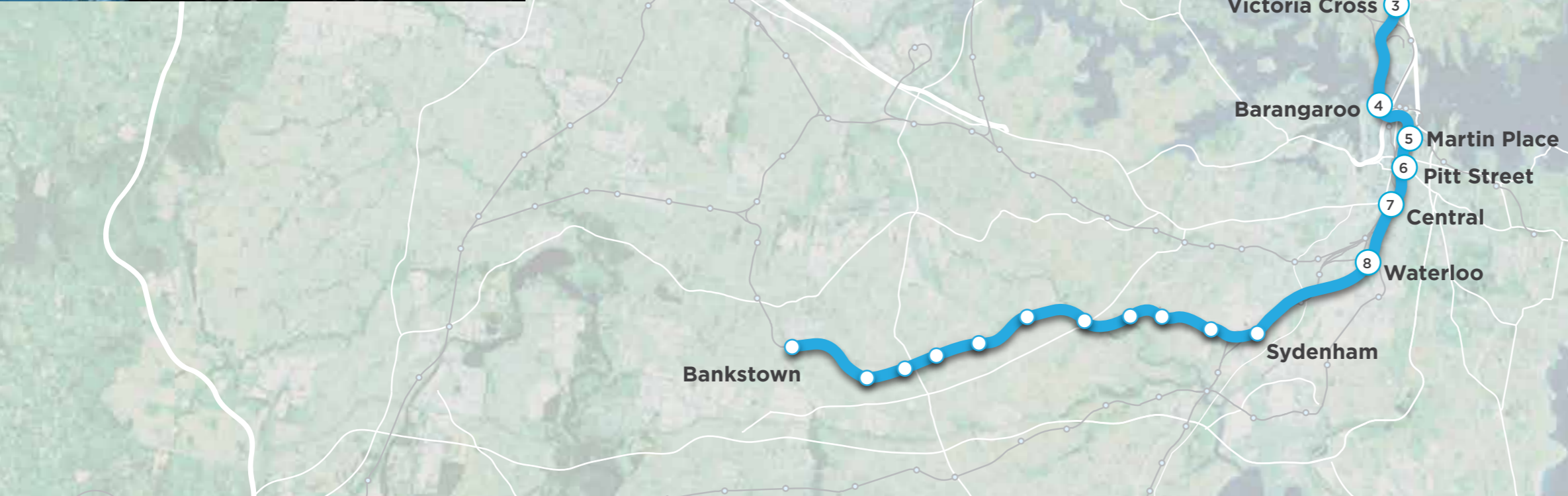
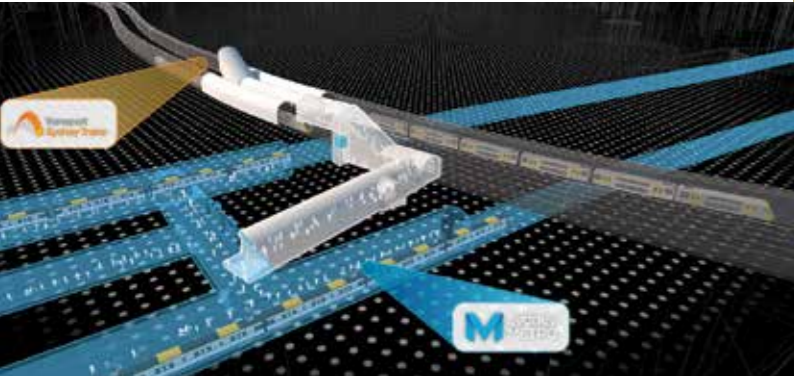
**\$11.5 to \$12.5 billion budget range**



# City & Southwest

From the north west, metro rail is being extended under Sydney Harbour, through new underground city stations and beyond to the south west.

Tunnelling started in October 2018 to deliver the twin 15.5-kilometre metro rail tunnels between Chatswood and Sydenham.




**Open 2024**



**30 kilometres**



  
Click to play video  
Start of city tunnelling

## Sydney Harbour tunnelling

A specialised tunnel boring machine (TBM) will be used for the harbour crossing.

The borer will balance the pressure between the machine and the ground in front of it, helping control the excavation process. This type of machine is commonly used in similar projects around the world and was also used to deliver Sydney's airport rail link tunnel in the 1990s.

Sydney Metro conducted geotechnical work deep under Sydney Harbour to help determine the best way to deliver the new metro railway tunnels. Rock and soil samples from more than 50 boreholes dug deep under Sydney Harbour helped determine that a specialised TBM will be required to tunnel between the new metro station at Barangaroo and Blues Point.

Crushed rock will be removed by barges for the excavation work that takes place at Blues Point and Barangaroo, reducing impacts to the road network and cutting truck movements.

## Bankstown Line upgrade

The upgrade of the Bankstown Line to metro standards means all 11 stations between Sydenham and Bankstown will be fully accessible with lifts, platform screen doors and level access between platform and trains at all stations.

When Sydney Metro services start in 2024, there will be 15 trains an hour at all stations during the peak – a major boost to train services for customers. Currently on the Bankstown Line, stations like Hurlstone Park and Canterbury are serviced by as few as four trains an hour in the peak.

Upgrading the T3 Bankstown Line to Sydney Metro standards is vital to the future of Sydney's transport network – it will boost capacity and provide a more reliable journey for customers.

Sydney Metro will celebrate the line's significant heritage history while preserving, where possible, both Indigenous and non-Indigenous cultural heritage.



Click to play video  
Blues Point heritage

METRO  
MEANS

Preserving  
the past,  
delivering  
the future



- Sydney Metro has a strong track record of heritage conservation, and will continue to work collaboratively with local stakeholders and relevant government agencies to ensure cultural heritage is protected.
- On Sydney Metro Northwest, the remains of the early 1800s White Hart Inn were preserved after it was discovered during early works in 2013. A pier on the skytrain was moved to avoid the heritage site
- In mid-2018, work on a tunnel boring machine retrieval site at Blues Point revealed a glimpse of life in Sydney in the mid-1800s. Archaeological finds include the footings of a 19th century house on the shores of Sydney Harbour and artefacts from 1850s-1900s Sydney, including toys like dolls and tea sets, cooking equipment and glass and crystal drinkware.







