



# Transforming Sydney







# Australia's biggest public transport project

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



# Transforming Sydney

## Program overview

Sydney Metro is a NSW Government agency delivering and operating Sydney's new metro railway system.

As a part of the Transport for NSW cluster, the customer is at the centre of everything we do.

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

A centre of excellence, Sydney Metro is delivering a world-class mass transit system which will grow with Sydney for generations to come.

Transforming Sydney outlines Sydney Metro's projects, strategic goals and milestones in the delivery of Australia's biggest program of public transport infrastructure.

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

# Delivering tomorrow's Sydney



Sydney Metro, Australia's most advanced rail system entered its second year of service in 2020.

Sydney Metro has delivered a level of customer experience

not seen before in Australia: a fully accessible turn-up-and-go metro that will forever change how we move around our great city.

The opening of the North West Metro in 2019 marks the start of our metro network.

A new generation of fast, safe and reliable metro trains has changed the way of life for the people in the north west, delivering mass transit to the region.

The network is growing with the second harbour rail-crossing, from Chatswood to Bankstown in the south west; the western metro from the City to Greater Parramatta; and the new north-south line supporting Western Sydney International (Nancy-Bird Walton) Airport.

Join us on a journey that is transforming Sydney.

**Gladys Berejiklian MP**

Premier of New South Wales



Metro means many things for Sydney: a new way of travel, a world-class 21st-century mass transit system – and a way to change lives for the better.

With the opening of Sydney Metro in 2019, public transport took its biggest leap in decades.

And the best is yet to come.

The new metro line through the heart of Sydney will transform Australia's only global city when it opens in 2024, while the Sydney Metro West project linking the Greater Parramatta and Sydney CBDs is a once-in-a-century city shaping infrastructure investment. The Sydney Metro – Western Sydney Airport project will become the transport spine for greater Western Sydney.

These world-scale projects are backed by a proven commitment to many firsts – Australia's first driverless railway, full accessibility and world-class safety benefits like platform screen doors.

All centred on our customers.

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

**Andrew Constance MP**

Minister for Transport and Roads



Scan to view  
**Sydney Metro update**



Scan to view  
Historic crossing

# Shaping Sydney's future

Revolutionising how we travel.

Sydney Metro opened on 26 May 2019.

The Metro North West Line, Australia's first fully-automated driverless railway, was delivered on time and \$1 billion under its \$8.3 billion 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.

By the end of 2019, more than 75,000 customers were using the service on an average weekday.

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 - keeps people and objects away from the tracks, also allowing trains to get in and out of stations faster.

All Sydney Metro stations are fully accessible - with lifts and level access between platforms and trains, making it easier for more customers to use public transport.

From the city's 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 stand-alone metro railway system. There will be capacity for a metro train every two minutes in each direction under the Sydney city centre.



Tunnel boring machine (TBM) Kathleen being barged back to Barangaroo after completing the first under-harbour metro tunnel, November 2019.

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 is being extended to Western Sydney. The new Sydney Metro West project will connect the Sydney central business district (CBD) 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 International (Nancy-Bird Walton) Airport, linking it with the rest of Sydney. The Australian and NSW governments are equal partners in the delivery of the Sydney Metro - Western Sydney Airport project. It is due to open when the airport opens for passenger services.

Sydney Metro is developing and delivering metro railways and managing their operations.

As a NSW Government agency, it 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 infrastructure investment in Australian history

## Metro North West Line

Opened 26 May 2019



13 stations



4000 commuter car parks



36 kilometres

## City & Southwest project

Opening 2024



18 stations



New CBD connections



30 kilometres, including under Sydney Harbour

## West project

(final alignment to be confirmed)



Nine stations



25-kilometre metro line connecting Greater Parramatta and the Sydney CBD



Western Sydney population, 2036

## Western Sydney Airport project

(final alignment to be confirmed)



Six stations



Connecting Western Sydney International Airport to the rest of Sydney



23 Kilometres



 Sydney Trains suburban network

 Proposed future metro lines





Scan to view  
Day 1 Live

# New opportunities

Supporting jobs, boosting economic growth.

Sydney Metro brings wide economic benefits to a global city, transforming places and making it more liveable and connected.

Global Sydney's population will pass six 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.

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

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.

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.

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.



Turn-up-and-go services changing how we get around Sydney.



An artist's impression of the Parramatta metro station.



# A metropolis of three cities

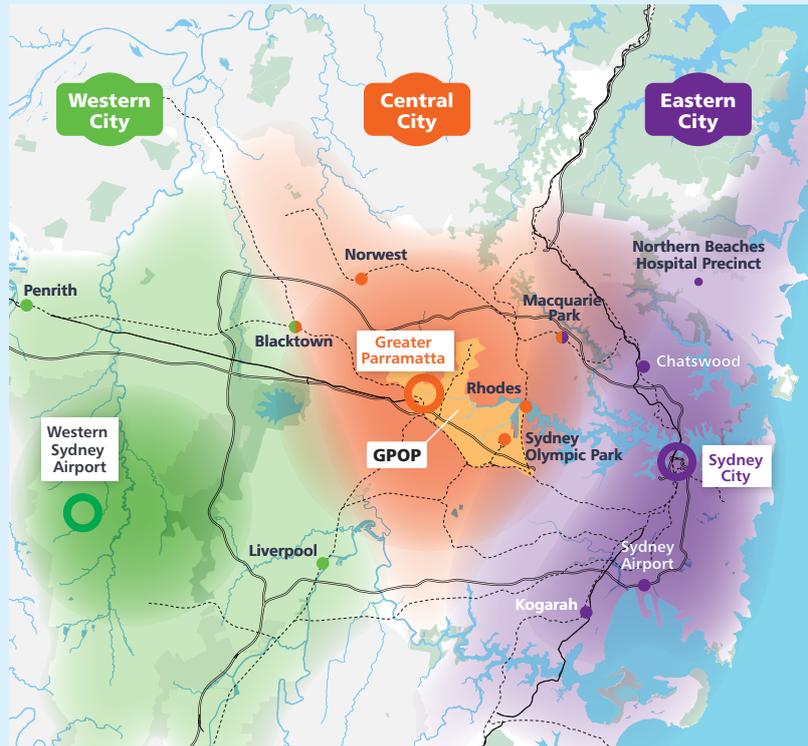
The Greater Sydney Commission's *Towards our Greater Sydney 2056* outlines how the city is planning for future decades.

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 reimagine 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.



## 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.



# 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.

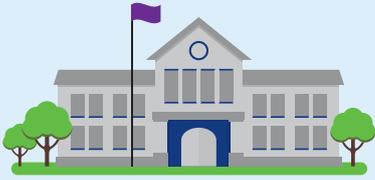
Metro stations provide safe and efficient interchange between transport modes, giving priority to pedestrians.



# The customer experience

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

Customers connected to real-time journey information on trains.



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



Ultimate capacity for a new metro train every two minutes.



Customer service attendants through the system. All trains air-conditioned. New technology like video help points.



No timetable - just turn up and go.



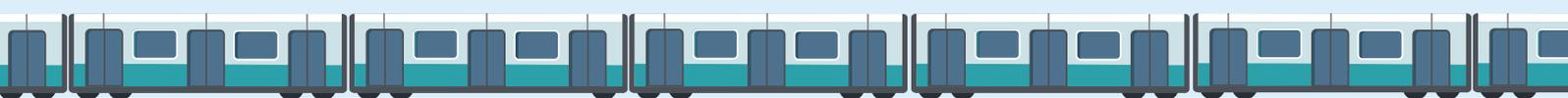
New precincts create vibrant new places. Safe and efficient interchange between transport modes.



Fully accessible.



**Door-to-door approach**  
Getting our customers to work, meetings, school, sport, or a day out and of course, home.





# Supporting communities

New opportunities,  
a customised strategy.

Sydney's new mass transit system is integrated into active precincts around each metro station.

Sydney Metro integrates with new communities and transforms existing urban centres, cutting travel times, reducing congestion and delivering major economic and social benefits for generations to come.

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

The cornerstone strategy for the optimal development and activation of precincts:

- › supports the NSW Government's planning strategies and objectives to maximise urban outcomes
- › enhances customer experience and urban amenity
- › creates an urban environment that drives high usage of new metro rail
- › ensures station precincts are activated as soon as possible following completion of the metro infrastructure.

Sydney Metro's customised strategy to deliver great places brings together international best practice and innovative urban thinking to shape vibrant and attractive places in the precincts around stations.



Kellyville Station has 1,360 commuter car spaces.

## Future Transport 2056

The NSW Government's Future Transport 2056 strategy, focuses 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)



### Supporting renewal

New development opportunities within existing centres



### Precinct development

Adjacent to metro stations within existing centres



### New communities

Vibrant places centred around metro station locations



### Integrated station and precinct developments

Opportunities integrated with new stations at existing commercial centres



Scan to view  
Transforming places

# Creating world-class places

Integrated station and precinct developments shaping the city's future.

Joining other great global mass transit development initiatives, the NSW Government has identified stations on the Sydney Metro system which can be better integrated with the areas around them, delivering precincts that are thriving, welcoming hubs for everyone to enjoy.

An integrated station and precinct development (ISD) 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 spaces, shops, restaurants and commercial office spaces.

Integrated station developments (ISDs) are built at the same time as the station. This helps reduce the community impacts and allows for the development to be completed close to when services start.

