Part B

Proposal description – operation

5

5.0 Proposal description – operation

This chapter outlines how Sydney Metro West would operate and be maintained between Westmead and the Sydney CBD, and how customers would use the rail line (this proposal) (Section 5.1 to 5.6). A detailed description for each station and key ancillary infrastructure is provided in Chapter 7 (Westmead metro station) to Chapter 17 (Clyde stabling and maintenance facility and Rosehill services facility) of this Environmental Impact Statement.

The description of this proposal is indicative and based on the current level of design. Some design elements of this proposal would continue to be refined as part of the design development process and including ongoing consultation with key stakeholders.

5.1 Proposal overview

5.1.1 Key features

Key operational features of this proposal would include:

- operation of a turn-up-and-go metro service in about 24 kilometres of twin tunnels between Westmead and the Sydney CBD
- new metro stations at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock, The Bays, Pyrmont and Hunter Street (Sydney CBD)
- access and interchange features to allow transfers to other modes of transport (such as the existing suburban rail network and other parts of the metro network) and the surrounding precinct
- services within each of the metro stations, including mechanical and fresh air ventilation equipment and electrical power substations to supply power
- a stabling and maintenance facility at Clyde, and associated aboveground and belowground tracks to connect to the mainline tunnels and other operational ancillary infrastructure
- a services facility at Rosehill (within the Clyde stabling and maintenance facility)
- provision of structures for non-station use (e.g. retail, commercial and/or community facilities)
- provisions for future over and/or adjacent station development at relevant stations, including structures for future developments where these cannot be delivered separately to the metro stations
- subdivision of sites.

Key operational features of this proposal are shown in Figure 1-2.

5.1.2 Key characteristics

The Sydney Metro network has been designed with a focus on the customers' experience, which incorporates all aspects of travel associated with the transport network, services and the:

- decision on how to travel – the new metro service would be integrated with other transport modes, including transfers with the existing Sydney Trains suburban rail network, pedestrian and cycle networks, light rail and buses
- travel information available – state-of-the-art technology is proposed to 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 onboard trains
- speed and comfort of the journey
- range and quantity of services available at stations, interchanges and within station precincts.

Sydney Metro West would help customers achieve their daily tasks, whether it's travelling to work or home or accessing travel opportunities.

A high-quality door-to-door transport service is critical to attract and retain customers, and to meeting broader transport and land use objectives. This includes providing:

- a system that is inherently safe for customers on trains, at stations and at the interface with the public domain
- direct, comfortable, well-marked and safe routes for customers between transport modes
- a clean, pleasant and comfortable environment for customers at stations and on trains.

Making it easy for customers at each stage of their journey is integral to the success of Sydney Metro. Key characteristics of Sydney Metro that would be delivered by this proposal are outlined in Table 5-1.

Table 5-1 Key metro characteristics

Product characteristic	Description
Fast and reliable service	• delivering fast journeys between stations with new generation single deck trains • ensuring easy boarding and alighting to reduce dwell times at stations • creating a highly reliable service.
Ability to move more people	• designing infrastructure, trains and systems to be able to run 30 trains per hour at ultimate capacity • ability to move more than 40,000 customers per hour in each direction at ultimate capacity.
Modern trains and technology	• trains operate safely closer together with communications-based train control that allows automated train operations and driverless operation • on-board real time travel information and live electronic route maps.
Accessible system	• fully accessible stations and single deck trains • at least three double doors per side per carriage for faster loading and unloading • level access and reduced gaps between the platform and train – providing access for all • designing for bicycles on trains • delivering modern customer information systems.
Highly legible	• ‘turn-up-and-go’ frequencies means there is no need for a timetable • consistent stopping patterns that mean metro would stop at all stations.
Safe and secure	• improving customer experience with customer service assistants at every station, and customer service assistants moving through the network during the day and night • ensuring customers can see all the way along the train and move easily between carriages, including wide, open walkways between carriages • providing platform screen doors at stations that keep people and objects away from the edge, improving customer safety and allowing trains to get in and out of stations much faster.
Comfortable service	• air-conditioned trains with large windows, warm lighting and open walkways • seating and standing room designed to maximise personal space • easy boarding and alighting at stations.

5.2 Placemaking and design

Chapter 7 of *Sydney Metro West Environmental Impact Statement – Westmead to The Bays and Sydney CBD* (Sydney Metro, 2020a) provides the approach to placemaking, the design process and the place and design principles for stations and ancillary facilities and includes integration with strategic planning for stations between Westmead and The Bays. Chapter 5 of *Sydney Metro West Environmental Impact Statement – Major civil construction between The Bays and Sydney CBD* (Sydney Metro, 2021a) includes integration with strategic planning for Pyrmont and Hunter Street (Sydney CBD) stations. In accordance with Concept condition of approval C-B1, the design of this proposal would have regard to the place and design principles outlined in the previous Sydney Metro West planning applications so that a high-quality urban design response is achieved.

This section provides an overview of the approach to placemaking for this proposal, the role of the design guidelines, corridor-wide urban design principles and the design process. Details about placemaking outcomes for each station and ancillary facility are provided in Chapter 7 (Westmead metro station) to Chapter 17 (Clyde stabling and maintenance facility and Rosehill services facility) of this Environmental Impact Statement. An overview of how this proposal meets the relevant transport and connectivity outcomes of the *Healthy Built Environment Checklist* (NSW Government, 2020a) is provided in Appendix I (Healthy Built Environment Checklist).

5.2.1 Policy framework

Placemaking and the approach to design is guided by a number of NSW Government policies and guidelines, primarily developed by the Government Architect NSW. The key policies and guidelines (shown in Figure 5-1) and their role include:

- *Better Placed* (Government Architect NSW, 2017) is an integrated design policy for the built environment of NSW. It seeks to capture the collective aspiration and expectations for the places where we work, live and play. It creates a clear approach to ensure good design that will deliver the architecture, public places and environments we want to inhabit now and those we make for the future
- *Greener Places* (Government Architect NSW, 2020a) is a design framework for urban green infrastructure. It seeks to capture the collective aspiration and expectations in planning, designing and delivering green infrastructure in urban areas across NSW
- *Connecting with Country* (Government Architect NSW, 2020b) is a draft framework for developing connections with Country that can inform the planning, design, and delivery of built environment projects in NSW
- *Designing with Country* (Government Architect NSW, 2020c) is a discussion paper that encourages a response to Aboriginal cultural connections to Country in the design and planning of new projects
- *Aligning Movement and Place* (Government Architect NSW, 2019) sets out a better approach to aligning movement and place in the design, planning, construction and operation of NSW's overall transport network. The Aligning Movement and Place guideline was updated in November 2021, however the overall principles and objectives remain similar. Sydney Metro would consider the new 2021 guideline as part of ongoing design development
- *Practitioner's Guide to Movement and Place* (NSW Government, 2020b) guides the design and planning around streets and roads for NSW Government projects. The Practitioner's Guide to Movement and Place guideline was updated in November 2021, however the overall principles and objectives remain similar. Sydney Metro would consider the new 2021 guideline as part of ongoing design development
- Government Architect NSW's *Sydney Green Grid* (Tyrrell Studio and Office of the Government Architect, 2017) underpins Greener Places and aims to deliver an interconnecting network of open space that will keep the city cool, encourage healthy living, enhance biodiversity and ensure ecological resilience.

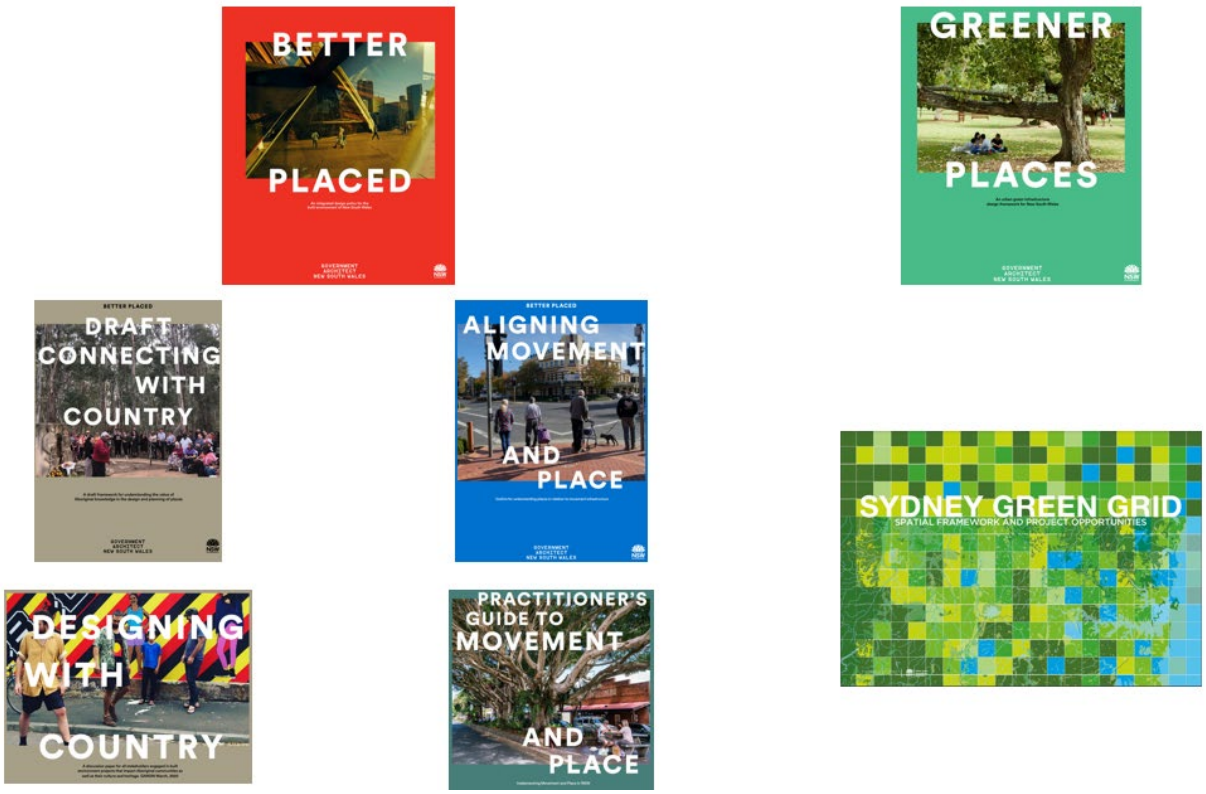


Figure 5-1 Placemaking and design policy framework

A number of other documents are available to guide the design of certain elements. The intent of these documents is being considered during the development of the design of stations, precincts and ancillary facilities. These guidance documents include:

- *Smart Places Strategy* (NSW Government, 2020c)
- *Cycleway Design Toolbox: Designing for cycling and micromobility* (Transport for NSW, 2020b)
- *Walking Space Guide: Towards pedestrian comfort and safety* (Transport for NSW, 2020c)
- *Water Sensitive Urban Design Guideline* (Transport for NSW, 2017)
- *Creating Walkable Neighbourhoods* (Active Living NSW, 2018).