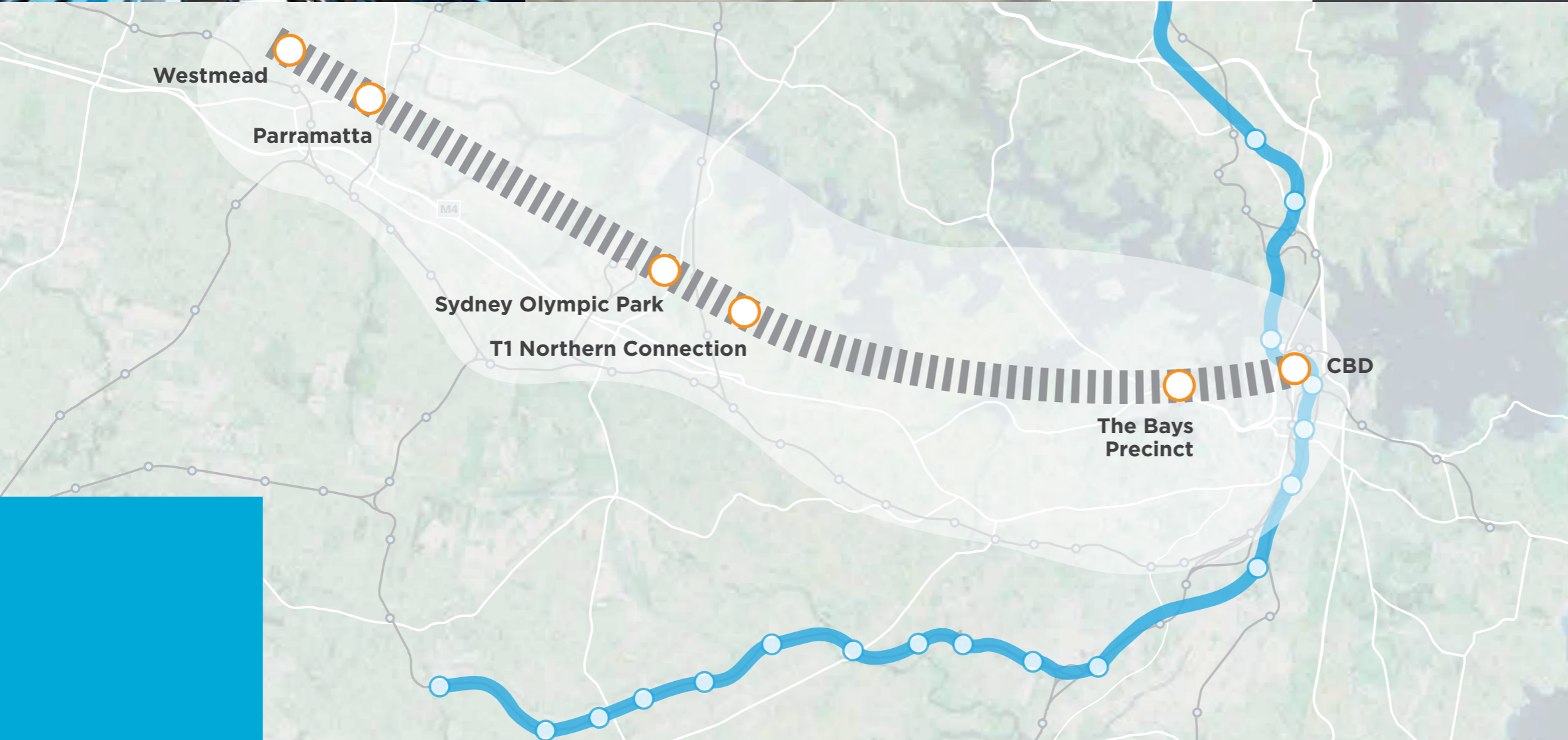
# West

New metro rail will become the fastest, easiest and most reliable journey between the Sydney and Parramatta CBDs under the proposed Sydney Metro West project.

As a new railway, Sydney Metro West will work together with the existing T1 Western Line, effectively doubling rail capacity from Parramatta to the CBD and supporting the Greater Sydney Commission's vision for better connections between these two major centres.

This means Sydney Trains and inter-city services will be freed up for customers in the city's outer west in areas like Blacktown, Penrith and the Blue Mountains. In turn, these services will become more reliable, with increased capacity, reduced crowding and faster travel times.

The NSW Government will integrate transport and land use planning along the corridor, with the new metro railway line expected to be built largely underground.



Click to play video  
Project update

## Servicing key precincts

The final number of potential stations will be identified following community and industry consultation. Five key precincts to be serviced have initially been identified at:

- **Parramatta**, where the number of jobs is expected to double over the next 20 years to 100,000
- **Sydney Olympic Park**, where 34,000 jobs and more than 23,000 residents will be located by 2030
- **The Bays Precinct**, Sydney's new innovation hub where 95 hectares of land is being regenerated
- **Sydney CBD**, allowing easy access to the existing public transport network including Sydney Metro
- **Westmead**, to support the growing residential area as well as the health, research and education precinct



Geotechnical drilling took place along the proposed route in 2018.





Click to play video

Western Sydney City Deal



## Western Sydney Airport

The railway servicing the new Western Sydney Airport will be developed and delivered by Sydney Metro.

The project will become the spine for the region's growth for generations to come, connecting communities and travellers within Western Sydney and the rest of Sydney with a fast, easy and reliable metro service.

Key stations will be built at the airport, Western Sydney Aerotropolis, and at St Marys - where customers will interchange at the existing suburban station and connect with the rest of Sydney's railway system.

World-class metro rail means better access to more places, faster travel times, less congestion on roads and a reduced reliance on cars.

The Australian and NSW governments are equal partners in the delivery of the project by 2026, when Western Sydney Airport is scheduled to open.

The airport will support nearly 28,000 direct and indirect jobs by 2030 and also underpin the development of a new city centre around it - Western Sydney Aerotropolis.

The aerotropolis will support around 200,000 new jobs in aerospace and defence, manufacturing, healthcare, freight and logistics, agribusiness, education and research industries.

Supporting the airport and aerotropolis is a key part of the Western Sydney City Deal, a 20-year agreement signed in March 2018 by the Australian Government, the NSW Government and eight Western Sydney councils.

The City Deal commits all levels of government to work together to deliver more jobs for Western Sydney and improve the region's liveability through 38 commitments to better connectivity and improved environment, housing, and education outcomes for the region.





METRO  
MEANS

## Metro power contract sets benchmark

- A new solar farm in the State's central west will help deliver metro rail services in Sydney's north west.
- The Beryl Solar Farm includes about 260,000 solar modules on a 145-hectare site outside Gulgong, and is expected to be supplying electricity to the power grid from mid-2019.
- Part of the electricity produced by Beryl will be used to offset the entire operational electricity needs of Sydney Metro Northwest – approximately 134,000 megawatt hours a year.
- The Beryl Solar Farm will create about 150 jobs during construction as well as ongoing employment when operational.

# Revitalising Central Station

Central Walk is the biggest improvement to the station in decades.

This new underground concourse from Chalmers Street will connect customers at Central Station to suburban rail platforms, Sydney Metro platforms, the new light rail and buses.

Completion of Central Walk is expected in 2022, when it will open to customers.

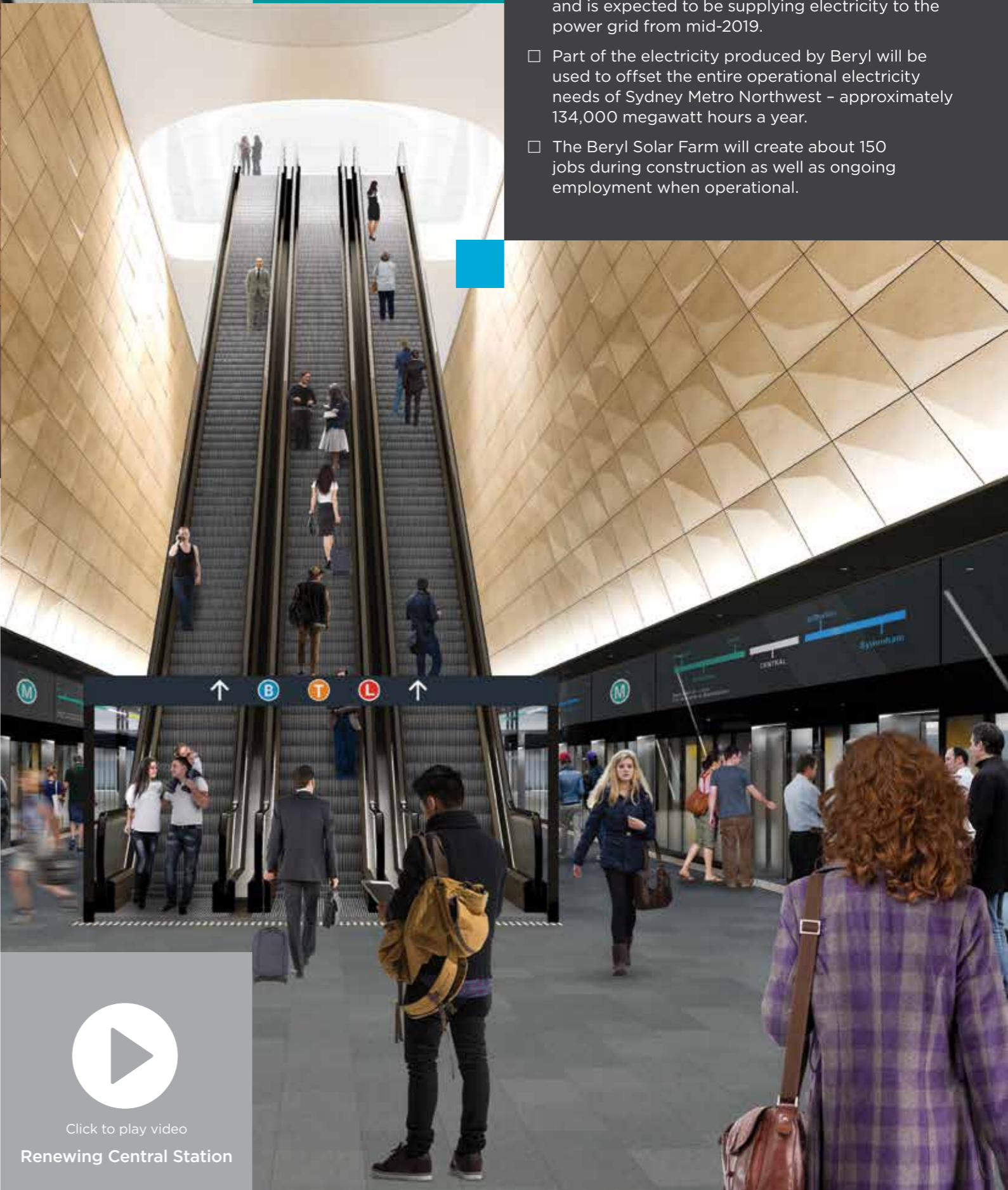
Work on building new Sydney Metro underground platforms at Central Station and the landmark Central Walk began in 2018, after Laing O'Rourke was awarded a \$955 million contract to transform Sydney's busiest station.