These developments will deliver new stations combined with commercial buildings, homes, community facilities, retail space and better pedestrian connections.

Creating a new international standard of place, Sydney Metro is adopting global best practice and innovative thinking, with specialist design teams drawing inspiration from some of the most memorable city-shaping projects including Crossrail in London and Hudson Yards in New York.

As part of value-capture agreements on the ISDs, the NSW Government receives revenue from the air rights for the developments above the stations. The stations are delivered to the same high standard as all other metro stations and owned by the NSW Government.



In late 2018 and 2019, ISD contracts were awarded for Victoria Cross Station in North Sydney, and Waterloo Station and Pitt Street Station in the Sydney CBD.

Construction work started on the delivery of Martin Place ISD, which was awarded in 2018 and was Sydney's first ISD. Its design was informed by New York's World Trade Centre and Hong Kong's International Finance Centre.

Excavation work at Martin Place is now completed to 30 metres below ground, in preparation for construction of the ISD.

In late 2020, Sydney Metro also received planning approval for the amended concept design of three new buildings above Crows Nest metro station. The original concept design was amended as a result



From far left clockwise:  
 Artist's impressions of  
 Pitt Street, and Waterloo ISDs.



of community feedback received. Key changes as a result of community feedback included a reduction in building height and a 20 per cent reduction in the overall building envelope. The amended concept design will create new housing and employment opportunities across the three buildings, which will range from nine to 21 storeys.

On the Sydney Metro West project provisions have been made for potential integrated station developments at Parramatta, Sydney Olympic Park, The Bays, Pyrmont and Sydney CBD repetition. Precinct development opportunities are also planned at Westmead, Burwood North and Five Dock to complement the station precinct.

**These opportunities bring a new international standard of place.**

Vibrant neighbourhoods help strengthen communities, attract investment and enhance liveability.

Supporting and developing local communities through place making, Sydney Metro stations are more than somewhere to catch the train; they are the centre of communities with a variety of uses.





Scan to view  
Work starts  
at Central

# Revitalising Central Station

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

A new underground concourse from Chalmers Street, Central Walk 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.



Major construction work has started at Central, to deliver Sydney Metro services here by 2024.

# New operations contract

A seamless end-to-end experience from Tallawong to Bankstown.

A contract package was awarded in November 2019 to extend and operate the Metro North West Line beyond Chatswood, into the city centre and on to Bankstown.

It included an order for 23 new metro trains.

Sydney Metro exercised a pre-agreed extension to the existing Northwest Rapid Transit (NRT) Public Private Partnership (PPP) contract, which was awarded in 2014 for the operation of the Metro North West Line.

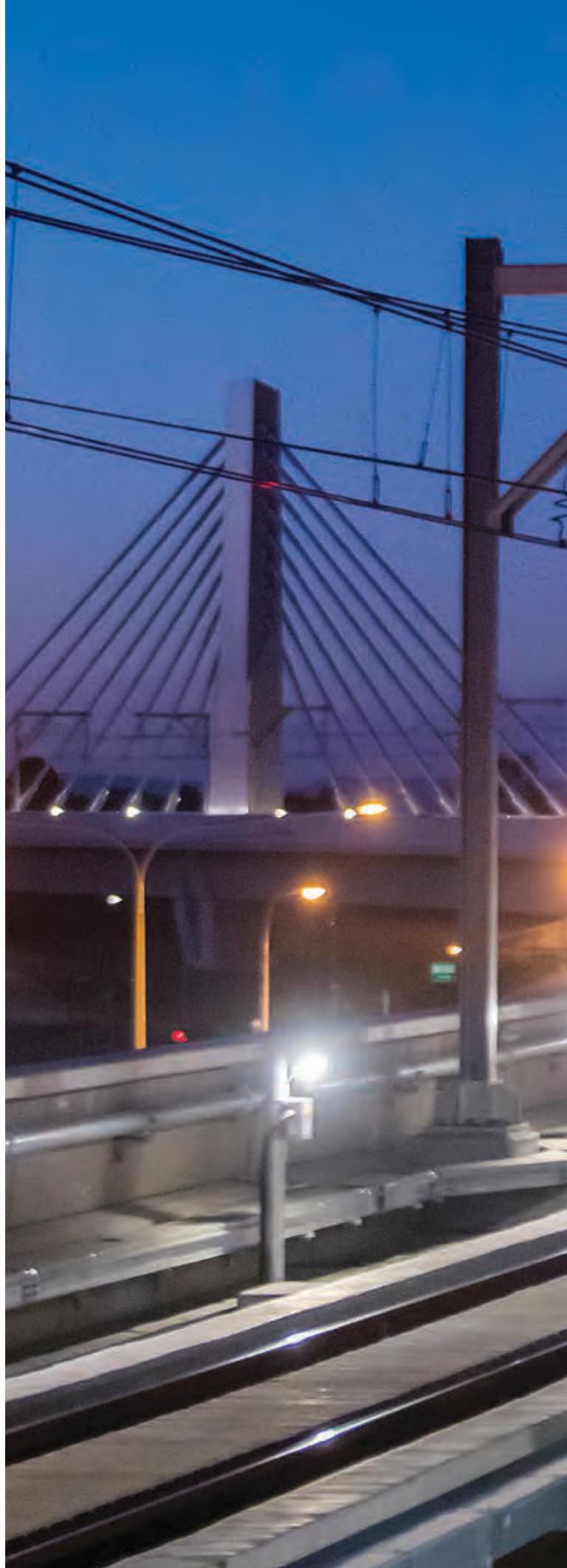
The contract has been extended to deliver a seamless customer experience on the new metro, with NRT to operate and maintain the full metro line from Rouse Hill to Bankstown - in total 66-kilometres of rail and 31 metro stations.

The NSW Government will own all the metro rail infrastructure, including the stations, tracks and trains.

The contract package includes \$1.7 billion for new metro trains and core rail systems as well as a \$2 billion operations and maintenance component for NRT to operate the combined North West and City & Southwest lines for a period of 15 years, until 2034.

Metro Trains Sydney, the railway operator appointed by NRT, will operate the metro railway in accordance with operational requirements set by Sydney Metro.

The original Operations, Trains and Systems PPP contract for the Metro North West Line was set up in 2014 specifically to allow it to be varied, so that any future changes and expansion to the line could be accommodated. The contract also allows it to operate as one integrated line despite procurement occurring under different contracts and several years apart.

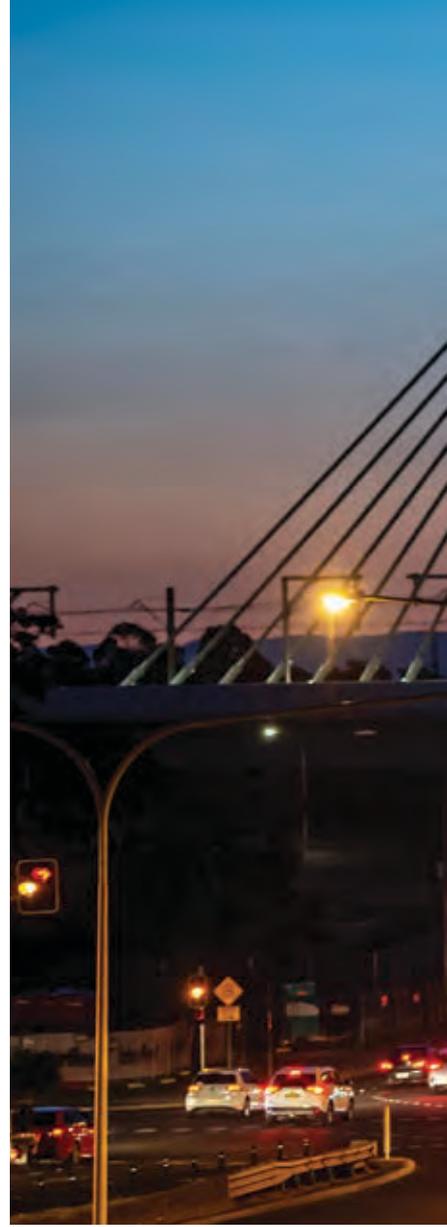






Scan to view  
Picture gallery

Clockwise from top right:  
Windsor Road railway bridge at  
Rouse Hill; Australia's first railway to  
use platform screen doors;  
Bella Vista station; Construction underway  
at Martin Place Station; The final concrete  
tunnelling segments headed over  
Sydney Harbour Bridge.





# North West

Sydney's first metro railway, the Metro North West Line, opened on 26 May 2019.

The project, announced in 2011 and known as Sydney Metro Northwest during construction, was delivered on time and \$1 billion under its \$8 billion budget.

The 36-kilometre line includes eight new metro stations, five upgraded stations and 4,000 commuter car parking spaces.