5.2.2 Sydney Metro design objectives

To help meet Sydney Metro's vision to transform Sydney with a world-class metro, five design objectives have been identified to guide decision making and the design process. A design principle is prescribed to each design objective, describing the intention for the design of stations, station precincts and the wider metro corridor. The Sydney Metro design objectives and principles, and their alignment with the objectives outlined in *Better Placed* are provided in Table 5-2.

Table 5-2 Sydney Metro design objectives

Design objective	Principle	Relevant Better Placed objectives
Objective 1: Ensuring an easy customer experience	Sydney Metro places the customer first. Stations are welcoming and intuitive with simple, uncluttered spaces that ensure a comfortable, enjoyable and safe experience for a diverse range of customers.	Objective 4: Better for people – safe, comfortable and liveable Objective 5: Better working – functional, efficient and fit for purpose

Design objective	Principle	Relevant Better Placed objectives
Objective 2: Being part of a fully integrated transport system	Sydney Metro is a transit-oriented project that prioritises clear and legible connections with other public and active transport modes within the wider metropolitan travel network that intersect with this new spine.	Objective 5: Better working – functional, efficient and fit for purpose
Objective 3: Being a catalyst for positive change	Sydney Metro is a landmark opportunity to regenerate and invigorate the city with new stations and associated developments that engage with their precincts, raise the urban quality and enhance the overall experience of the city.	Objective 6: Better value – creating and adding value Objective 7: Better look and feel – engaging, inviting and attractive
Objective 4: Being responsive to distinct contexts and communities	Sydney Metro's identity is stronger for the unique conditions of centres and communities through which it passes. This local character is to be embraced through distinctive station architecture and public domain that is well integrated with the inherited urban fabric of existing places.	Objective 1: Better fit – contextual, local and of its place Objective 3: Better for community – inclusive, diverse and connected
Objective 5: Delivering an enduring and sustainable legacy for Sydney	Sydney Metro is a positive legacy for future generations. A high standard of design across the corridor, stations and station precincts, which sets a new benchmark, is vital to ensuring the longevity of the metro system, its enduring contribution to civic life and an ability to adapt to a changing city over time.	Objective 2: Better performance – sustainable, adaptable and durable Objective 6: Better value – creating and adding value

5.2.3 Approach to placemaking

Understanding place

Aligning Movement and Place (NSW Government, 2021a) defines places as 'the spaces where we get together, relax, celebrate and contemplate, as well as work, participate in civic life, learn and exchange'.

The delivery of Sydney Metro West offers the opportunity to transform areas with new places, or to reinforce and enhance existing places. The approach to placemaking is based on a multifaceted approach to the planning, design, and management of public spaces, which aims to create public spaces that promote people's health and wellbeing.

The approach to placemaking at each precinct is contextual, taking into consideration that metro stations would:

- function as 'places' in their own right, creating focal points in the communities each station serves. The stations would attract a range of benefits and land uses, including reducing dependence on private vehicles, and providing public places for gathering and human interaction supported by commercial and retail, as well as encouraging exercise by promoting walking and cycling to and from the stations
- have a role in contributing to their surrounding environment or 'place' in which they are located by supporting planned growth and renewal, and acting as a catalyst for transit-oriented development within their catchments.

Understanding movement

Aligning Movement and Place (NSW Government, 2021a) identifies that 'movement enables people to connect with one another and pursue leisure and recreational activities. It is also about efficiently delivering goods and services to drive economic growth'.

Movement refers to how transport networks are integrated with land use and public space, and how they serve users' needs to support the overall place vision.

Placemaking outcomes around each station aim to strike a balance between movement and place, taking guidance from a *Practitioner's Guide to Movement and Place* (NSW Government, 2021b). Movement and place have a different relationship depending on whether trips are within, to and from, and/or through places. Achieving the right balance for a particular location may require exploration of alternatives, such as rerouting through-movement where it conflicts with those places.

For metro stations, the balance between movement and place is critical to provide:

- places at and around stations as focal points in the community and as areas with high pedestrian volumes
- efficient movement and interchange of people to and from the station as pedestrians, cyclists, customers on other public transport modes, point-to-point or via private vehicle
- efficient movement of people, cyclists and motorists through and around station precincts.

Further details on key movement and place outcomes at each station are provided in Chapter 7 (Westmead metro station) to Chapter 17 (Clyde stabling and maintenance facility and Rosehill services facility) of this Environmental Impact Statement.

Role and scope for placemaking

Sydney Metro considers placemaking opportunities at different scales, starting from the station itself, extending to the interchange area, and to the broader area in which the station and interchange are located.

Sydney Metro's role in delivery changes as the scale increases. Sydney Metro's scope to deliver and influence place outcomes is highest within the station and interchange area. The physical extent of this area differs from station to station depending on context, but generally includes station plazas and interchange infrastructure in the immediate surrounds of the station. In some locations this may include areas for over and/or adjacent station development, placemaking or transport integration purposes.

At all stations, Sydney Metro would deliver public domain elements and work with other parts of Transport for NSW to deliver transport integration elements. This would ensure that stations and interchanges are attractive, safe, functional and allow for the gathering and movement of people. Within station and interchange areas, Sydney Metro would also explore opportunities for activation, retail and other specialised spaces for the customer and community.

The proposal description for each precinct details the list of public domain and interchange elements to be delivered as part of this proposal.

Sydney Metro would provide connections to service key attractions and enable opportunities for land use change and placemaking more broadly.

Integration with broader land use planning led by state and local government agencies is an important consideration for the precinct. This can help ensure that mass transit amenity offered by the station is supported by appropriate land uses and densities, which contribute to liveability of areas through supporting public transport use and reducing the need for private vehicle use.

Over station development and adjacent station development

All Sydney Metro West stations are being designed to integrate with their surrounding areas, to make vibrant and attractive places that reflect the unique context and future aspirations for each place.

The *Sydney Metro West Environmental Impact Statement – Westmead to The Bays and Sydney CBD* (Sydney Metro, 2020a) identified that the provision for future integrated station and/or precinct development would allow for the future provision of a range of uses, such as community facilities, new homes, shops, restaurants and commercial office space.

As the design for Sydney Metro West has further progressed, opportunities for two types of potential development have been identified – over station development and adjacent station development.

Integrating a mix of uses and development into the station precinct would contribute to the success of places by:

- encouraging precinct activation and use of Sydney Metro West across different times of the day and week
- creating opportunities to provide facilities that meet customer and community needs, attracting people to stations
- allowing stations to successfully integrate into their urban context and to contribute positively to the character of places at the stations.

Sydney Metro West stations would be designed with provisions for over and/or adjacent station development at Westmead, Parramatta, Sydney Olympic Park, Burwood North, The Bays, Pyrmont and Hunter Street (Sydney CBD).

Sydney Metro will continue to work closely with the local community and stakeholders so that station precincts are welcoming hubs that build on the local character.

5.2.4 Design guidelines

Station and precinct design guidelines have been developed for Sydney Metro West to guide the design of:

- the interface between stations and their immediate surrounds, including:
  - station entries
  - transport interchange facilities (bicycle facilities, bus stops, kiss and ride, point-to-point facilities and transfers to existing metro, rail, buses and existing and future light rail)
  - landscaping and other elements of the public domain
  - heritage interpretation and Connecting with Country
- station, stabling, maintenance and service buildings, including underground stations
- rail corridor works including tunnel dive structures, bridges and underpasses.

The design guidelines identify corridor-wide station and precinct design principles that can be applied across all sites, as well as place-specific design principles that respond to contextual factors.

The station and precinct design guidelines are provided in Appendix E (Design Guidelines).

5.2.5 Corridor-wide urban design principles

The design guidelines also identify corridor-wide urban design principles (refer to Table 5-3) to guide future stages of design development. The corridor-wide urban design principles have been developed so that all stations are part of a network and together contribute to a corridor of activity centres that offer social, employment and housing opportunities while also contributing to local character.

Table 5-3 Sydney Metro West corridor-wide urban design principles

Title	Urban design principle
Land use and function	• identify uses that support and contribute to the delivery of unique, attractive and vibrant urban centres which provide a sense of connection and identity for local communities and visitors • activate the public domain of station precincts to integrate stations and supporting infrastructure with existing and desired future urban settings.
Places and spaces	• ensure the scale of development reflects existing and desired future character • reflect and build on opportunities to strengthen design and place outcomes for Aboriginal and non-Aboriginal heritage • create a safe and legible hierarchy of public spaces such as parks, plazas and pedestrian links for active and passive recreation.
Access and connectivity	• prioritise walking and other modes of active transport in the design of stations, interchanges and associated developments • integrate walkable urban environments with the Green Grid to contribute to safe, permeable and well-connected station precincts • manage the design of streets in accordance with Movement and Place principles • enable easy connections with other transport services.
Environment and sustainability	• precinct planning supported by ‘Designing with Country’ strategy • contribute to the evolution of a new urban development paradigm that incorporates environmentally sustainable elements, processes and designs • maximise green infrastructure.