More than 270,000 people use Central every day, with that number expected to rise to 450,000 in the next two decades.

### Central Walk includes:

- a 19-metre wide tunnel from Chalmers Street linking to new Sydney Metro platforms under Central
- new, easy access points to Sydney Trains platforms 16 to 23
- escalators directly to suburban platforms for the first time.

Central Walk will help boost capacity at Central to cater for the expected 66 per cent increase in daily customer demand.



Click to play video  
Renewing Central Station

# A new Martin Place

Martin Place will be transformed with a \$378.6 million construction contract awarded in 2018 to deliver the new Sydney Metro railway station and the landmark integrated transport development above it.

Customers in the heart of Sydney's CBD will have access to an unprecedented level of public transport and will be more connected than ever before.

Martin Place is Sydney's first integrated metro station development.

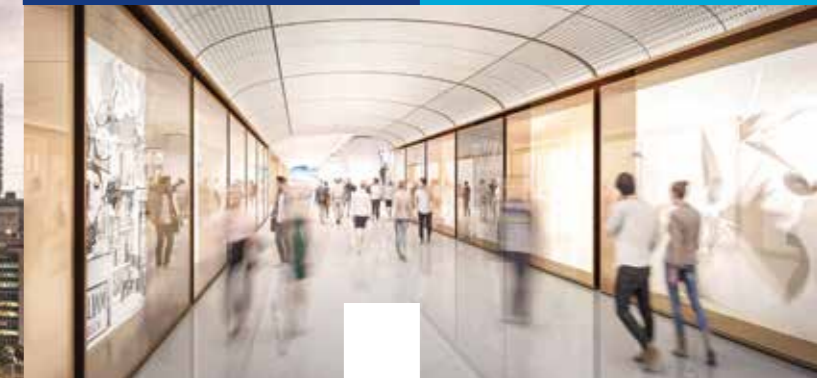
The NSW Government awarded Macquarie Group a \$378.6 million contract to deliver the largely underground station component of the new Martin Place metro station - including new underground pedestrian connections and improvements to the public domain.

As part of the first value-capture agreement on Sydney Metro, the NSW Government will receive \$355 million from Macquarie Group for the air rights above the new metro station and Macquarie will deliver new commercial buildings, pedestrian connections and retail space.



Click to play video

Transforming Martin Place



METRO  
MEANS



- From a public transport customer perspective, the physical station environment at Martin Place like the platforms and paid concourse area will meet the same high standards as all the new city metro stations. The metro station will be owned by the NSW Government.
- Customers will walk past a range of stores on their way to the train station. The integrated transport precinct design has been informed by New York's World Trade Centre station and Hong Kong's International Finance Centre.
- As the new Martin Place Station is built underground, the integrated station development will be able to be built above at the same time. This helps reduce community impacts, and allows for the buildings to be completed close to when Sydney Metro services start in 2024.
- Martin Place is one of five Sydney Metro stations that will be integrated with the areas around them, with planning also underway for developments at Crows Nest, Victoria Cross in North Sydney, Pitt Street and Waterloo.

# Connecting Sydney



Click to play video  
Future Transport 2056



The new spine of Sydney's public transport system, Sydney Metro will increase connectivity and accessibility, transforming Sydney into a place that is more liveable, connected and productive.

Faster travel times will bring more opportunities closer to more people - whether it's new jobs, better education options or recreation.

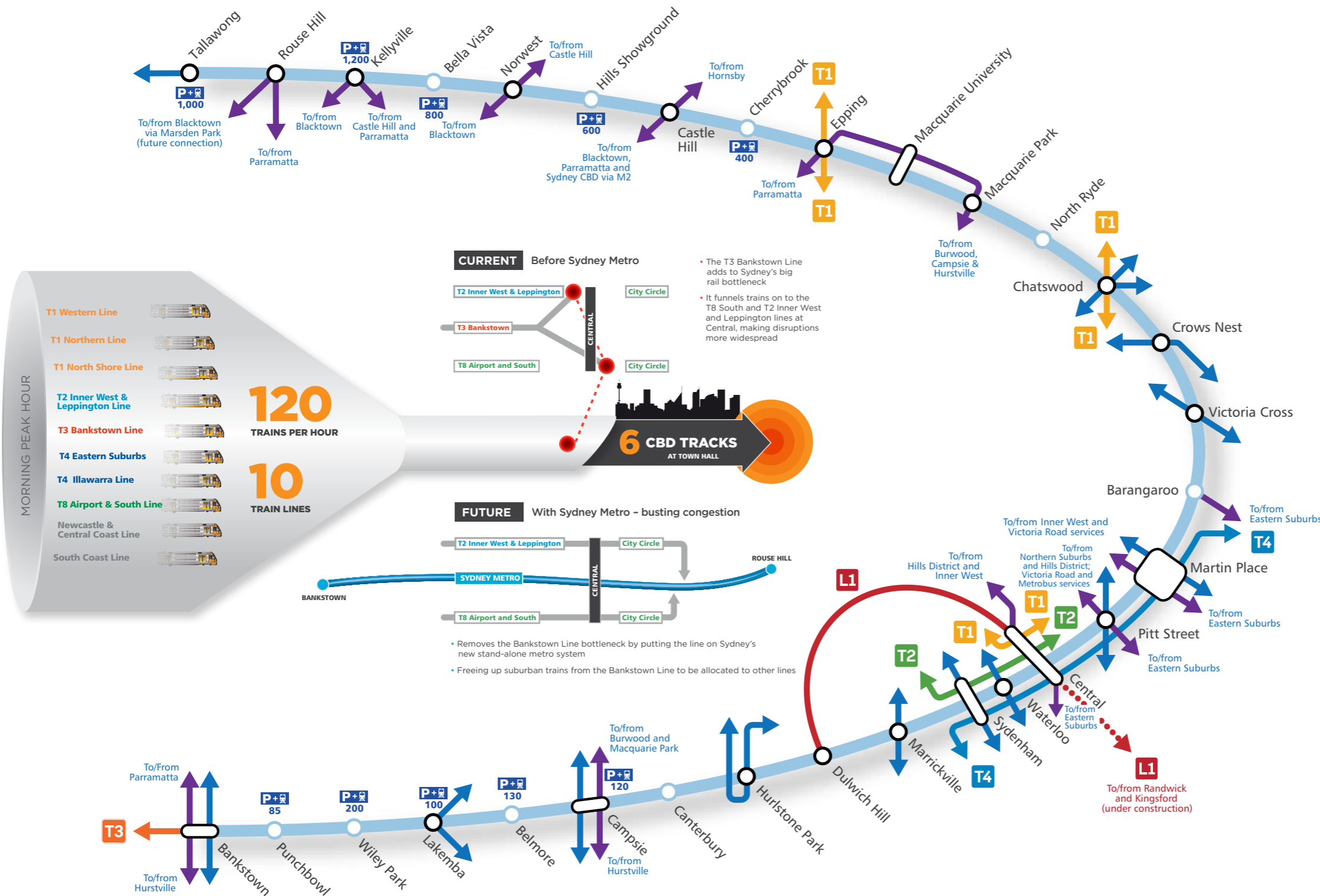
Interchanges with buses, trains, light rail and ferries will be seamless and have been designed to prioritise pedestrians, making the door-to-door journey for customers fast and easy.