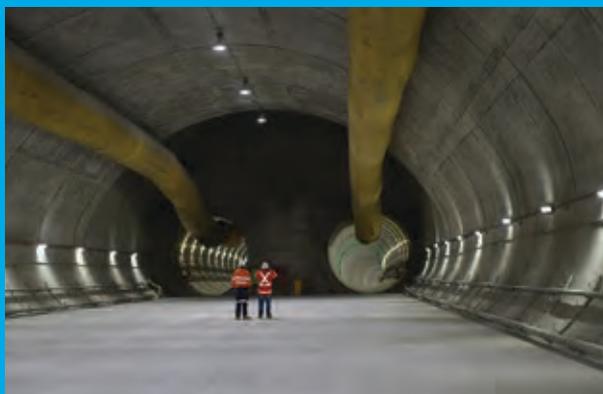
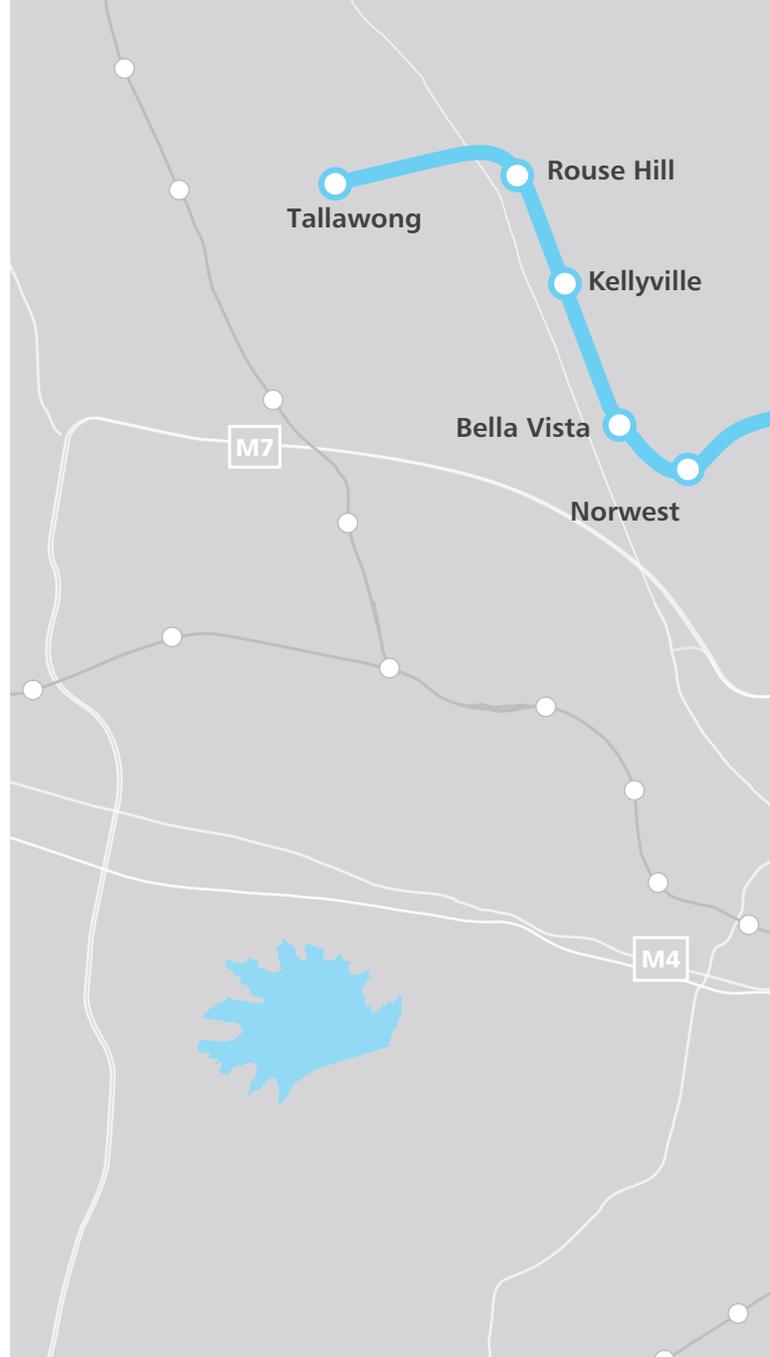
A fleet of 22 driverless metro trains operate every four minutes in the peak in each direction.

In 2019, the line carried 14.4 million customers on more than 60,000 services.

The trains had completed more than 2.3 million kilometres of service by the end of 2019.

The new line is the first reliable public transport service in a region with the highest private car ownership level in Australia.

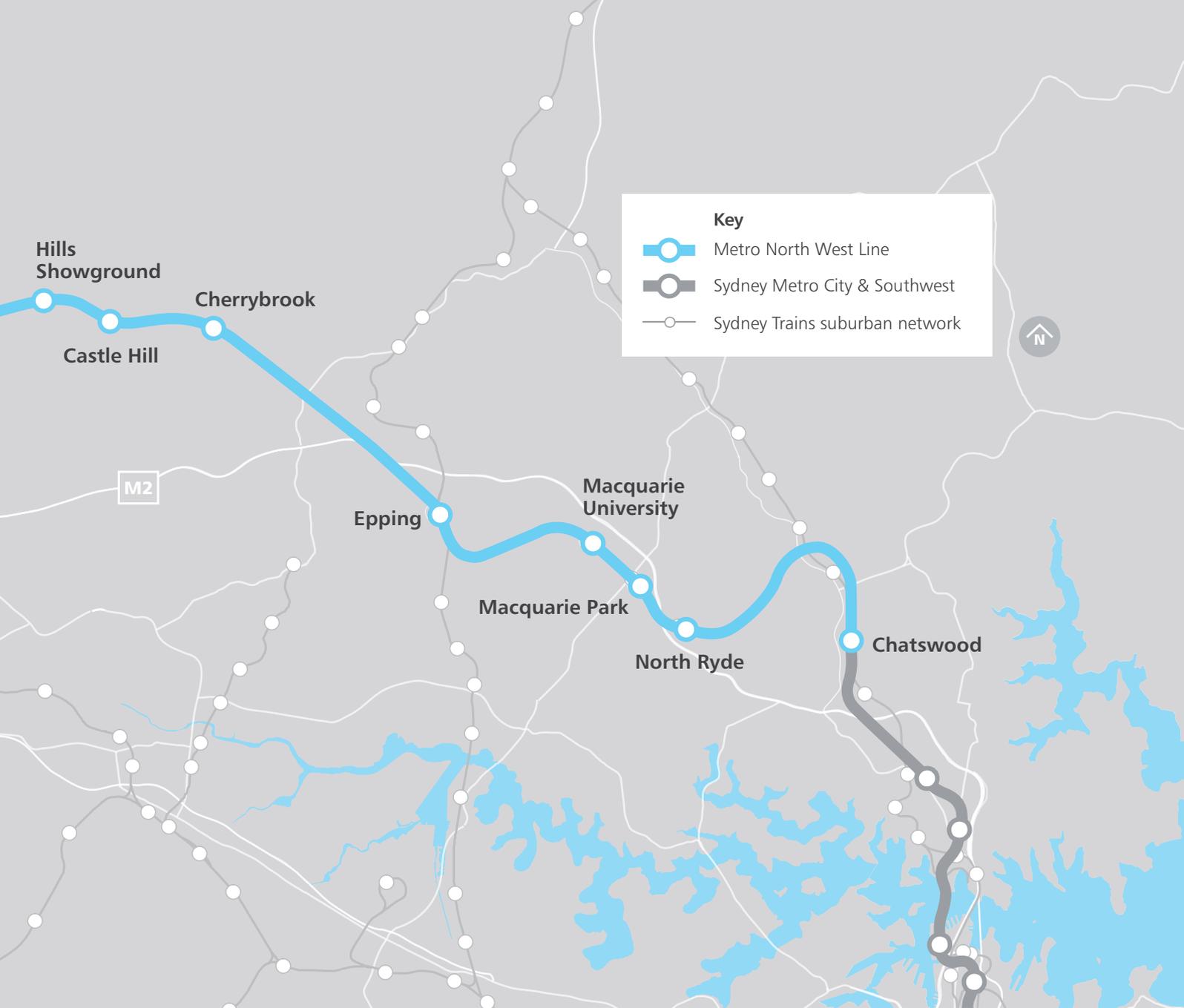
Over coming decades, an extra 200,000 people will move into Sydney's north west, taking its population above 600,000, or twice the size of Canberra.



Twin 15-kilometre railway tunnels, Australia's longest at the time of their construction, run from Bella Vista to Epping and include this cavern at Castle Hill.



The four-kilometre skytrain viaduct runs from Bella Vista to Rouse Hill and takes the new metro line above the north west, keeping communities connected.



A 270-metre curved cable-stayed bridge at Rouse Hill is the first of its type in Australia and was named global project of the year by US-based Engineering News-Record for its elegant, innovative and sustainable design.



The Sydney Metro Trains Facility at Rouse Hill is the operational headquarters for Sydney Metro and includes train stabling, maintenance facilities and the Operations Control Centre.

# City & Southwest

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

New CBD stations are being delivered at Barangaroo, Martin Place, Pitt Street and Central, taking the pressure off Town Hall and Wynyard stations.