The corridor-wide principles have been applied to create the place-specific urban design strategies for each station precinct and facility (including the Clyde stabling and maintenance facility and Rosehill services facility).

Connecting with Country

The Sydney Metro West corridor traverses Burramattagal, Wangal and Gadigal Country. Westmead and Parramatta are situated on Burramattagal Country, which extends from Rosehill to Prospect. Sydney Olympic Park to The Bays is situated on Wangal Country, which stretches across the southern shore of the Parramatta River between Burramattagal Country and Gadigal Country. The Sydney CBD is situated on Gadigal Country, which runs from the south side of Port Jackson, extending from South Head to Darling Harbour.

Sydney Metro is piloting the Connect with Country framework and developing a corridor-wide approach to connect with Country and an ongoing approach to Aboriginal engagement. As part of the pilot Sydney Metro is working with Aboriginal knowledge holders in the development of heritage interpretation and throughout design development. A draft Heritage Interpretation Strategy (Appendix K)has been prepared for this proposal in accordance with Concept conditions of approval CB4 to CB6, which includes how Aboriginal heritage values would be interpreted and reflected within the design of this proposal.

Further details regarding Sydney Metro's approach to connecting with Country, and heritage and archaeology design guidelines are provided in Appendix E (Design Guidelines).

Green infrastructure

Green infrastructure refers to the network of open spaces, natural and semi-natural systems, including parks, rivers, bushland and private gardens which support quality of life in urban environments.

Greener Places identifies the NSW Government's infrastructure and urban renewal projects as an opportunity for the delivery of quality green infrastructure. Sydney Metro West would support the principles of *Greener Places*, including:

- integration – the design would consider opportunities to integrate green infrastructure with metro stations and facilities
- connectivity – Sydney Metro West would provide opportunities to improve connectivity to open spaces, parklands, waterways and active transport routes. Opportunities to integrate with existing and planned walking and cycling networks would also be an important consideration in design.

The *Sydney Green Grid* proposes the creation and consolidation of a 'network of high quality green areas that connect town centres, public transport networks and major residential areas,' enhancing open space throughout Greater Sydney. With Sydney Metro West following the Parramatta River from Westmead to the Sydney CBD, there are opportunities for the stations and surrounding public domain to connect into or enhance Sydney's Green Grid.

Key opportunities related to green infrastructure and improving connectivity to existing and future Green Grid projects are identified for relevant precincts in Chapter 7 (Westmead metro station) to Chapter 17 (Clyde stabling and maintenance facility and Rosehill services facility) of this Environmental Impact Statement.

The station and precinct design guidelines in Appendix E (Design Guidelines) provide a range of guidelines related to green infrastructure, landscaping and tree planting. Of note, Sydney Metro West would provide a net increase in mature trees at a ratio of at least 2:1, which would result in an increase in tree canopy coverage within 10 years of the date of the Concept approval or no later than the commencement of operation of the CSSI (whichever is earlier) (in line with Concept conditions of approval C-B8 and C-B9).

5.2.6 Precinct place and design principles

Place and design principles have been developed for each Sydney Metro West station, station precinct and ancillary facility. The purpose of these principles is to guide future design through identifying outcomes that would be achieved at the station or ancillary facility and in the immediate public domain and interchange area. The principles build on the five Sydney Metro-wide design objectives and have considered relevant local council strategies and *Better Placed* design objectives.

Preliminary place and design principles for stations and ancillary facilities between Westmead and The Bays were provided in Chapter 7 of *Sydney Metro West Environmental Impact Statement – Westmead to The Bays and Sydney CBD* (Sydney Metro, 2020a). Preliminary place and design principles for Pyrmont Station and Hunter Street Station (Sydney CBD) were provided in Chapter 5 of *Sydney Metro West Environmental Impact Statement – Major civil construction between The Bays and Sydney CBD* (Sydney Metro, 2021a). These principles have since been further refined in consultation with key stakeholders (including relevant local and state government agencies). The refined place and design principles for each station and facility are included in Chapter 7 (Westmead metro station) to Chapter 17 (Clyde stabling and maintenance facility and Rosehill services facility) of this Environmental Impact Statement and in Appendix E. (Design Guidelines). Sydney Metro would work with key stakeholders to implement and achieve these principles.

5.2.7 Design process

The ongoing design development of the stations and precincts would be informed by the design objectives and principles, as well as feedback from community and stakeholders.

The design development process would be guided by a suite of documents that include:

- Sydney Metro design objectives (refer to Table 5-2)
- Design quality framework
- Design guidelines, including the place and design principles for Sydney Metro West (Appendix E).

These documents, along with community and stakeholder engagement and the use of a Design Advisory Panel / Design Review Panel will allow for high quality standards throughout the whole design process. At relevant stages in the design process, the design will be reviewed against the place and design principles and the design guidelines.

Design process documents

The documents that guide the overall design process are described in Table 5-4.

Table 5-4 Design process documents

Document	Description
Sydney Metro design objectives	The Sydney Metro design objectives have been developed to help meet the transformational vision and world class aspirations of all Sydney Metro projects. The design objectives are described in Section 5.2.2.
Design quality framework	Sydney Metro is preparing a Design Quality Framework in consultation with the Government Architect NSW. The Framework will establish the design quality assurance process for Sydney Metro projects and is intended to provide a structured process to integrate design quality assurance across the life cycle of each project. Design quality assurance is important in the delivery of Sydney Metro West given design quality is integral to the achievement of the government's value for money. Design value is a balance of social, economic and environmental factors. For Sydney Metro West, these may include how well the metro performs, how efficiently the metro operates, and what benefits the metro generates for the community and the environment. As each Sydney Metro project differs in terms of timing, procurement and delivery, the Design Quality Framework intends to provide a high-level process detailing how Sydney Metro ensures high-quality design throughout each project's lifecycle, regardless of the procurement and delivery strategy. The components of the framework would include Sydney Metro's: • Design Quality Statement defining Sydney Metro's ambition for design quality • Design governance protocol • Internal design gateway process • Design review protocol (including a Design Review Panel) • Design procurement protocol • Design integrity process.
Design guidelines	The design guidelines set overarching design objectives and principles for Sydney Metro, and corridor-wide station and corridor-wide precinct guidelines which can be applied across all sites, and place-specific guidelines. The design guidelines are described in Section 5.2.4 and are provided in Appendix E.

Document	Description
Place and design principles	The role of the place and design principles is to guide future design through identifying outcomes that would be achieved at the station and in the immediate public domain and interchange area. The principles build on the five Sydney Metro-wide design objectives and have considered relevant local council strategies and *Better Placed* design objectives. The place and design principles and how the design achieves these principles has been refined since the previous Sydney Metro West planning applications in consultation with key stakeholders. These principles are provided in Chapter 7 (Westmead metro station) to Chapter 17 (Clyde stabling and maintenance facility and Rosehill services facility) of this Environmental Impact Statement and Appendix E. (Design Guidelines).

Design review

The design of Sydney Metro West will continue to be subject to design review processes so that it responds to the design guidelines and achieves design excellence. This will include an internal design review process to maintain a level of quality which meets the needs and expectations of Sydney Metro customers and the people of NSW.

The design of Sydney Metro West and implementation of the design guidelines would also be subject to independent review by the established Sydney Metro Design Advisory Panel and future Design Review Panel/s. Their objectives are to provide independent design review of Sydney Metro West at all stages. This assists in meeting design objectives and achieving quality design outcomes. Further detail on the Design Advisory Panel and Design Review Panel is provided in Table 5-5. Further detail on review of design is included in Appendix E. (Design Guidelines).

Table 5-5 Independent design review

Group	Role
Design Advisory Panel	Sydney Metro has established a Design Advisory Panel to support the design development process. If planning approval for this application is granted, the Design Advisory Panel would transition to a Design Review Panel (refer below). The Design Advisory Panel provides independent design review to support the achievement of Sydney Metro project objectives, ensure quality design process and outcomes and guide strategic planning and urban design outcomes. The Design Advisory Panel is chaired by the Government Architect NSW and includes suitably qualified, experienced professionals to provide architectural, urban design, public domain and landscape advice. The Design Advisory Panel provides a forum for critique of design and guidance to placemaking and design teams on design refinements to be considered to realise place and design principles. Opportunities to respond to the Design Advisory Panel feedback that has been considered throughout design development for each precinct is discussed in Chapter 7 (Westmead metro station) to Chapter 17 (Clyde stabling and maintenance facility and Rosehill services facility) of this Environmental Impact Statement.

Group	Role
Design Review Panel	Sydney Metro will establish a Design Review Panel for Sydney Metro West. The Design Review Panel will provide independent, design review of stations and interchange areas, ancillary facilities and over and/or adjacent station development and endorse design integrity at key stages. The objective of the Design Review Panel would be to support the achievement of Sydney Metro's design objectives and ensure quality design process and outcomes. The Design Review Panel would support good design by: • having a remit that includes stations, ancillary infrastructure and associated integrated station and precinct development • providing independent design review of the integrated project throughout the design development • refining and endorsing design guidelines • reviewing and critiquing the design against the design guidelines. The role of the Design Review Panel would be advisory and its recommendations would not be binding on Sydney Metro. The composition of the Design Review Panel, including panel, size and membership will be determined in consultation with the Government Architect NSW. Panel members will be sourced from the State Design Review Panel unless otherwise agreed with the NSW Government Architect. Membership will include suitably qualified, experienced and independent professionals in each of the fields of: • urban design and placemaking • landscape architecture • architecture. The Design Review Panel may seek advice from suitably qualified, experienced independent professionals in other fields as required, including but not limited to sustainability, active transport and non-Aboriginal heritage. The Panel must also seek appropriate expertise to ensure Aboriginal cultural heritage and cultural values inform its advice. Sydney Metro would also provide an independent secretariat to support the Design Review Panel. The responsibilities of the independent secretariat will include maintaining a register of actions and outcomes. This will allow transparency and accountability of the Design Review Panel. Relevant councils and key stakeholders will be invited to participate in Design Review Panel meetings to advise on local issues and design outcomes as they relate to the local context.