The T3 Bankstown Line effectively slows down the Sydney Trains network because of the way it merges with other railway lines closer to the city.

Sydney Metro removes the Bankstown Line from the Sydney Trains network and places it on the stand-alone Sydney Metro system, with stations and systems upgraded to metro standards.

The suburban trains currently operating on the T3 Bankstown Line will be allocated to other Sydney railway lines.

Sydney Metro, together with signalling and infrastructure upgrades across the existing Sydney rail network, will increase the capacity of train services entering the Sydney CBD - from about 120 an hour today to up to 200 services beyond 2024. That's an increase of up to 60 per cent capacity across the network to meet demand.



Pictured right: Peter Holman and wife Anne-Marie Holman, after whose mother Nancy Bird Walton the first city tunnelling machine was named.



Sydney Metro's landmark railway bridge at Rouse Hill.



Roadheader tunnelling under Martin Place, August 2018.

# Delivering a **once-in-a-century** program



Click to play video  
A bridge to the future

## The 16 construction sites across Sydney's north west were just the beginning.

Delivering a new railway system in the middle of Australia's biggest city is a major - and complex - engineering task.

This world-scale infrastructure investment is coming to life through innovative - and evolving - delivery strategies put in place to ensure the goals and deadlines on the individual Sydney Metro projects are met.

Sydney Metro Northwest has been delivered through three major contracts - tunnelling, skytrain and operations, including trains - following industry feedback that the project scope was too large for one principal contractor.

The delivery strategy for Sydney Metro City & Southwest has been further refined following industry engagement, with a \$2.81 billion tunnelling contract awarded in June 2017.

A \$1.376 billion line-wide contract was awarded in November 2018 to deliver 31 kilometres of underground railway tracks and the expansion of the Sydney Metro Trains Facility at Rouse Hill to accommodate new trains.

The industry engagement process started on Sydney Metro West in mid-2017 and continued in 2018.

In 2019, there will be further community and industry engagement on the West and Western Sydney Airport metro lines.



# Delivery strategies

Working with industry has been a hallmark of Sydney Metro since 2011.

Consultation has helped define and refine Sydney Metro.

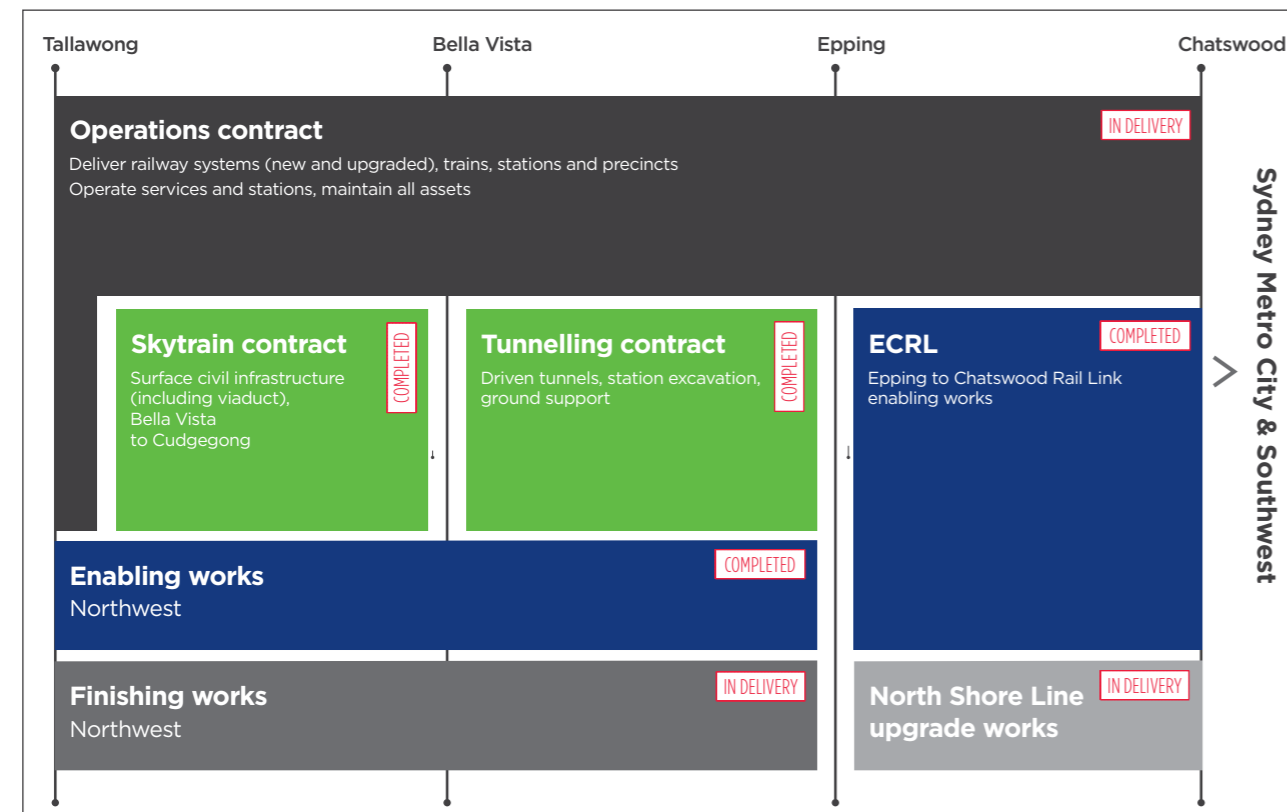
Harnessing industry expertise and world's best practice has helped Sydney Metro test, refine and optimise delivery – in parallel with the community consultation process.

This engagement process has maximised industry input at the early stages and helped ensure the desired outcome – an outstanding transport product that is value for money and puts the needs of the customer first.