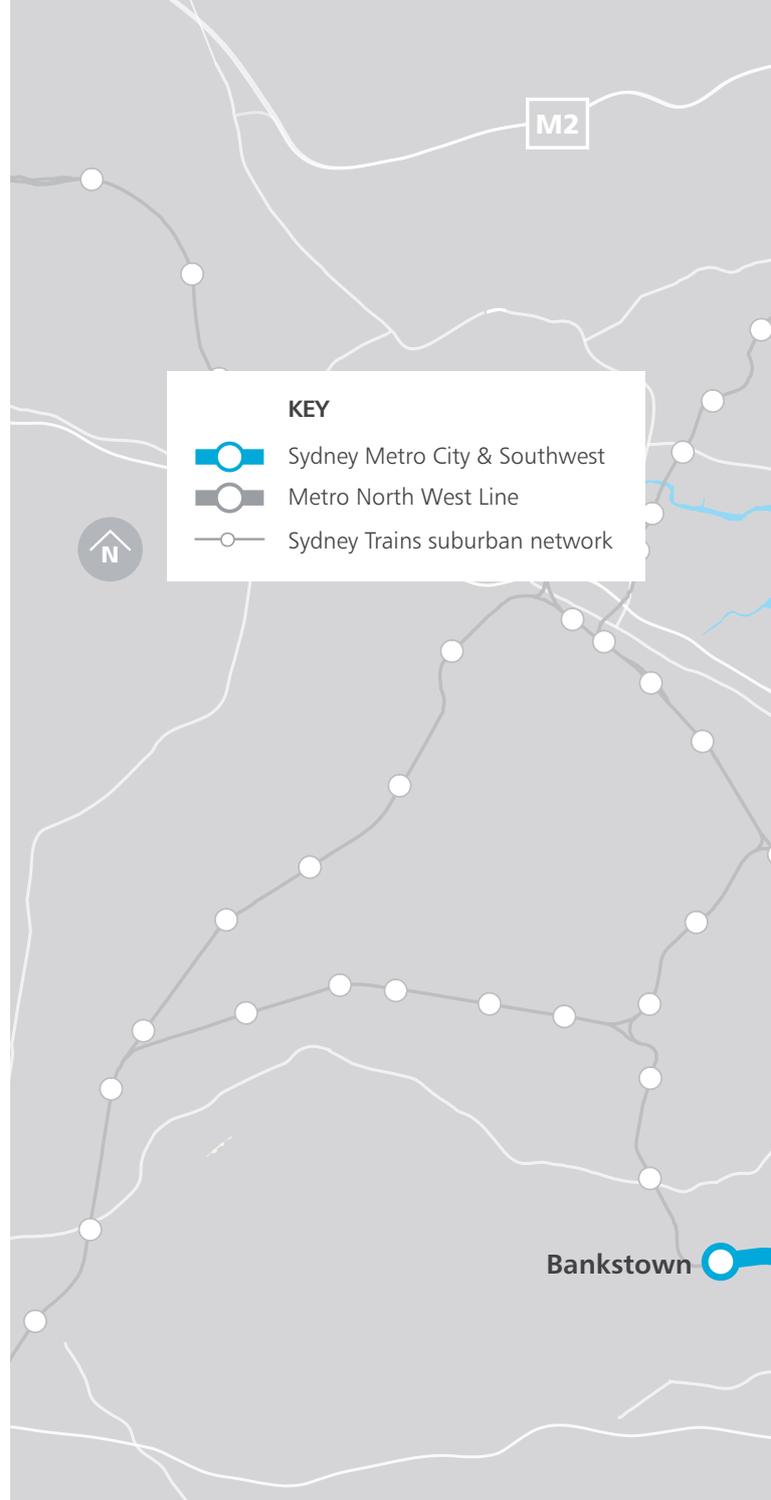
Services start in 2024, when Sydney will have 31 metro stations and a 66-kilometre stand-alone metro railway system.

The T3 Bankstown Line between Sydenham and Bankstown is being upgraded to metro rail standards.

The 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.

The opening service frequency of 15 trains an hour at all stations during the peak is a major boost to train services for customers on the Bankstown Line. Currently, stations like Hurlstone Park and Canterbury are serviced by as few as four trains an hour in the peak.

Upgrading the 125-year-old 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.



Tunnelling under the centre of Sydney finished in January 2020 when Mum Shirl, the last of four TBMs, arrived at Barangaroo.



Fitting out the tunnels began in mid-2020, with the first tracks being laid in January 2021 at Chatswood.



The biggest upgrade to Central Station in decades includes an updated northern concourse and escalators directly to suburban platforms 12 to 23 for the first time.



As part of Southwest Metro, there will be lifts for the first time at Dulwich Hill, Hurlstone Park, Canterbury, Wiley Park and Punchbowl stations.

# West

New underground metro rail will become the fastest, easiest and most reliable journey between Greater Parramatta and the Sydney CBD.

The Sydney Metro West project has set a target travel time of around 20 minutes between the two CBDs.

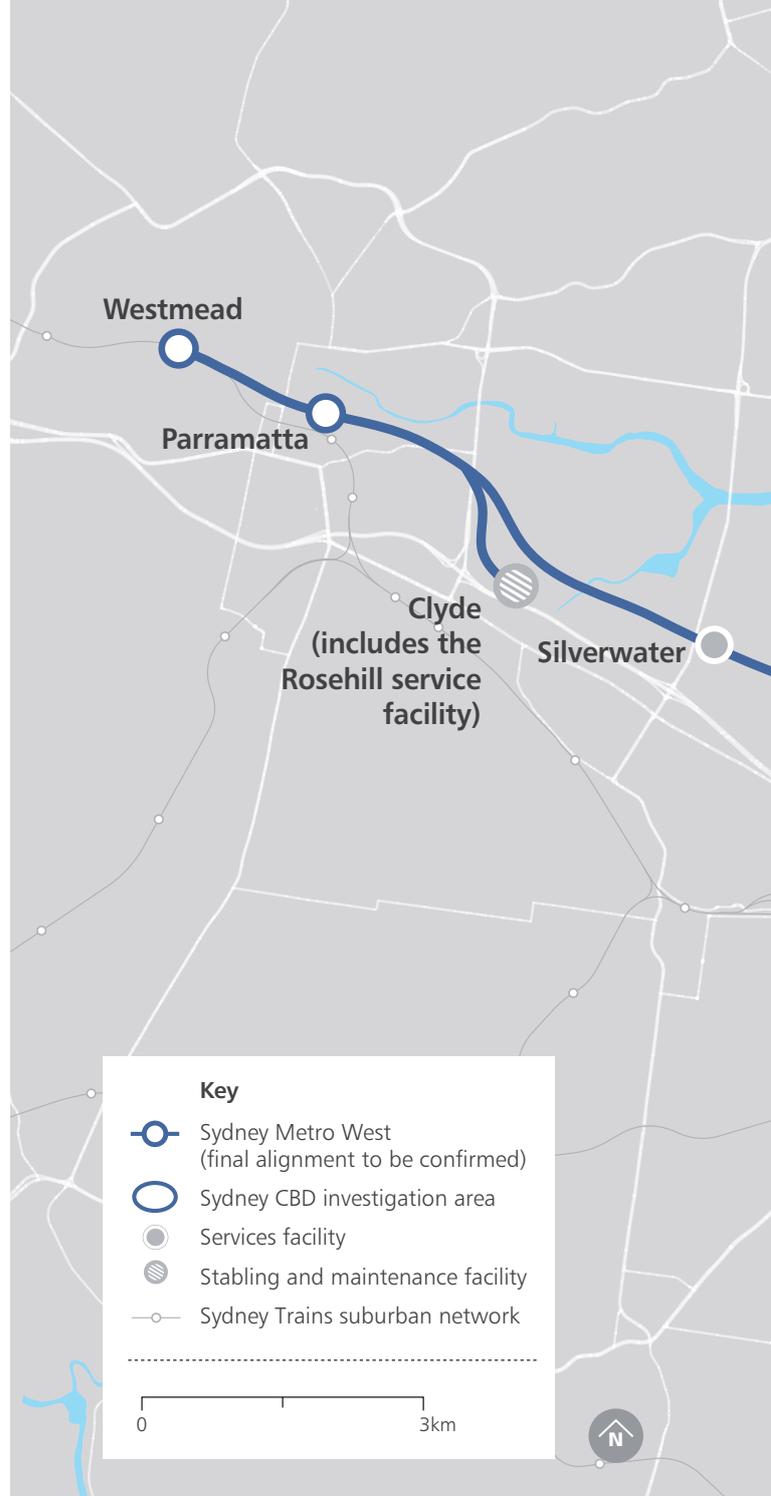
Construction has now started to prepare the site for the transformation of The Bays, including the new metro station.

In late 2019, the international search began for tunnel builders capable of building more than 50 kilometres of new metro railway tunnels – likely to be the longest tunnelling contract awarded in the nation’s history.

Sydney Metro West will double rail capacity between Parramatta and the Sydney CBD, supporting the Greater Sydney Commission’s vision for better connections between these two major centres.