Stakeholder engagement

Sydney Metro is committed to a collaborative design approach that includes consultation with relevant government agencies, local council and precinct partners. Consultation with local councils and other relevant precinct partners, including Sydney Olympic Park Authority and the NSW Department of Planning and Environment, has continued throughout the design of the stations, precincts and ancillary infrastructure. This has also included seeking feedback on the integration with the local area and future land use plans. Further detail on how the design of the stations and ancillary facilities has responded to stakeholder feedback is provided in Chapter 7 (Westmead metro station) to Chapter 17 (Clyde stabling and maintenance facility and Rosehill services facility) of this Environmental Impact Statement.

Community and stakeholder submissions to this Environmental Impact Statement would be considered in ongoing design development. An overview of ongoing and future community and stakeholder engagement and the process for providing submissions are provided in Chapter 3 (Stakeholder and community engagement) of this Environmental Impact Statement.

5.2.8 Customer experience and design

Customer Centred Design (CCD) is an iterative process which places the customer at the centre of all design decisions. This process aims to deliver an easy experience across the entire customer door-to-door journey.

CCD is an important part of the Sydney Metro West interdisciplinary design process because it provides evidence-based customer insights to inform design decisions throughout all stages of design. Customer research and testing help build on the existing insights by obtaining objective customer feedback. Collection of customer feedback informs design decisions based on diverse customer needs and aspirations to enable a world-class metro journey. Some of the methods used in undertaking CCD research include customer walkthroughs to understand customers needs, customer feedback sessions and interviews, and virtual reality testing to provide objective insights during the ongoing design process for Sydney Metro West. This research is undertaken to collect feedback from a wide representation of the community, including Aboriginal and Torres Strait Islander peoples, culturally and linguistically diverse community members, vulnerable or marginalised people, people with a disability and elderly people.

The objectives of customer testing and research is to:

- integrate CCD principles and processes into all stages of the design development and identify how the design has evolved to improve customer outcomes
- consider door-to-door experiences; including all station designs, precinct designs, and interchange between different modes of transport
- ensure design solutions address the Transport for NSW nine drivers of customer satisfaction and overall customer effort score
- iterate and improve the design based on customer research and testing.

5.3 Metro alignment and track

The alignment of this proposal between Westmead and Hunter Street (Sydney CBD) is shown in Figure 5-2 to Figure 5-9.

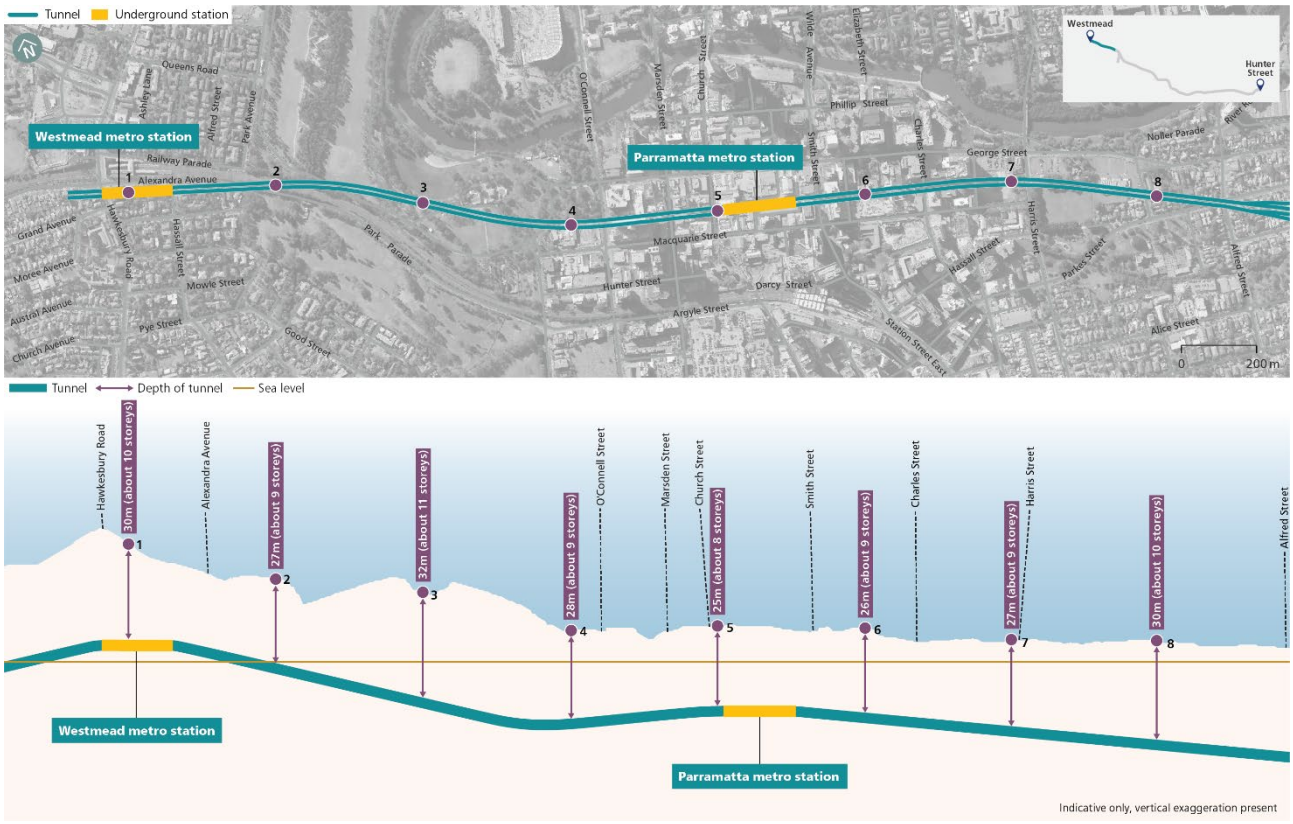


Figure 5-2 Indicative alignment plan and long section (1 of 8)

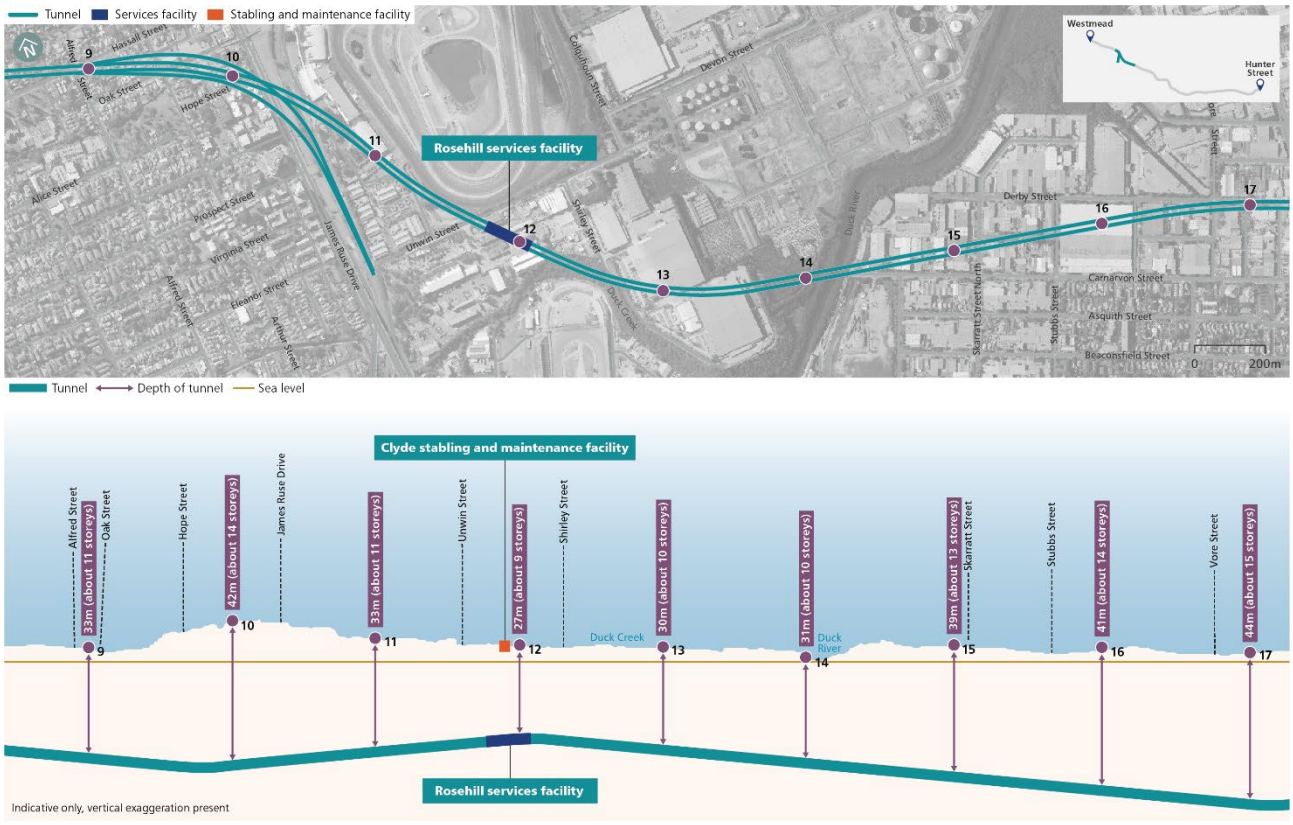


Figure 5-3 Indicative alignment plan and long section (2 of 8)