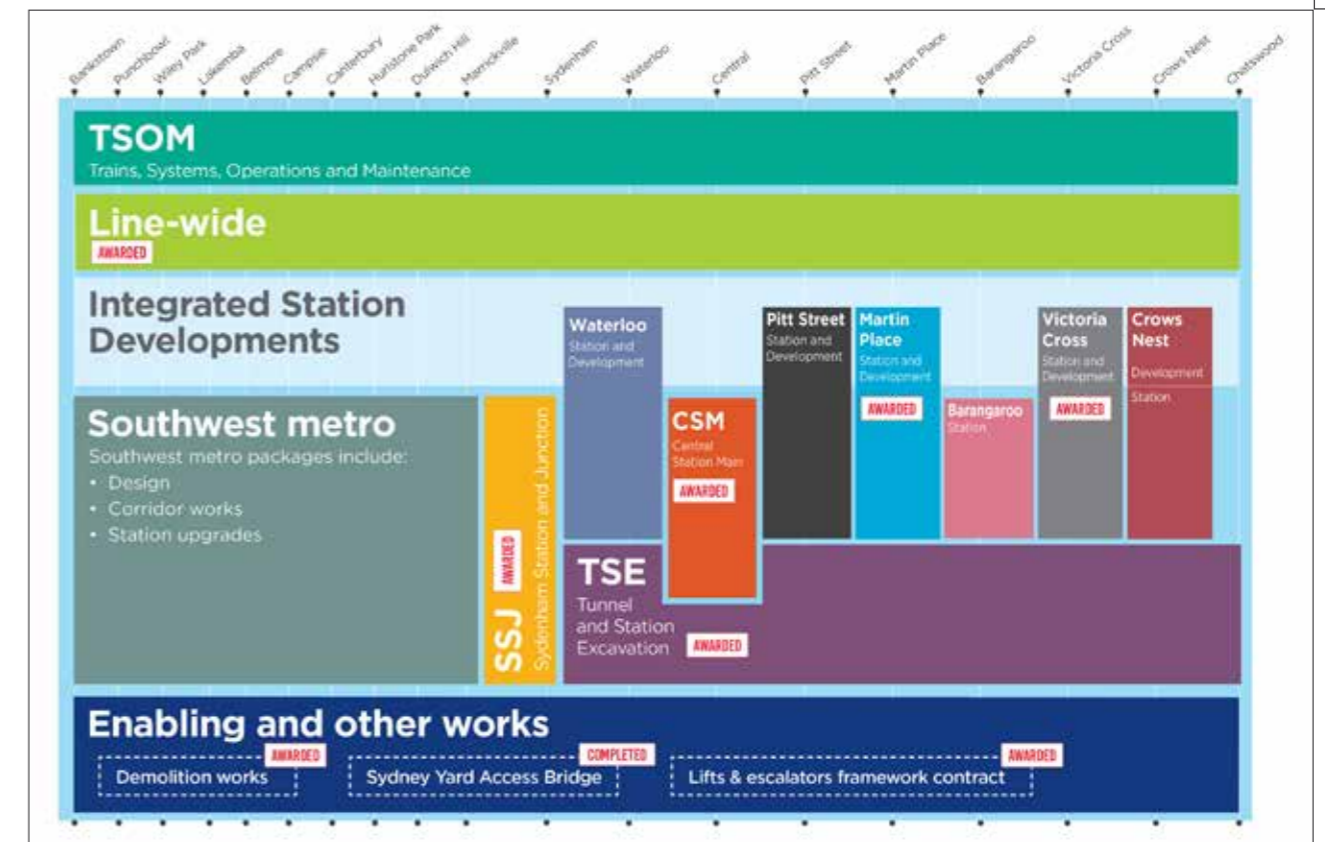
More than 3600 people from over 800 companies around Australia and across the world have attended eight major industry briefings since 2011.



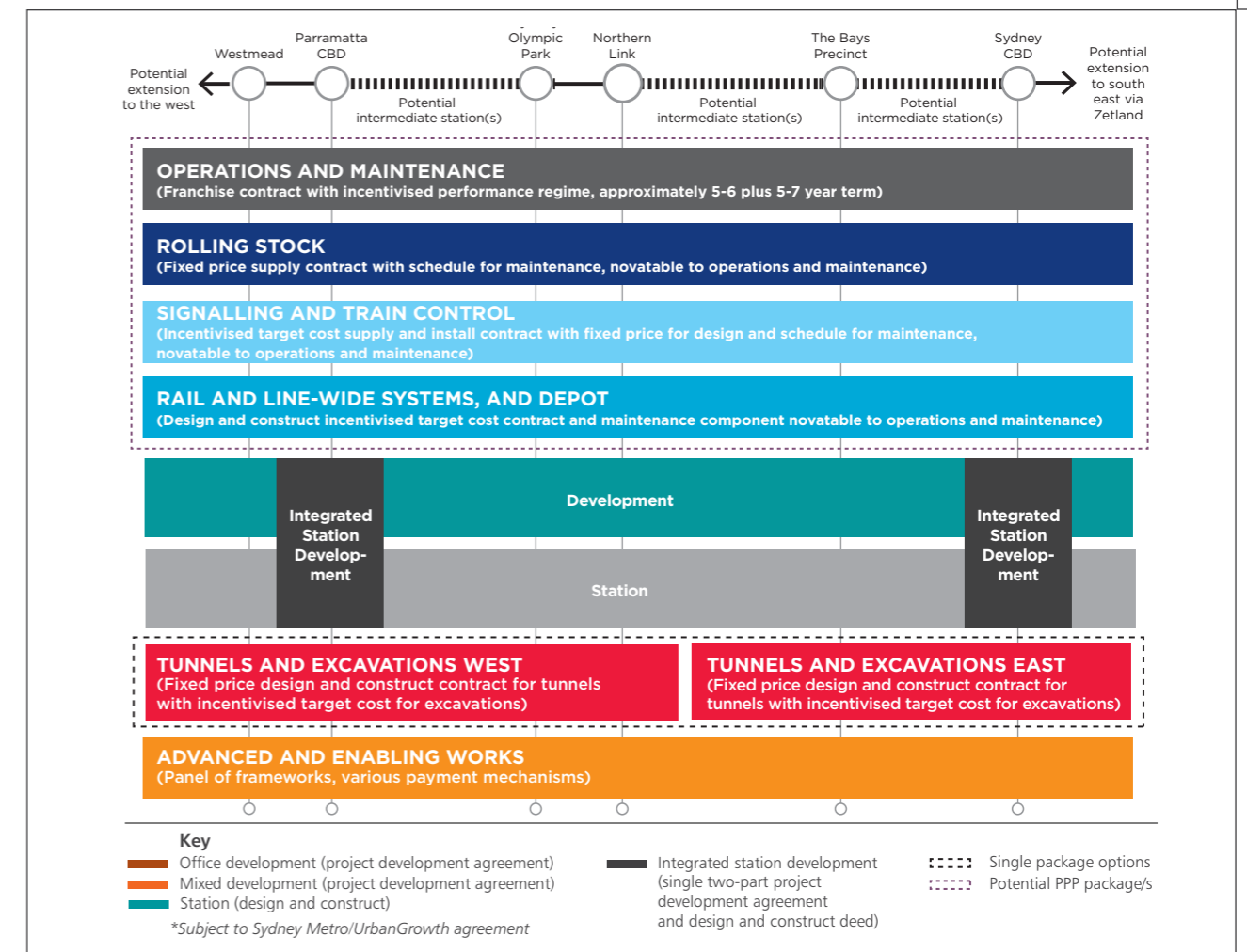
## Northwest



## City & Southwest



## West



# A journey deep under Sydney

## A new generation of tunnellers is helping deliver a once-in-a-century infrastructure investment for Sydney.

On Sydney Metro Northwest, Australia's longest railway tunnels were completed in January 2016 after 16 months of tunnelling - and then handed over to the next contractor 10 months early.

The twin 15-kilometre tunnels from Bella Vista to Epping were delivered by four mega tunnel boring machines (TBMs) - at that time, the most used in an Australian transport infrastructure project.

Sydney Metro City & Southwest will be delivered by five TBMs, and will break the record of longest rail tunnels.