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

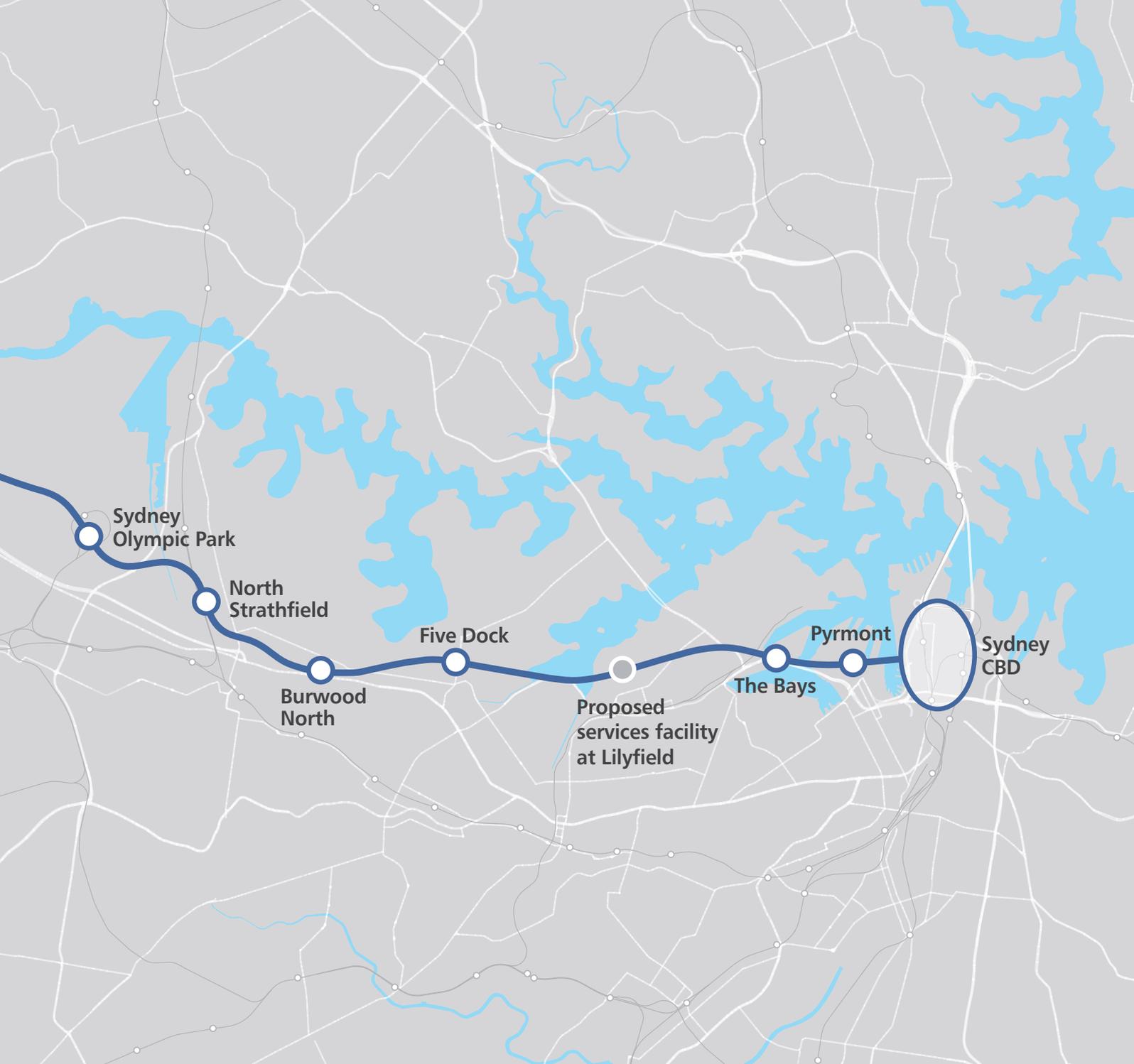
The locations of seven proposed metro stations have been confirmed at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock and The Bays. Further work is underway to determine the location of the new metro stations in Pyrmont and the Sydney CBD.



**Westmead**  
Supporting the growing residential area and health, research and education precincts.



**Parramatta**  
The number of jobs is expected to double over the next 20 years to 100,000.



**Sydney Olympic Park**

Home to 34,000 jobs and more than 23,000 residents by 2030.



**The Bays**

The delivery of a metro station is the first step to unlock the potential of The Bays.

# Sydney Metro – Western Sydney Airport project

Sydney Metro will service Greater Western Sydney and the new Western Sydney International (Nancy-Bird Walton) Airport.

The new Sydney Metro – Western Sydney Airport project will become the transport spine for the Western Parkland City’s growth for generations to come, connecting communities and travellers with the rest of Sydney’s public transport system with a fast, safe and easy metro service.

The project will provide a major economic stimulus in the heart of Western Sydney, supporting 14,000 jobs during construction, with more than 250 new apprenticeships on offer.

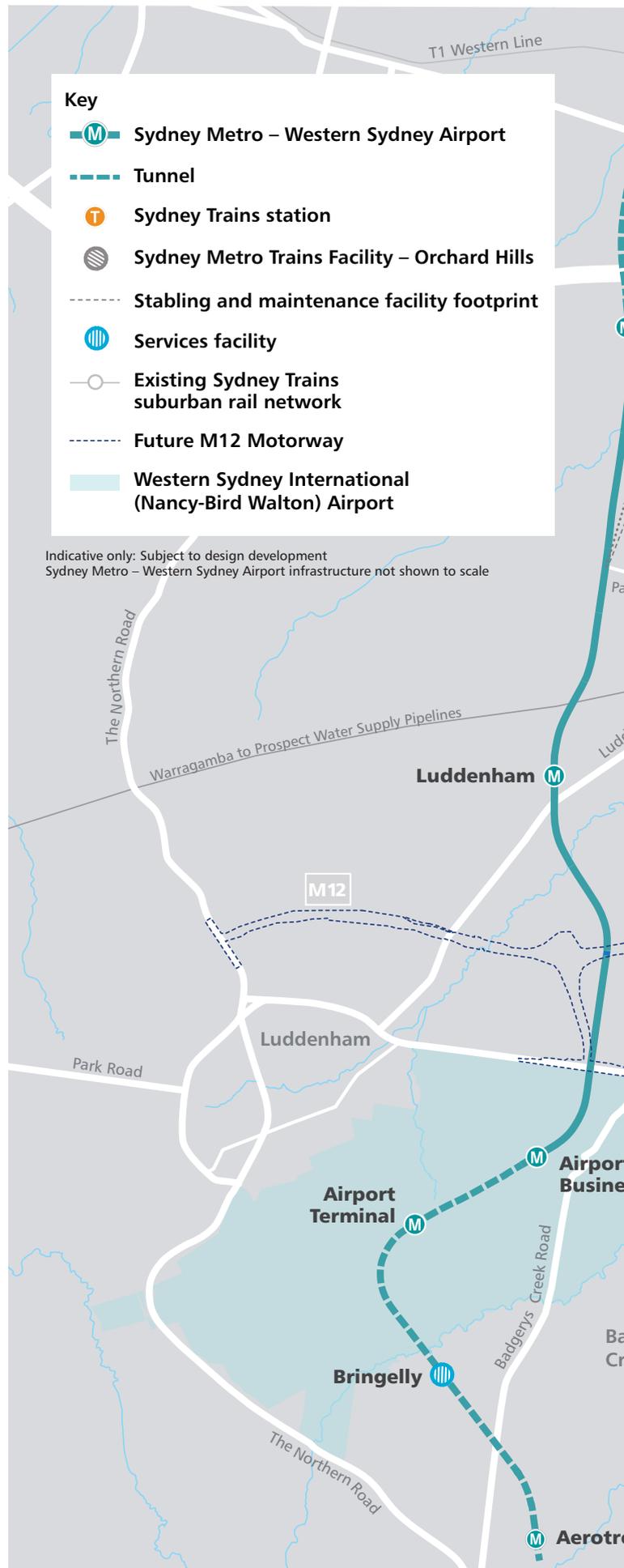
The new international airport will support nearly 28,000 direct and indirect jobs by 2031 and also underpin the development of a new city centre around it – Western Sydney Aerotropolis.

The airport and Aerotropolis will support around 200,000 new jobs in industries such as aerospace and defence, manufacturing, freight and logistics, tourism and research.

Six stations will be delivered along the alignment including two stations at Western Sydney International Airport, one at the Western Sydney Aerotropolis and one at St Marys - here customers will be able to connect to the existing Sydney Trains suburban T1 Western Line. Stations at Orchard Hills and Luddenham will service a future mixed-use precinct and an education and innovation precinct.

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 councils of the Western Parkland City.

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.





More opportunities for locals with access to future employment and education hubs within the Western Parkland City



Delivering rail to service the future research, innovation and commercial precinct in Luddenham.



A metro station at Western Sydney International Airport will open opportunities for Greater Western Sydney and connect it to the rest of the world.



The Australian and NSW governments have a shared objective of having metro rail operational when the Western Sydney International Airport opens for passenger services.



Artist Tim 'Phibs' de Haan's three-metre high temporary mural at the Marrickville site used patternmaking and symbolism to explore ideas including identity, First Nations people, native flora and fauna, and street art culture.

## A journey of new skills

From tunnellers to engineers, architects and apprentices.

Sydney Metro's workforce development and industry participation strategy has set new benchmarks in the delivery of infrastructure.

Sydney Metro provides a significant opportunity to support jobs and skills for a more diverse and inclusive workforce and supply chain.

The Workforce Development, Aboriginal and Industry Participation Plan sets out Sydney Metro's approach to driving jobs, skills, diversity and inspiring future talent through our projects.

The Sydney Metro Industry Curriculum program aims to increase workforce capability and capacity by developing transferable skills and competency of individuals across the industry, setting new industry benchmarks in work health and safety, leadership, quality and productivity.

The program's delivery is supported through collaborative partnerships with the NSW Department of Education and Training Services NSW.

Between February 2017 and December 2020, Sydney Metro achieved successful delivery of the program to almost 5000 workers and more than 10,000 are expected to complete it during the delivery of the Sydney Metro City & Southwest project.

The Sydney Metro pre-employment program is a collaborative model providing accredited entry-level technical skills and employability training for the long-term unemployed and other under-represented groups in the workforce.