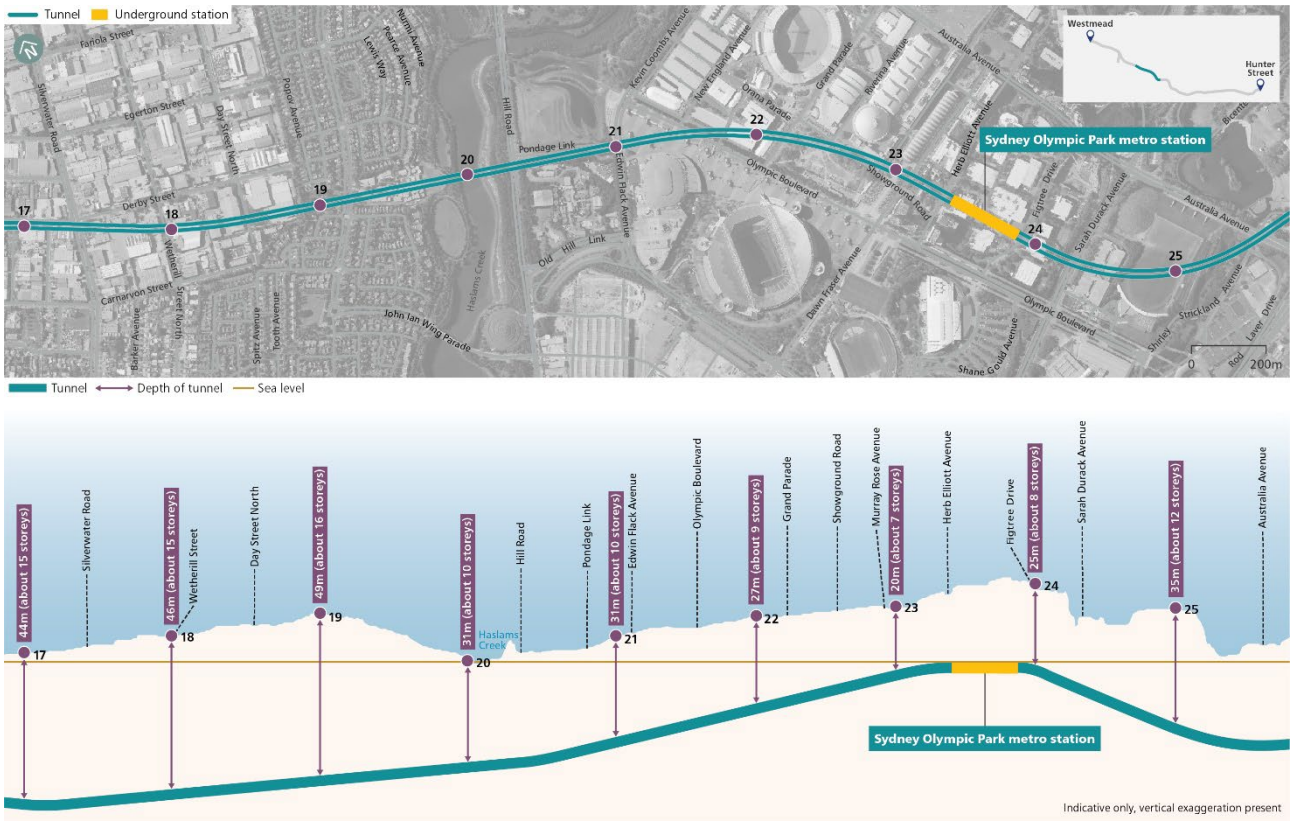


Figure 5-4 Indicative alignment plan and long section (3 of 8)

Figure 5-5 Indicative alignment plan and long section (4 of 8)

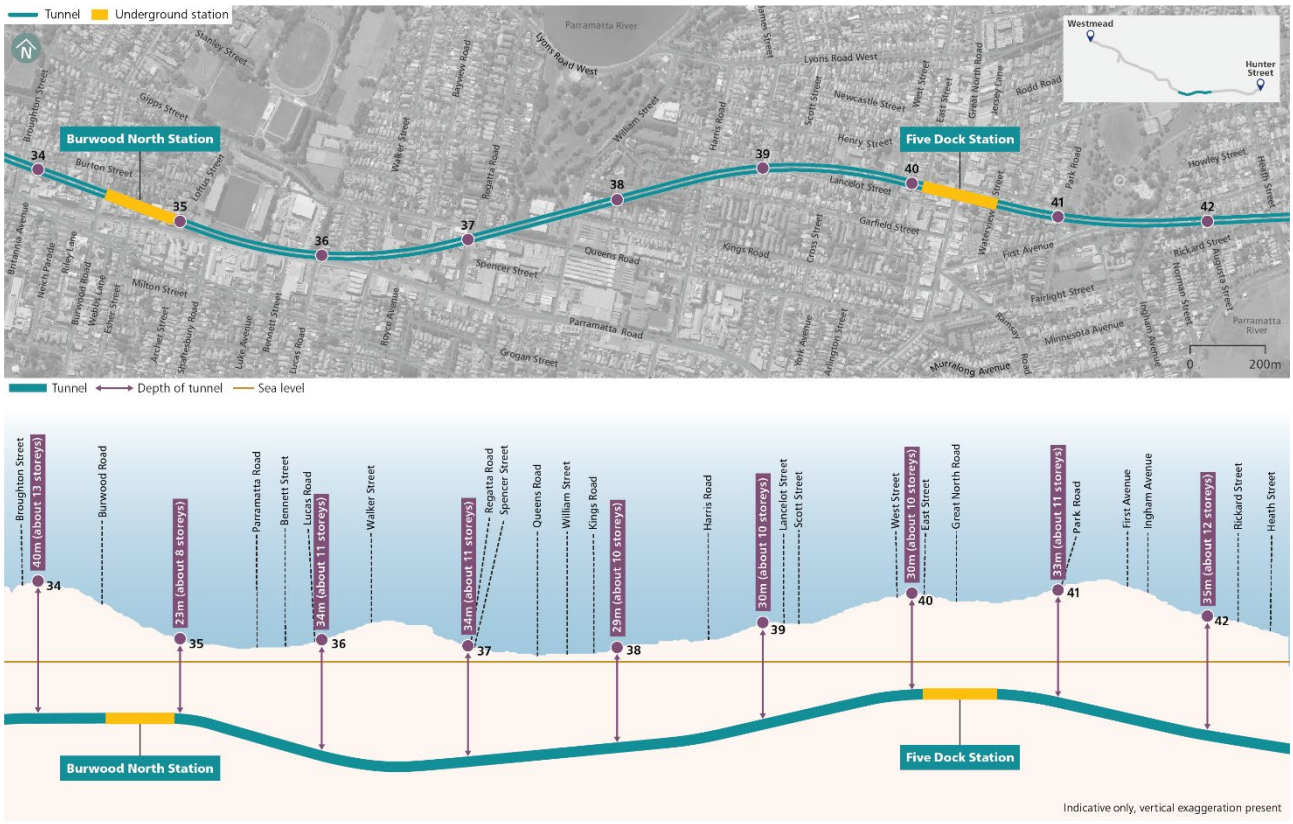


Figure 5-6 Indicative alignment plan and long section (5 of 8)

Figure 5-7 Indicative alignment plan and long section (6 of 8)

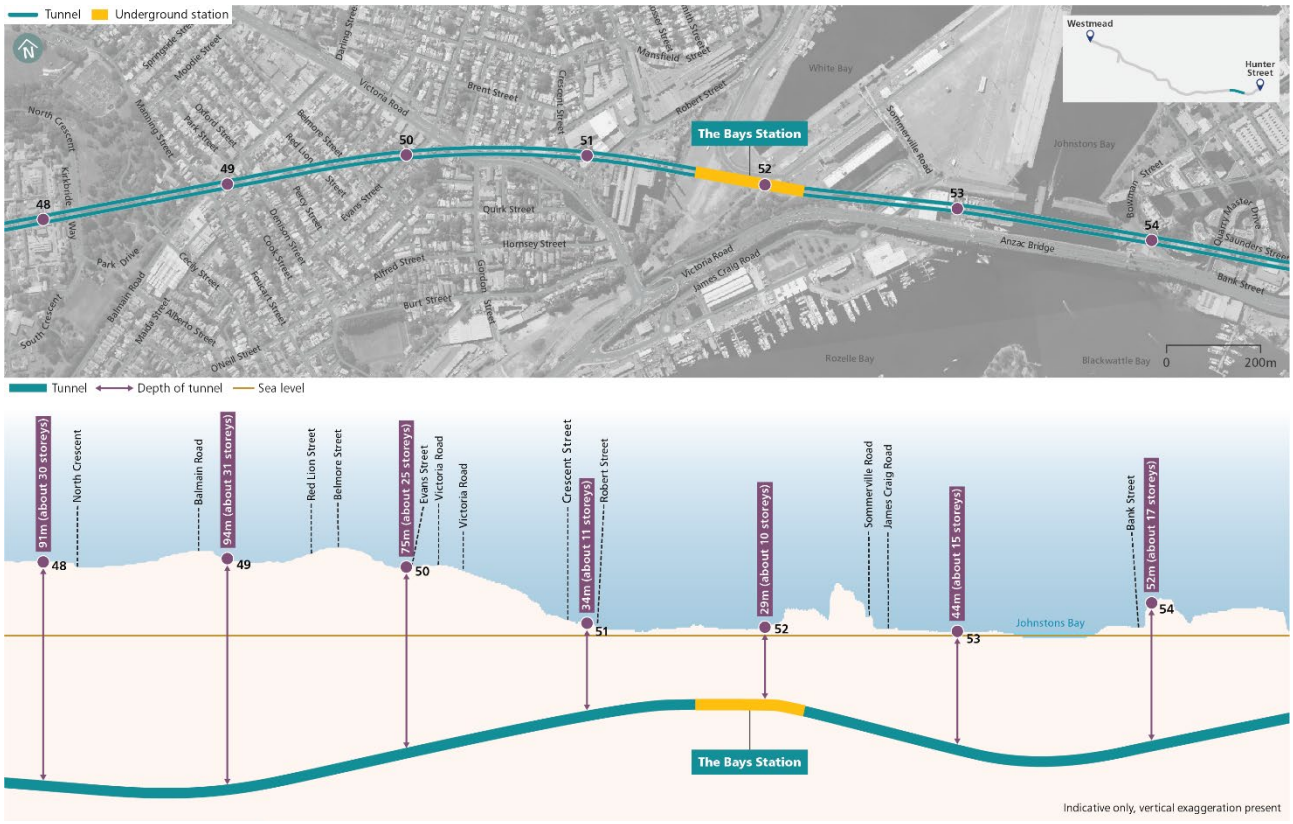


Figure 5-8 Indicative alignment plan and long section (7 of 8)