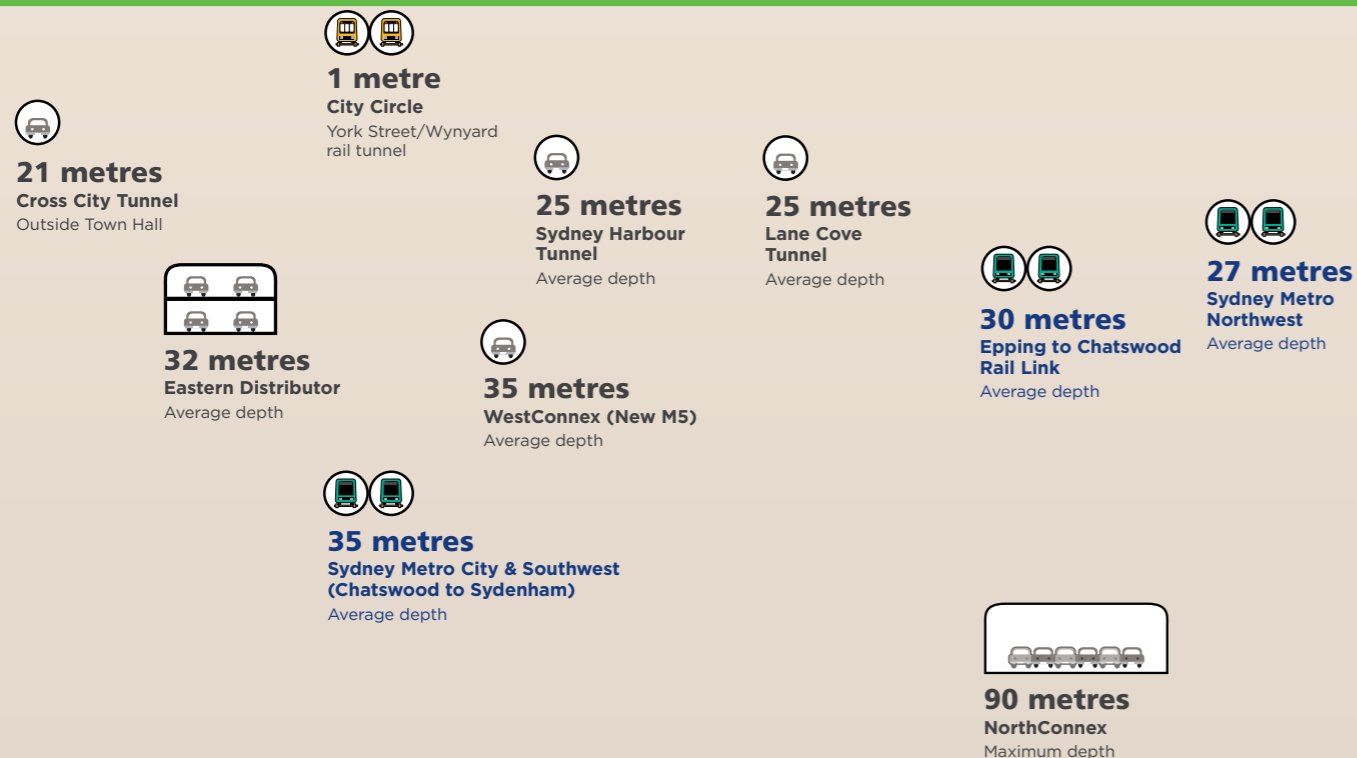
Tunnelling started to deliver twin new metro railway tunnels below the centre of Sydney and deep under Sydney Harbour in 2018. The first two of five mega borers were launched from Marrickville. The TBMs working on the City & Southwest project will build 31 kilometres of tunnels between Marrickville and Chatswood.

The project includes a specialised TBM for the Sydney Harbour crossing, due to the combination of sandstone, clay and sediments found during geotechnical drilling between North Sydney and the new metro station at Barangaroo.



Click to play video  
30 kilometres in three minutes

The first TBM to dig the city section of Sydney Metro has been named Nancy, after transport pioneer Nancy Bird Walton OBE.

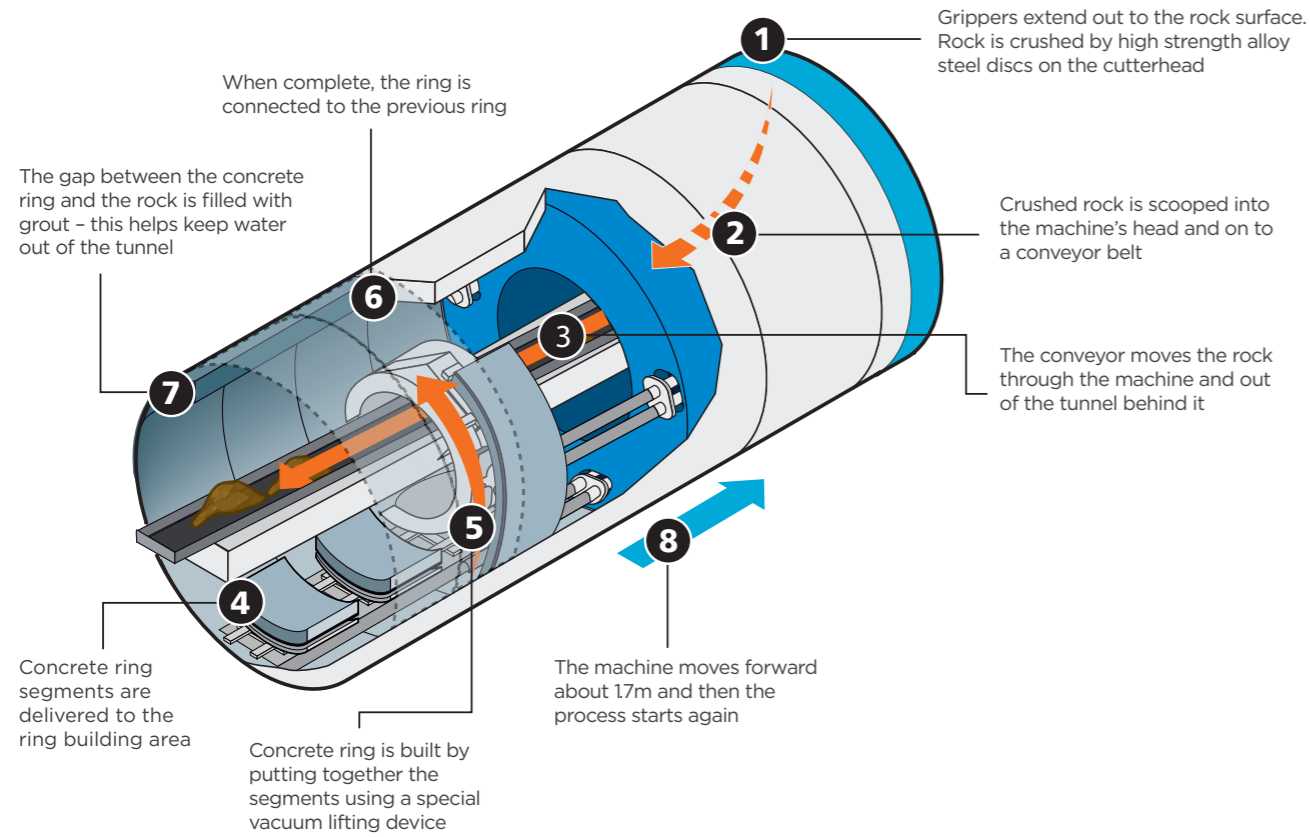


All 3.2 million tonnes of crushed rock from tunnelling on Sydney Metro Northwest were reused on the project or in developments across Greater Western Sydney, including Bunnings at Blacktown.





## How a tunnel boring machine (TBM) works



# A new generation of tunnelling

Tunnel boring machine (TBM) technology has advanced significantly in recent decades, allowing for the fast, safe and efficient delivery of Sydney Metro.

Four mega TBMs built the twin tunnels on Sydney Metro Northwest. This was the first time in Australian history that four TBMs were used on the one transport infrastructure project.

Five TBMs will be used to deliver the tunnels between Chatswood and Sydenham. This includes a specialised TBM for the section under Sydney Harbour because of the ground and rock conditions found at the bottom of the harbour.