By mid-2019, 133 people had completed the program with 48 per cent Aboriginal participation, 95 per cent successful completion and 84 per cent job outcomes. After successfully completing the pre-employment program, many candidates started training for a certificate level II traineeship or III apprenticeship to further develop their skills.

The program continues to contribute to increasing social equity of young people under 25, Aboriginal people and women in construction.



## Changing 700 lives

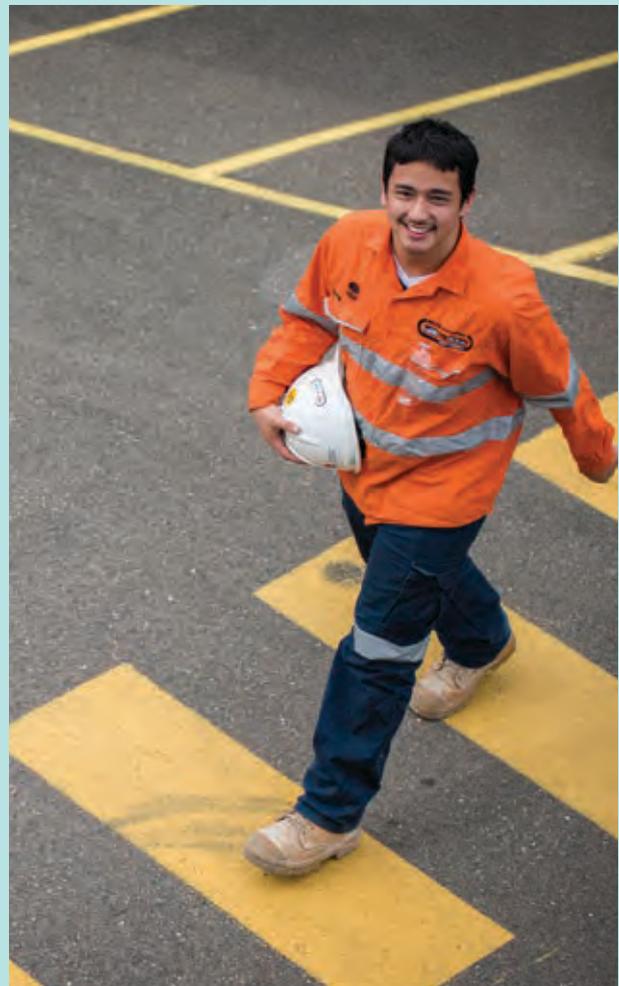
Since 2012, Sydney Metro has set minimum targets for apprentices and trainees on the project.

To date more than 720 apprentices and trainees have worked on Sydney Metro.

In addition Sydney Metro has an apprentice and trainee program which was developed to meet the demands of Sydney's booming infrastructure projects.

The program aims to improve completion rates as well as meeting the needs of industry to build capacity.

More than 720 apprentices and trainees have so far worked on Sydney Metro.





Beryl Solar Farm at Gulgong.

## Energy offset program online

A solar farm in regional NSW is helping deliver a new generation of metro rail services in Sydney's north west.

The farm, known as the Beryl Solar Farm, includes about 355,000 solar modules on a 145-hectare site outside Gulgong.

It has been supplying electricity to the power grid since May 2019.

Part of the electricity produced by Beryl is used to offset the entire operational electricity needs – approximately 134,000 megawatt hours a year – of the Metro North West Line.

In 2013, the NSW Government committed that greenhouse gas emissions from operational electricity use on the new metro will be fully offset.

The Beryl Solar Farm created about 150 jobs during construction as well as ongoing employment in operations.

Separately, in 2017, a 1.1 megawatt solar array as big as a football field was installed at Sydney Metro HQ in Rouse Hill.

The 3287-panel array was, at the time, the biggest on any NSW Government building and covers more than 6500 square metres – two-thirds of the maintenance building roof at the Sydney Metro Trains Facility.

It generates about 1.5 million kilowatt hours of electricity per year – that's enough to power about 270 average homes for a year.

The electricity generated by the panels is used to power some of the Sydney Metro railway stations as well as the maintenance facility, where Sydney's new metro trains are serviced.

The new metro trains use high voltage power not related to the Rouse Hill solar array.

Sydney Metro trains also use regenerative braking: extra energy from a slowing train is turned back into energy and used by another train nearby.

# Mindful winners

Cumberland High School won Sydney Metro's 2019 Metro Minds STEAM Challenge.

Year 9 and 10 students had to come up with a solution to an opportunity or a challenge that could face a railway like Sydney Metro.

They took on real project roles, employed the design thinking process, and worked with Sydney Metro ambassadors to refine their ideas as part of Sydney Metro's FastTracking the Future education program.

The challenge was undertaken by 22 teams from seven schools. Finalist teams were shortlisted and invited to the finals event where they pitched their ideas to an audience of parents, teachers and a judging panel.

Cumberland High School presented the concept of 'Jump Smart Sensors' to identify track faults and people inside the rail corridor; the team in second place, Sefton High School, devised a way to complement existing wayfinding aids to help customers moving through stations and between modes of transport.

The student teams produced a concept brief, video pitch and design of their innovation, then presented them to Sydney Metro.



Cumberland High School.

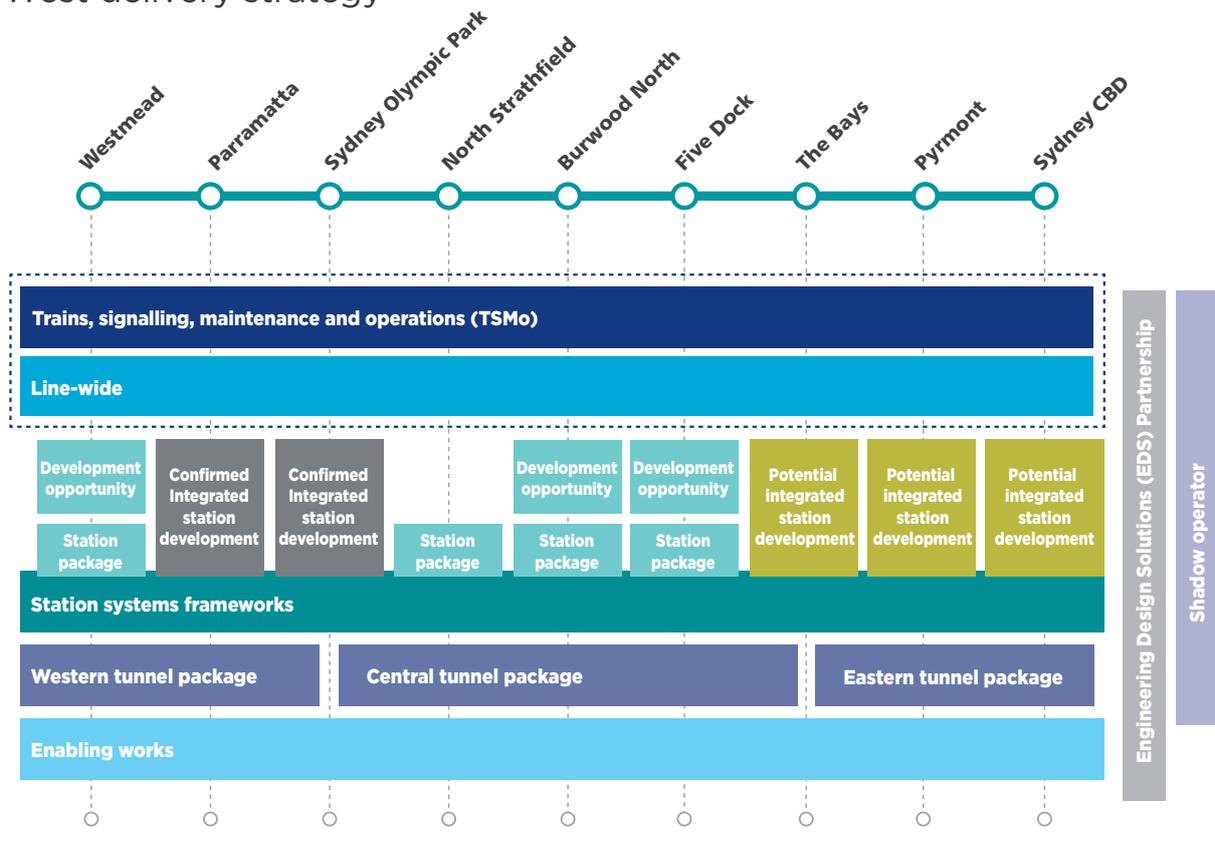


Scan to view  
Mega project  
collaboration

# Delivering a once-in-a-century program

The biggest urban rail infrastructure investment in Australian history.

## West delivery strategy



### Key

Station package West (including development opportunities procured with station) (design and construct)

Potential PPP packages(s)

Framework packages(s)

Integrated station development (4 or 5x packages) (single two-part project development agreement and design and construct deed) Bays Precinct ISD subject to resolution of master planning

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

Sydney Metro's world-scale infrastructure investment is being delivered through innovative – and evolving – delivery strategies put in place to ensure the goals and deadlines on individual projects are met.