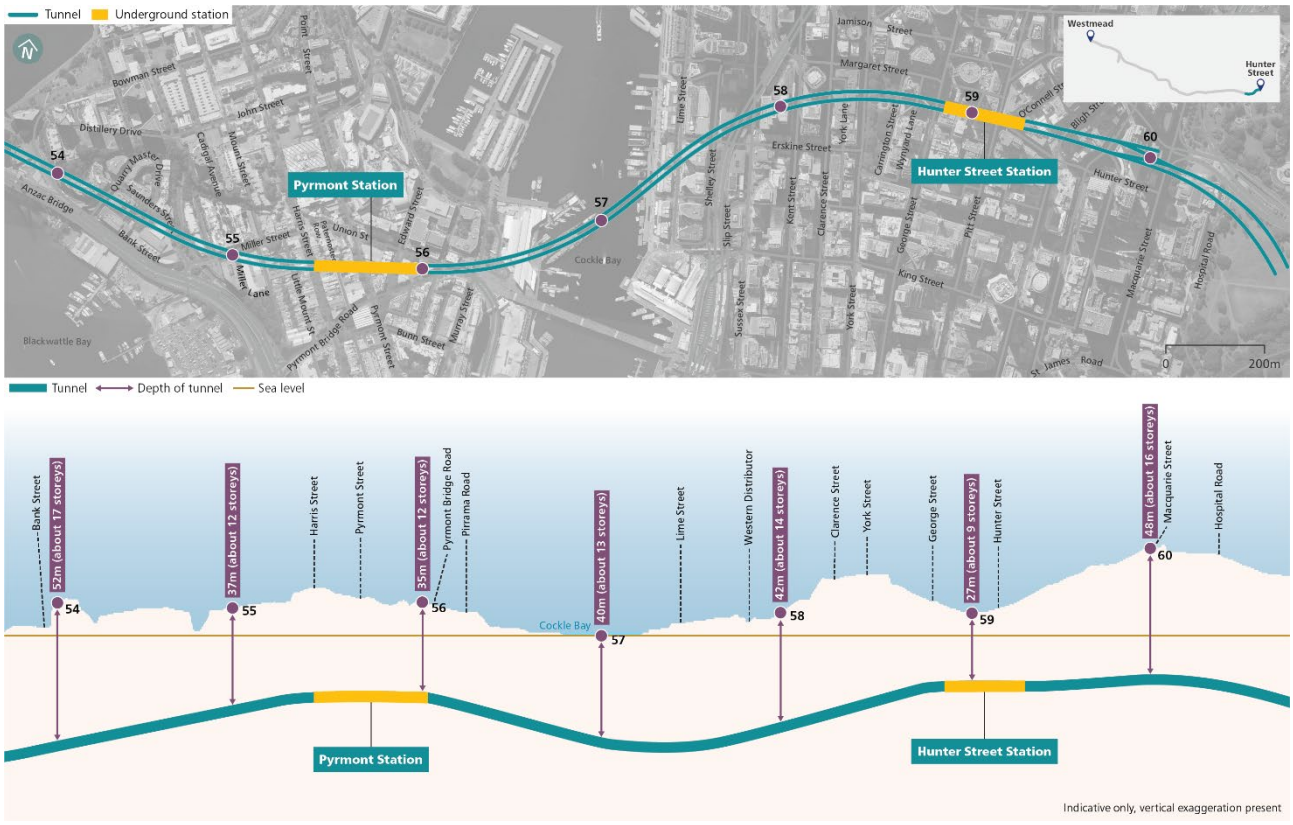


Figure 5-9 Indicative alignment plan and long section (8 of 8)

The proposed configuration of the metro tracks is shown in Figure 5-10.

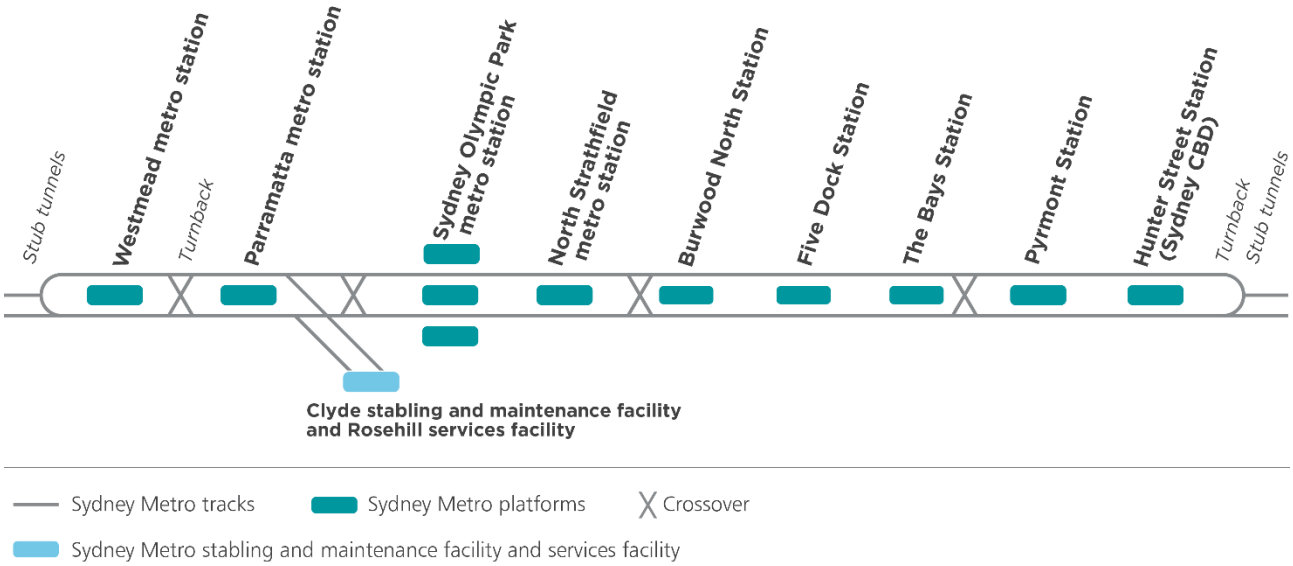


Figure 5-10 Indicative track configuration for Sydney Metro West

The track in tunnel would consist of a fixed concrete slab supporting continuously welded rail. The tunnels would also include other equipment and services including rail signalling, controls and communication, overhead traction power, fresh air ventilation, fire and life safety systems, maintenance access, lighting and drainage.

Sydney Metro West would include turnbacks (to allow trains to change to the other set of tracks) at Westmead and in the Sydney CBD. Crossover points (a track crossing point that would enable a train to cross between two parallel tracks for use in degraded operations due to maintenance, breakdowns or other emergencies) would be provided at various points along the alignment.

Stub tunnels would be located at the western and eastern extents of the tunnels to safeguard for potential future extensions. The provision of stub tunnels would allow for minimal disruption of the operating line during the construction of future extensions.

Emergency tunnel access and exit

An emergency egress strategy would be implemented that allows emergency access and egress from trains throughout the tunnel sections of the alignment. Low level walkways would be provided so that customers could evacuate from the tunnels in an emergency.

To facilitate emergency access and exit between the two tunnels, cross passages would be provided and spaced subject to ground conditions, engineering constraints, and fire and life safety requirements.

Figure 5-11 shows an indicative section of a typical cross passage.

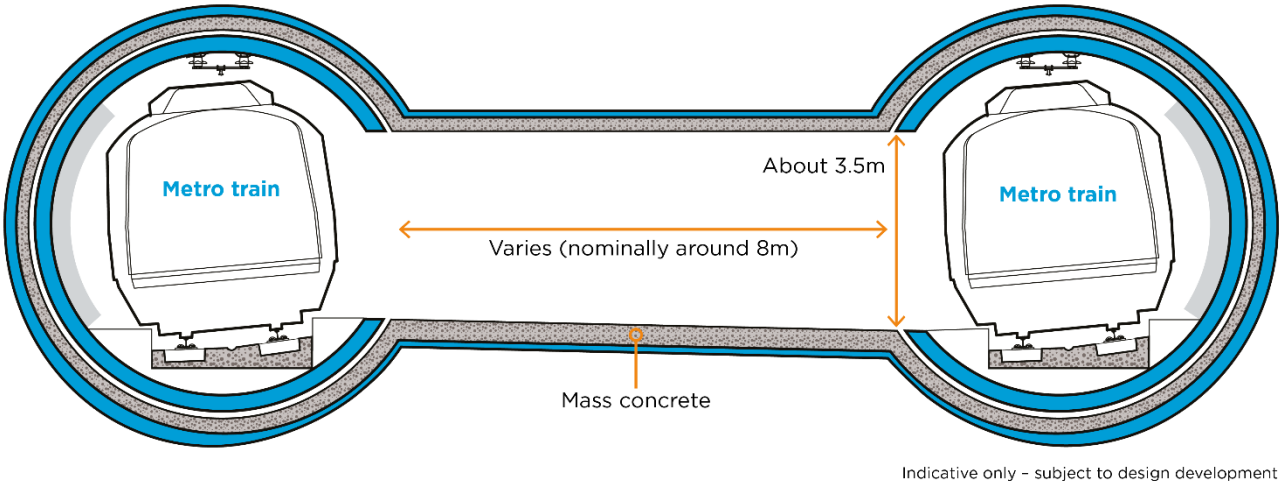


Figure 5-11 Indicative section of a cross passage

5.4 Stations

5.4.1 Station typologies

Metro stations would be located at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock, The Bays, Pyrmont and Hunter Street (Sydney CBD). All stations would be located underground.