Sydney Metro West is expected to be built largely underground and become operational in the second half of the 2020s.



### How big is it?

Length: up to 120m

### How heavy is it?

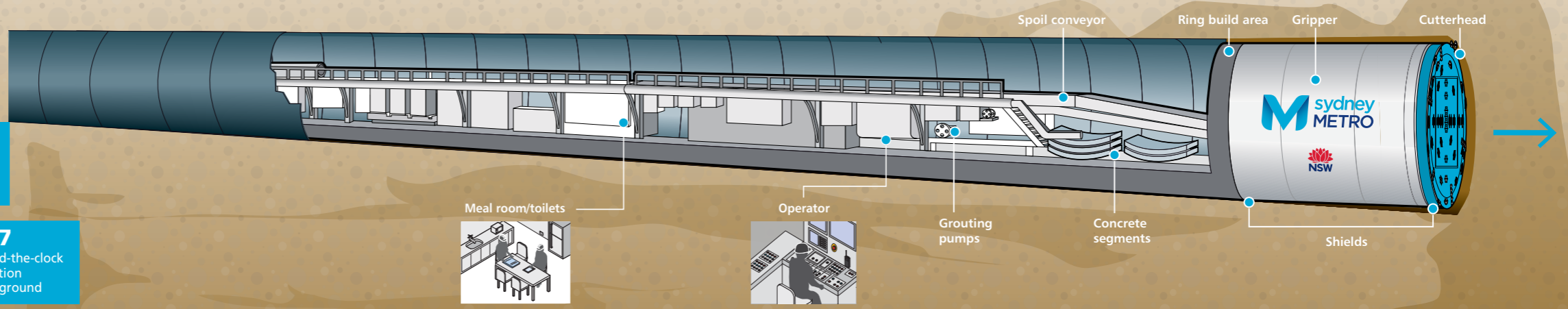
>900 tonnes weight

570 Holden Commodores

Sydney Metro's first TBM, Elizabeth, named after colonial pioneer Elizabeth Rouse, was launched on 8 September 2014 and tunnelled nine kilometres from Bella Vista to Epping, finishing on 1 December 2015.



- 83%** boring through Sydney sandstone, the rest shale
- 3** TBM launch sites
- 120m** of tunnel cut every week, on average
- 6m** internal tunnel diameter
- 99,200** concrete segments will line the tunnels
- 940** Olympic swimming pools or 2.8 million tonnes of crushed rock generated by tunnelling
- 15** people work on each TBM at any one time
- 24/7** around-the-clock operation underground



# Community and stakeholder engagement

Sydney Metro has worked with the community every step of the way since 2011, refining the program of works for better outcomes.

From the planning stage and into delivery, Sydney Metro has been constantly speaking with the community and taking on board their feedback – so the best projects possible can be delivered.

Ongoing consultation every step of the way has been a hallmark of Sydney Metro since the establishment of the first project team in 2011.

The projects have been refined and defined through community consultation. Following community and stakeholder feedback:

- Two new stations and 1000 commuter car spaces were added to Sydney Metro Northwest, while the future of the Castle Hill Showground was also secured.
- New stations at Crows Nest and Barangaroo were added to Sydney Metro City & Southwest, and a second entry added to Victoria Cross Station.

- On Sydney Metro West, the community was consulted in mid-2017 on proposed station locations between Parramatta and the Sydney CBD, with Westmead added as a key precinct to be serviced.

A community information centre was established in 2011 soon after the North West project was announced, and in late 2018 a community information centre was opened at Campsie.

Together with a mobile community information centre, the Sydney Metro team has met with more than 350,000 people across Sydney since 2011.



The Sydney Metro team has engaged with more than **350,000** people since 2011 right across Sydney.



**610,000** people across Australia watched Seven News' World's Best Metro documentary in July 2016.



More than **10,000** people have attended open days at construction sites since 2014.

More than **200,000** people have taken a tour through Sydney Metro's life size train model at the Sydney Royal Easter Show since 2016.



More than **11,000** students have taken part in the *FastTracking the Future* education program since 2014.



Click to play video  
*FastTracking the Future*



# A transformative legacy

## Delivering a high quality, integrated, connected and sustainable metro rail service.

On 1 July 2018 Sydney Metro was established as a NSW Government agency, cementing the legacy of a program of works which began in 2011 as the North West Rail Link project.

What started as an extension to the suburban railway system evolved in 2013 into a new 36-kilometre metro line in the city's north west; then further expanded in 2015 into a program of works which now includes four metro railway lines and more than 130 kilometres of new railway for Sydney.

The legislative framework behind Sydney Metro will support the delivery of the biggest urban rail infrastructure investment in Australian history and allow Sydney to get the maximum benefits well into the future from what will be one of the world's great railways.

Sydney Metro is owned by the NSW Government and is part of the Transport for NSW cluster.

Similar to transport organisations around the world, this new structure ensures Sydney Metro can be effectively delivered and integrated with the communities and places around it – and that the customer is always at the centre of our operations.

Sydney Metro has formal responsibility for delivering great places around metro stations so that precincts are designed, developed, activated and delivered in alignment with the metro system to ensure the best outcomes for customers and communities.

As a centre of excellence, Sydney Metro is using the experience gathered since 2011 to deliver a world-class mass transit system which will grow with Sydney for generations to come.

Below: Canopy installation at Hills Showground, October 2018.



METRO  
MEANS

## A fast track to the future

- Sydney Metro's award-winning education program, *FastTracking the Future*, was launched in March 2014.
- The education program allows teachers to use a major infrastructure project in their community as a real-life teaching tool which students are able to easily relate to.
- The program was created by teachers and educators and was written with links to current syllabuses. It's modelled on other similar education programs, including for the Snowy Mountains Hydro Electric Scheme.
- The 380-page program is freely available to any school via the Sydney Metro website and has more than 130 classroom-ready lessons for primary and secondary teachers for years K-10.
- By mid-2017, more than 8300 students had taken part in the program. *FastTracking the Future* won the Planning Institute of Australia (NSW) Promotion of Planning Award in November 2014.

### First look at new metro stations

Sydney got its first look at the city's new metro stations in late 2018 at a series of community days in the north west.

More than 2000 people visited Tallawong, Bella Vista and Norwest stations, with nearby residents and future customers getting the first glimpse of cutting-edge customer technology like platform screen doors.

The series of community days were delivered by Sydney Metro in conjunction with Sydney Metro Northwest builder Northwest Rapid Transit and the operator of the new railway, Metro Trains Sydney.



Click to play video  
Norwest Station  
community day



# Colonial history uncovered

## City's transport past found while building Sydney's transport future.

A 180-year-old timber boat was uncovered during excavation works at Barangaroo Station – the oldest boat of its kind ever found in NSW.

Archaeologists believe the boat was built in the 1830s and is the oldest known example in NSW of an Australian-built small European-style timber boat that once moved around the Sydney colony.

The wreck of the wooden boat is nine metres long, three metres wide and at least one metre deep.

Wood samples have revealed it is made from Sydney Blue Gum, Stringybark and Spotted Gum, which would have been sourced in the Sydney basin.

It was built using the clinker technique, where the planks that make up the hull overlap and are held together with small iron fastenings and possibly tree nails.

The boat was found on a small area of beach which formed between the Cuthbert's shipyard (1850s) and remnants of Langford's privately built wharf. The beach was used to store old boats to recycle or reuse them.

An 1850s seawall made of stone blocks was also found nearby, and it's likely the boat was buried in the sand some time before the seawall was built.