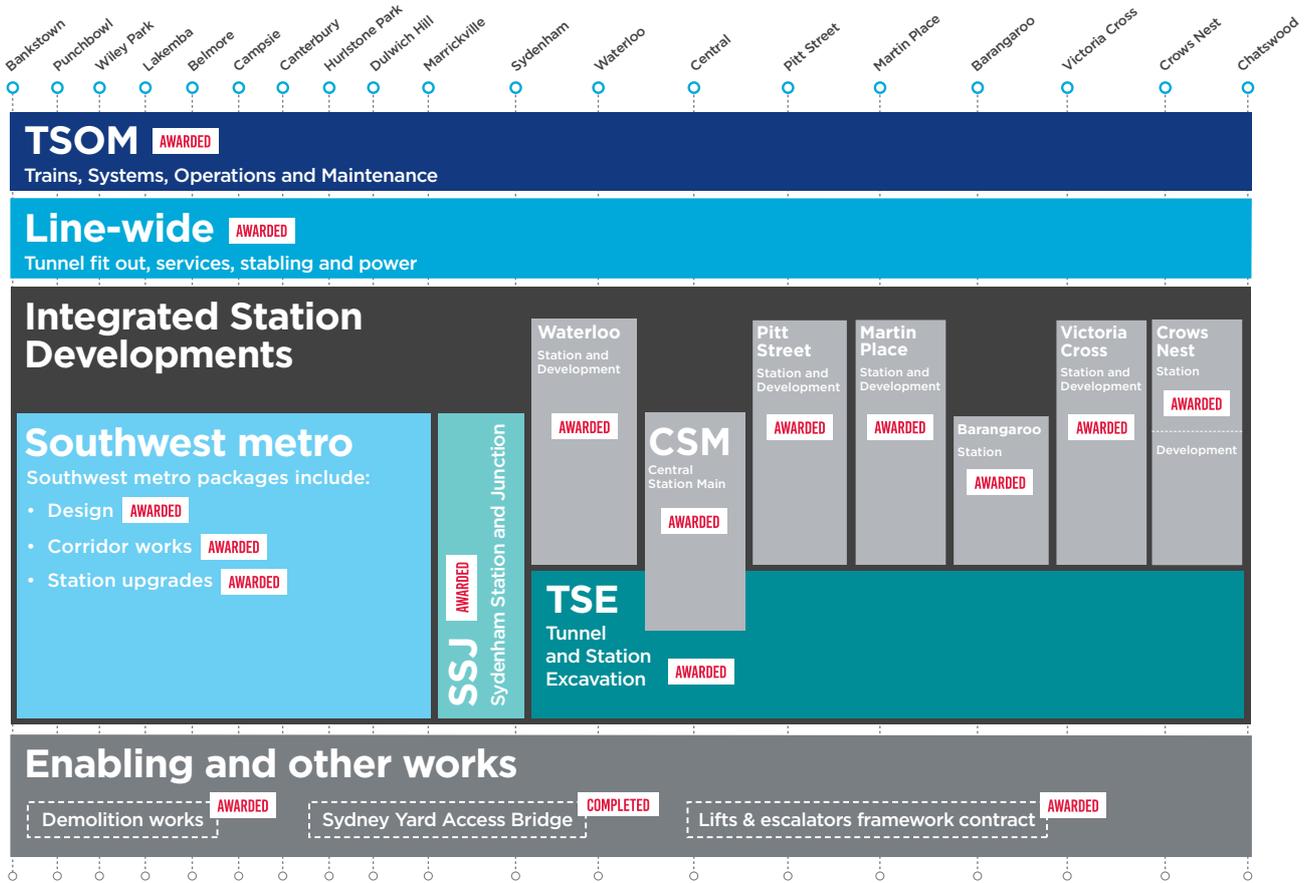
Working with industry has been a hallmark of Sydney Metro since 2011.

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

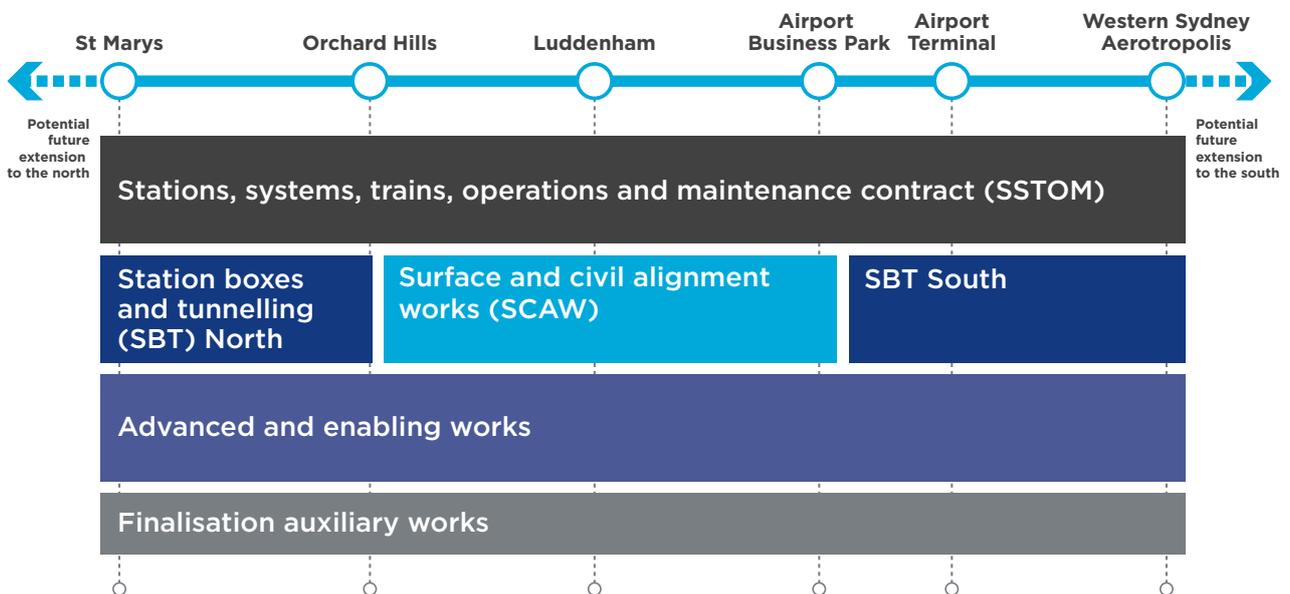
This engagement process has maximised industry input at the early stages and helped ensure the desired outcome – an outstanding transport product that is value for money and puts the needs of the customer first.

More than 3,600 people from over 800 companies around Australia and across the world have attended eight major industry briefings since 2011.

# City & Southwest delivery strategy



# Sydney Metro - Western Sydney Airport delivery strategy



# Sydney's new metro train

## Key facts



**In peak**  
Train every four minutes



**Metro stations**  
State-of-the-art, fully accessible



**No timetable**  
Customers will just turn up and go

**98%**

**On-time**  
Running reliability

## 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

## Capacity



Maximum Sydney train customers per hour per line

## 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



Scan to view  
Real time journey  
for aficionados



**Connected**

Continuous mobile phone coverage through network



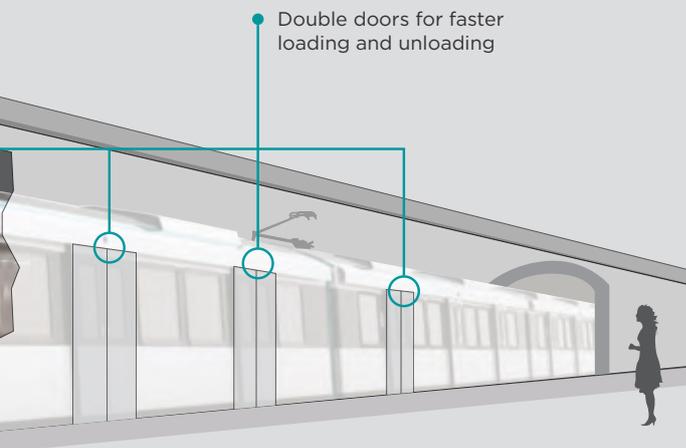
**38 cameras on each train**



**Video help points on all platforms**



**Opal**



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



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



Real-time travel information and live electronic route maps

**Constant monitoring**  
Expert train controllers monitor entire metro system

**Security**  
More than 230 tunnel cameras on North West Metro alone

**Signalling and communications systems**  
Control the trains, tunnels, platforms and skytrain to deliver a safe and reliable journey



The Operations Control Centre



**Operations Control Centre**  
State-of-the-art network controlled from new high-tech facility at Tallawong Road

**Faster journeys**  
System minimises the time trains are stopped at stations and the time between each train



# A new generation of tunnelling

Deep under Sydney, new technology and new opportunities.

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 15-kilometre twin tunnels for the Metro North West Line between Bella Vista and Epping.

This was the first time in Australian history that four TBMs were used on the one transport infrastructure project. Breaking that record less than two years later, five TBMs were used to deliver the twin tunnels between Chatswood and Sydenham. This included a specialised TBM for the section under Sydney Harbour because of the ground and rock conditions found at the bottom of the harbour.

In late 2019, the expressions of interest process started for the underground Sydney Metro West railway to deliver almost 50 kilometres of twin railway tunnels between Greater Parramatta and the Sydney CBD.