Two main station typologies have been identified for this proposal to best meet the proposed track alignment at each station location. These are:

- cut-and-cover stations at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North and The Bays
- cavern stations at Five Dock, Pyrmont and Hunter Street (Sydney CBD).

A description of a typical cut-and-cover station and typical cavern station, including the construction methodology for these station typologies, is provided in Section 9.4.3 of the *Sydney Metro West Environmental Impact Statement – Westmead to The Bays and Sydney CBD* (Sydney Metro, 2020a).

Metro stations would be designed to provide safe and efficient interchange between transport modes, including minimising conflicts between pedestrians, cyclists, buses and vehicles. The proposed interchange opportunities at each station are shown in Figure 5-12.

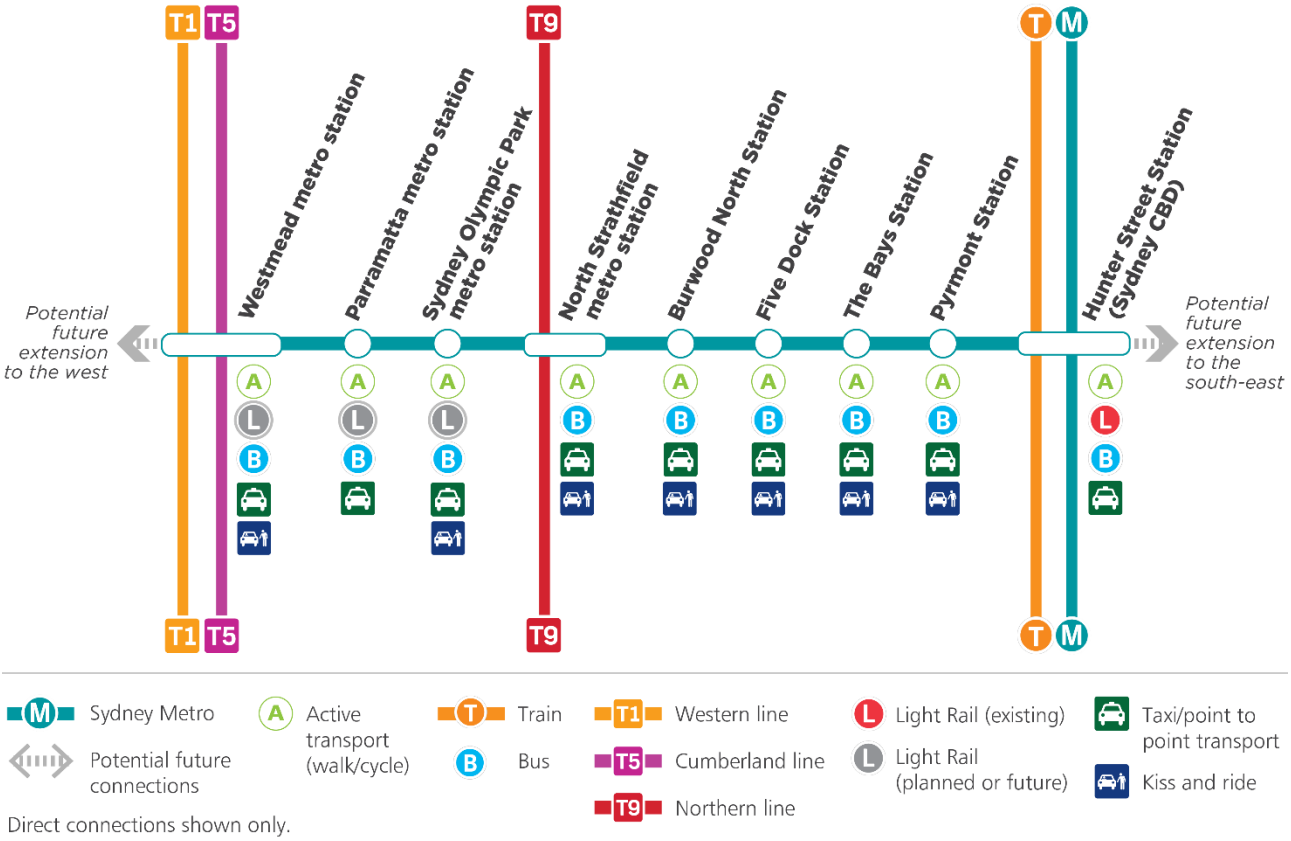


Figure 5-12 Proposed stations and direct transfer opportunities

5.4.2 Common station elements

Each metro station and precinct would have a number of common elements or design features. These would generally include:

- station concourses, including elements such as ticket vending machines, tap-on and tap-off infrastructure (such as ticket gates) and access to and from the platform and toilets
- platforms with elements such as seating, help points to enable customers to obtain emergency assistance, real-time customer information display screens and public address systems
- vertical transport, including a combination of escalators, lifts and stairs
- emergency stairwell access (typically at the ends of each station)
- station services and utilities buildings/facilities
- structures and spaces for non-station uses such as retail, commercial and/or community facilities
- canopies and awnings for shade and shelter at street level station entries
- optimised station design to provide natural light and ventilation
- station access walkways and enhancements to the footpaths in the vicinity of the station entries, as required
- station transport interchanges with supporting infrastructure, such as bicycle parking facilities, bus stops, kiss and ride and point-to-point facilities
- signage and wayfinding within the station and the surrounding public domain
- access roads, road modifications and intersection treatments, stormwater infrastructure, and other ancillary facilities

- landscaping, public art, heritage interpretation and urban design features
- elements within the public domain for hostile vehicle management such as security bollards
- back of house areas for staff and to support operations maintenance.

A detailed station and precinct description for each station is provided in Chapter 7 (Westmead metro station) to Chapter 17 (Clyde stabling and maintenance facility and Rosehill services facility) of this Environmental Impact Statement.

This proposal would include subdivision of the relevant sites, for example to support over and/or adjacent station development. Refer to Section 5.7 for further detail.

5.4.3 Structures and spaces for non-station uses

Structures and spaces for non-station uses such as retail, commercial and/or community facilities would enable the activation of each station precinct and provide opportunities for positive social and business benefits. This would generally include construction of the structural building elements, and associated utilities and services. These structures and spaces would generally be provided within, around and above the station infrastructure and integrated within the overall design of the station. Further detail on the potential location for these at each station precinct are provided in the individual precinct chapters of this Environmental Impact Statement. Inclusion of these structures and spaces would ensure seamless design and integrated delivery of the desired place outcomes for each precinct.

Although the fit-out and use of these spaces would be subject to separate assessment (where required), these structures and spaces are being designed with the station so that operational servicing can be accommodated, to minimise impacts, and will be subject to relevant building codes and certification.

5.4.4 Provision for future over station development and adjacent station development

In addition to the spaces for non-station uses, new metro stations create opportunities for developments that provide for community needs and include consideration of relevant planning controls and local character. These over and/or adjacent station developments could provide for a range of uses such as community facilities, new homes, shops, restaurants and commercial office space.

Over station development refers to building(s) that could be built, subject to separate approval, above metro stations. Where this is planned, this proposal would include relevant provisions to enable future construction of over station development, for example:

- structural elements (steel and/or concrete) up to podium level, building grids, column loadings and building infrastructure to enable the future construction of over station development
- space for future lobbies, lift cores, access, parking, loading docks, building services and basements for future over station development
- subdivision (refer to Section 5.7 for further detail).

Adjacent station development refers to building(s) that could be built, subject to separate approval, within the vicinity of metro stations, generally on residual land required for construction that does not form part of the operational station footprint. These building(s) would not be directly above metro stations. Where this is planned, this proposal would include relevant provisions to enable future construction of adjacent station development, for example:

- utility connections to support future development
- access to future adjacent station development (for example, pedestrian and vehicle connections)
- shared public domain areas with metro stations
- subdivision (refer to Section 5.7 for further detail).

In the event that adjacent station developments have not commenced when Sydney Metro West commences operations, opportunities to provide temporary activation of these areas would be explored.

Provision for over station development would be made at Parramatta, Sydney Olympic Park, Pyrmont and Hunter Street (Sydney CBD). Provision for adjacent station development would be made at Westmead, Parramatta, Sydney Olympic Park, Burwood North and The Bays.

Design of the metro stations and precincts would take into account planned over and/or adjacent station development, so that future developments can be built efficiently and effectively.

Further details regarding elements incorporated into the station design for the purposes of providing for over and/or adjacent station developments are included for each station in Chapter 7 (Westmead metro station) to Chapter 15 (Hunter Street Station) of this Environmental Impact Statement. Over and/or adjacent station developments do not form part of this proposal and would be subject to separate assessment and approval.

5.4.5 Related development

The following related development set out below is not part of the State significant infrastructure that is the subject of this Environmental Impact Statement and for which approval is sought.