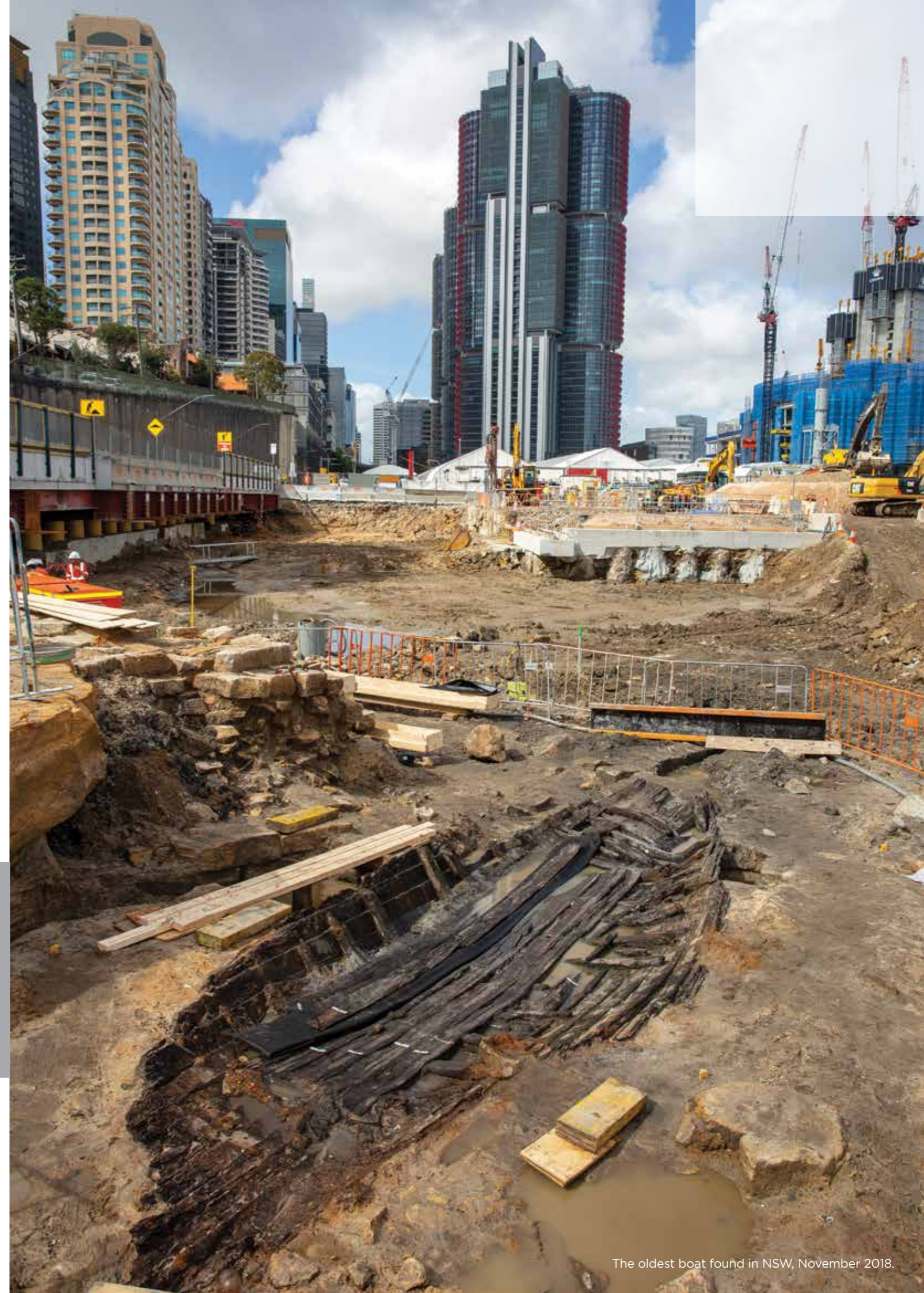
Conservation specialists, engineers, maritime archaeologists and the NSW Office of Environment and Heritage have been working together to plan the best way to try to retrieve the boat in one piece.



Left: Descendants of William Langford inspect the boat discovery.



Click to play video  
Our oldest boat



The oldest boat found in NSW, November 2018.

# Appendix

## Sydney Metro makes it easier for customers at every step of their journey.

### Door to door:

1. Origin
2. Travel to Metro
3. Interchange and precinct
4. The station
5. On board the Metro
6. The station
7. Precinct and interchange
8. Travel from Metro
9. Destination

## Key Sydney Metro facts

- Stage 1 – Sydney Metro Northwest opens in 2019
- Stage 2 – Sydney Metro City and Southwest opens in 2024
- 66 kilometres of new metro rail for Sydney
- 31 state-of-the-art, fully accessible metro stations
- 98 percent on time running reliability
- A train every four minutes in the peak
- A train every 10 minutes in the off peak
- Continuous mobile phone coverage through the network
- No timetable – customers will just turn up and go
- Opal Ticketing

### Train features

- Three double doors per carriage for faster loading and unloading
- Level access between platform and train
- Two multi-purpose areas per train for prams, luggage and bicycles

- Wheelchair spaces, separate priority seating and emergency intercoms
- Real-time travel information and live electronic route maps
- Platform screen doors keep people and objects away from the edge and allow trains to get in and out of stations much faster
- Inside you can see from one end of the train to the other
- Heating and air conditioning
- 170 metres long platforms – longer than most of Sydney
- Customer service assistants at every station and moving through the network during the day and night

### Safety

- Sydney Metro is Australia's first fully-automated metro rail network. Around the world, millions of people use these networks every day in cities like Paris, Singapore, Dubai and Hong Kong

### Operations Control Centre

- State-of-the-art network controlled from new high-tech facility at Tallawong Road
- Constant monitoring – Expert train controllers monitor entire metro system
- Security – More than 230 tunnel cameras on Sydney Metro Northwest alone
- Signalling and communication systems – Control the trains, tunnels, platforms and skytrain to deliver a safe and reliable journey
- Faster journeys – System minimises the time trains are stopped at stations and the time between each train

## Sydney Metro City & Southwest is under construction. Stations include:

- Chatswood
- Crows Nest
- Victoria Cross
- Barangaroo
- Martin Place
- Pitt Street
- Central
- Waterloo
- Sydenham
- Bankstown

## Sydney's Rail Congestion

### Sydney's current rail system was built over 160 years. There are 120 trains per hour on 15 lines, all coming together on 6 CBD train tracks.

- The Bankstown Line adds to Sydney's big rail bottleneck
- It funnels trains on to the East Hills and Inner West lines outside Central
- Queuing trains make delays worse, causing backlogs in the west and south west

### In the future Sydney Metro will help by busting congestion.

- Removes the Bankstown Line bottleneck by putting the line on Sydney's new stand-alone metro system
- Suburban trains from the Bankstown Line allocated to other lines
- Clearing the funnel means more trains and more reliable services

## How a tunnel boring machine works

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

2. Crushed rock is scooped into the machine's head and on to a conveyor belt
3. Conveyor moves rock through the machine and out of the tunnel behind it
4. Concrete ring segments are delivered to the ring building area
5. Concrete ring is built by putting together the segments using a special vacuum lifting device
6. When complete, the ring is connected to the previous ring
7. The gap between the concrete ring and the rock is filled with grout – this helps keep water out of the tunnel
8. The machine moves forward about 1.7 metres then the process starts again

## Tunnel boring machines on the Sydney Metro project.

- 83% boring through Sydney sandstone, the rest shale
- Three TBM launch sites
- 120 metres of tunnel cut every week, on average
- Six metres is the internal tunnel diameter
- 99,200 concrete segments will line the tunnels
- 940 Olympic swimming pools or 2.8 million tonnes of crushed rock generated by tunnelling
- 15 people work on each TBM at any one time
- 24/7 around-the-clock operation underground

### The parts of the TBM include:

- Meal room/toilets
- Operator
- Grouting pumps
- Spoil conveyer
- Concrete segments
- Ring build area
- Gripper
- Shields
- Cutterhead



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