## City & Southwest tunnelling

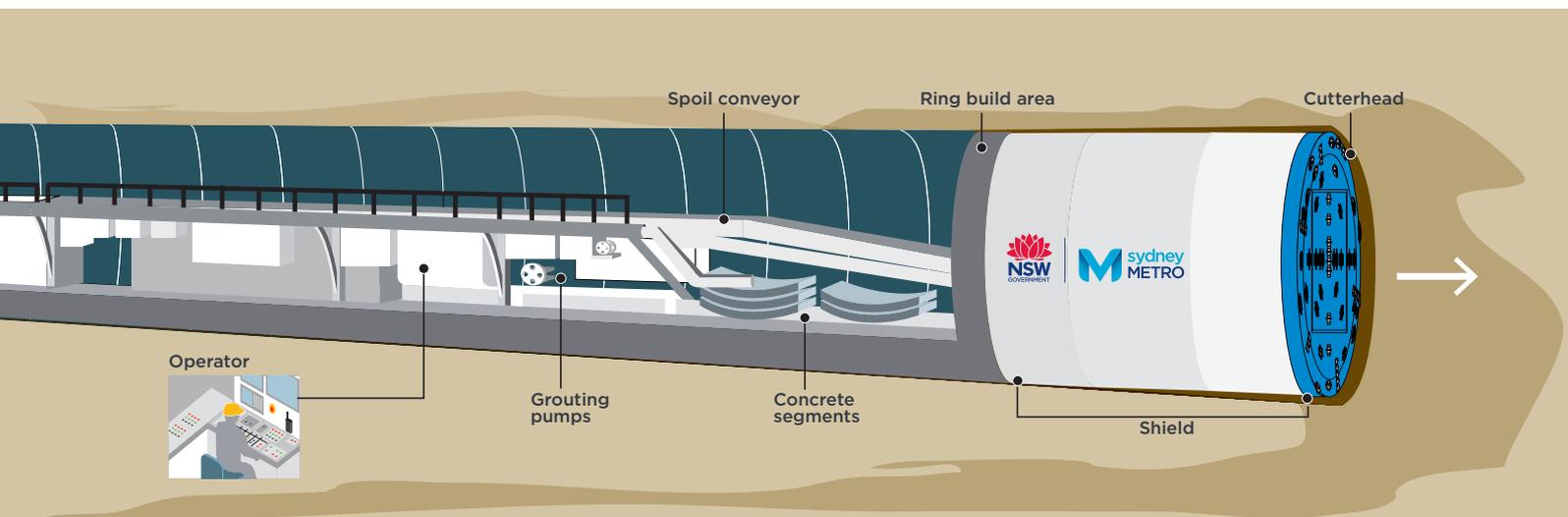
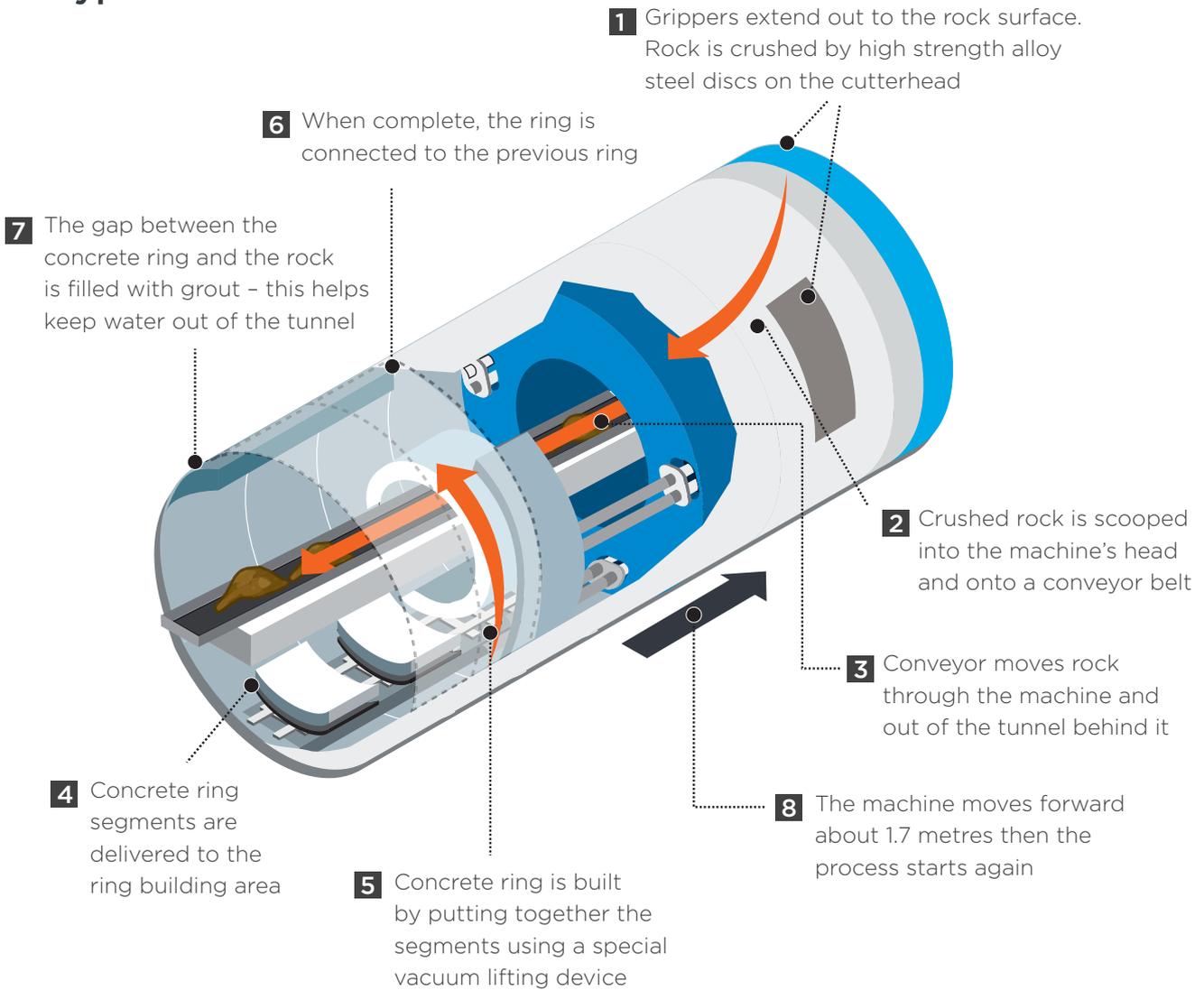
<b>93%</b> boring through Sydney sandstone, the rest shale and sediments	<b>3</b> TBM launch sites	
<b>120 metres</b> of tunnel cut every week, on average	<b>6 metres</b> internal tunnel diameter	<b>99,746</b> concrete segments line the tunnels
<b>940</b> Olympic swimming pools or 2.8 million tonnes of crushed rock generated by tunnelling	<b>15</b> people work on each TBM at any one time	<b>24/7</b> around-the-clock operation underground

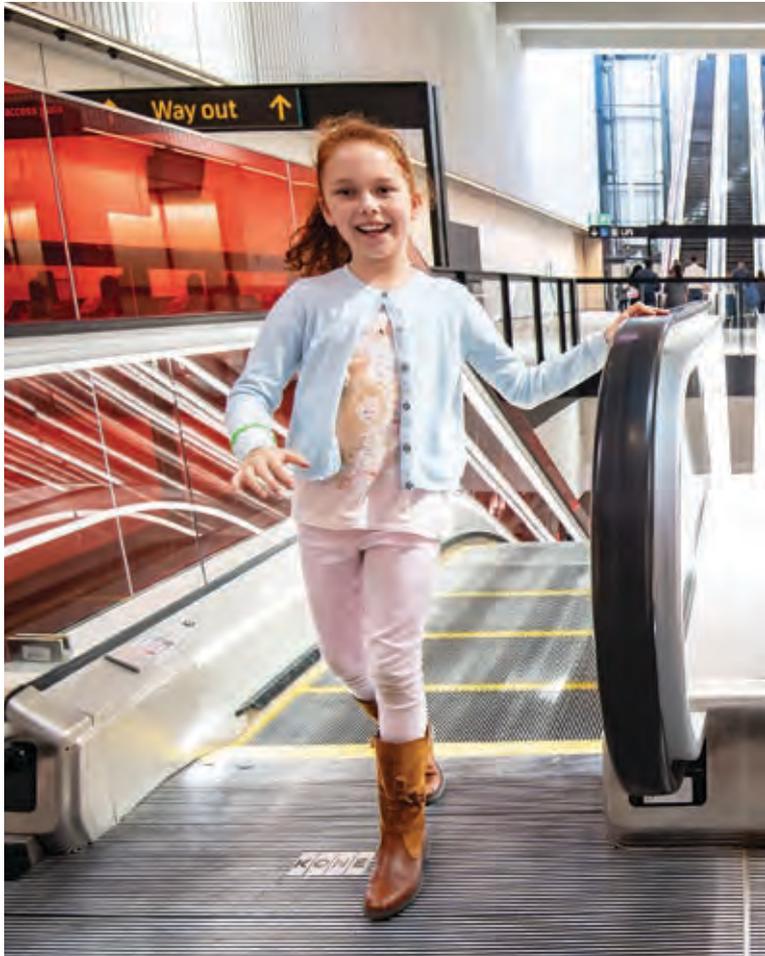


Meal room / toilets



# A typical TBM







Clockwise from top left:  
Rouse Hill Station; TBM Mum  
Shirl being lifted by crane from  
Barangaroo; Castle Hill community  
day; Sydney Metro graduate Tracy  
Connell; A school holiday workshop.



Scan to view  
Picture gallery