The potential impacts of this related development (although the detail of such development is not yet fully known) has been considered in the design of the infrastructure that is the subject of this Environmental Impact Statement.

Approval for the related development will be sought separately. The related development comprises:

- construction and operation of future over station development and/or adjacent station development at Westmead, Parramatta, Sydney Olympic Park, Burwood North, The Bays, Pyrmont and Hunter Street
- fit-out and use of structures and spaces for non-station use at the station precincts.

This related development would activate the station precincts and provide a range of uses, such as community facilities, new homes, shops, restaurants and commercial office space.

As identified in Section 5.2.3, integrating a mix of uses and development into the station precinct would contribute to the success of places by encouraging precinct activation and use of Sydney Metro West across different times of the day and week, creating opportunities to provide facilities that meet customer and community needs, allowing stations to successfully integrate into their urban context and to contribute positively to the character of places at the stations.

The fit-out and use of non-station structures and spaces is not part of the infrastructure assessed in this Environmental Impact Statement. However, the design and construction of the structures and spaces that will later be fitted out and used is part of the infrastructure and is assessed in this Environmental Impact Statement and includes operational requirements for the structures such as access and servicing. The delivery of these structures and spaces would also be undertaken in accordance with relevant requirements, such as the Building Code of Australia and other standards, and appropriate certification of these structures would be obtained where required.

The locations of proposed over station development and/or adjacent station development have been identified and, where appropriate, that development is being designed in an integrated manner with the proposed stations included in this Environmental Impact Statement to minimise its construction and operational impacts.

Full consideration of the potential environmental impacts of related development would be carried out as part of the relevant separate assessment and planning approval process. Where appropriate this would include, but not necessarily be limited to, assessment of:

- compliance with strategic and statutory plans
- urban design and built form
- view and visual impacts (including overshadowing)
- impacts on the public domain
- wind impacts
- heritage impacts
- traffic, access, and parking
- interface with the metro station
- utilities, infrastructure, and services
- ecologically sustainable development
- aeronautical impacts
- biodiversity
- noise and vibration impacts
- contamination

- construction management
- social and economic impacts
- safety and security
- development contributions
- design excellence
- impacts on adjoining properties
- residential amenity.

5.5 Operational ancillary infrastructure

5.5.1 Stabling and maintenance facility

Trains would be stabled and maintained at a dedicated facility. This would be an integrated facility incorporating most operational functions including the operations control centre and all infrastructure required to maintain the train fleet.

A stabling and maintenance facility would be located in the Clyde industrial area. The facility would operate 24 hours per day, seven days per week.

A detailed description of the Clyde stabling and maintenance facility during operation, including key features, stabling activities and train maintenance activities is provided in Chapter 17 (Clyde stabling and maintenance facility and Rosehill services facility) of this Environmental Impact Statement).

5.5.2 Services facility

A services facility would be located at Rosehill (within the Clyde stabling and maintenance facility) to provide fresh air ventilation to the tunnels and emergency egress. The services facility would include an aboveground building for mechanical, electrical and ventilation equipment, with a vertical shaft to connect to the tunnels below. Construction of the vertical shafts will be completed as part of the work under the previous Sydney Metro West planning application. The services facility could also include electrical rooms, fire systems, emergency lighting and signage, and ancillary rooms supporting the ventilation system and amenities for personnel. Further details regarding the Rosehill services facility are included in Chapter 17 (Clyde stabling and maintenance facility and Rosehill services facility) of this Environmental Impact Statement.

The need for a services facility at Silverwater, and between Five Dock and The Bays stations, was identified in the *Sydney Metro West Environmental Impact Statement – Westmead to The Bays and Sydney CBD* (Sydney Metro, 2020a). Following further detailed design work, Sydney Metro determined that ventilation can be adequately provided through enhancement of the ventilation system along the alignment and Sydney Metro West can be safely delivered without a services facility at Silverwater or between Five Dock and The Bays stations. Sydney Metro would continue to investigate opportunities for utilising the Silverwater site (as identified in the previous Sydney Metro West planning applications) to support the construction and operation of Sydney Metro West.

5.5.3 Substations and traction power supply

The power supply for Sydney Metro West would be designed to operate as an independent standalone system. All Sydney Metro West traction power supply infrastructure would be controlled and monitored from the Operations Control Centre at the Clyde stabling and maintenance facility.

Traction power supply would be provided through dedicated traction power substations and supporting feeder line cables. Substations would be provided at the following locations:

- a traction substation at Rosehill services facility
- a traction substation at The Bays (south of the White Bay Power Station).

The substation sites would generally include mechanical and electrical equipment such as 132 kilovolt high voltage network, gas insulated switchgear, transformers, gas exhaust systems and mechanical cooling systems. The sites would include fencing and security measures to prevent public access.

The provision of additional local power supply to the stations may be required as part of this proposal for the operation of Sydney Metro West. Where required, utility connections would be made to the nearest substations, with works retained to the road reserve where possible. Further investigation into the need for this additional power supply would be undertaken during detailed design.

5.5.4 Metro rail systems

Signalling and train control

Similar to the operation of the Metro North West Line, Sydney Metro West would use advanced signalling technology to support safe operations and control the way trains accelerate and brake at stations. The signalling system would keep each train within a safe braking distance of the train ahead, control speed between stations and the opening and closing of train doors.

The signalling and train control system would consist of:

- automatic train protection which would provide train spacing and speed monitoring and control functionality
- automatic train control, which would monitor and adjust train speeds and station dwell times to maintain timetable and spacing between trains
- automatic train operation, which would provide automated train driving functionality.

The signalling system would control the stopping of trains at stations, ensure trains stop at the correct location on the platform (including lining trains up with platform screen doors), control train speed between stations, and initiate the opening and closing of doors on the correct side of the train.

The signalling system would allow for bi-directional operation (that is, trains would run in either direction on either track) in special circumstances. This would provide functionality to respond to a range of incidents to support continuity of service. All control systems would be integrated with rail systems to provide consistent performance and high levels of safety.

Communications

Sydney Metro West would include an integrated information and digital communication system. This would allow communication for operations purposes, and between customers and metro staff via audio and visual links at each station and on all trains. The communications equipment would be within the designated services area at each station, within the proposed tunnels and at the Clyde stabling and maintenance facility.

The communications system would comprise:

- customer information display and public address system
- customer mobile telephone and other modern telecommunication methods (at stations and on trains within tunnels)
- ticketing system (refer to Section 5.6.3)
- closed-circuit television system and video broadcasting system
- radio communications systems for operator and emergency services
- emergency warning information system
- digital voice video recording system
- telephone system and personnel wireless terminal
- access control and trackside intruder detection system.

5.5.5 Ventilation system

A tunnel ventilation system would be provided to allow for a range of ventilation requirements including fresh air in tunnels and stations, and ventilation for fire and life safety and operational scenarios.

During normal operations, ventilation of the tunnels would be provided through the draught relief shafts (which operate passively through the movement of trains in the tunnel) and the operation of ventilation fans at the stations to exhaust air from the tunnels. Tunnel ventilation fans are not expected to be used during normal train operations. However, tunnel ventilation fans could be operated to provide additional heat removal particularly during periods of train service disruption in summer conditions. Typically, the direction of ventilation would be the direction of train travel; however, the system would be designed to allow for ventilation in both directions.

Separate mechanical ventilation systems would be provided at each underground station for heat removal and to provide fresh air. Full height platform screen doors at stations would assist in controlling underground station temperatures by physically separating the tunnel and station environments.

The services facility proposed at Rosehill is located directly above the tunnel alignment and would typically include tunnel ventilation plant rooms and associated equipment. The tunnel ventilation system at the services facility would operate to provide additional heat removal, particularly during periods of train service disruption but is not expected to be used during normal train operations.

The services facility would also allow for inclusion of mechanical and electrical equipment and ancillary rooms to support the ventilation system. A stair shaft would be provided to connect to the tunnels below for maintenance personnel.

In the event of a tunnel fire, the tunnel ventilation system would generate longitudinal flow and would extract smoke to prevent smoke building up in the area of the fire. Smoke-laden air would be discharged via ventilation outlets at stations or the services facility, depending on the location of the fire.

5.5.6 Drainage and stormwater

This proposal would include a series of drainage works so that stormwater is efficiently conveyed to the surrounding stormwater drainage system. The proposed track drainage system would include new drainage infrastructure for the tunnel and surface sections of this proposal.

The drainage infrastructure would consist of trunk stormwater drainage, track drainage, onsite detention and various discharge points. Once constructed the stations, tunnels and dive structure portals and retaining walls would generally comprise tanked structures (which prevent groundwater from entering the structure but do not actively drain groundwater).

Within the tunnels, drainage depressions would be incorporated into the concrete slabs that form the base for the rail track. The tunnel portals and other critical locations, such as stations and the stabling and maintenance facility, would be designed to be protected from the Probable Maximum Flood level or be 0.5 metres above the one per cent Annual Exceedance Probability flood level (whichever is greater).

An operational water treatment plant would be provided at the Clyde stabling and maintenance facility to treat wastewater pumped from the tunnels, stations and other underground facilities. The water treatment plant building would include holding tanks, chemical treatment tanks and filters. Treated water would be discharged towards Duck Creek. During an emergency situation, there may be a need for water to bypass the operational water treatment plant and be discharged untreated to the receiving environment.

5.6 Proposed operations

This section provides a description of the operation of this proposal in the context of the broader Sydney Metro network.

5.6.1 Service frequency and reliability

As with the broader Sydney Metro network, this proposal would deliver a ‘turn up and go’ service stopping at all stations along Sydney Metro West.

The indicative service frequency for Sydney Metro West at opening between Westmead and the Sydney CBD would be:

- at least every four minutes during the morning and evening peaks on a typical weekday
- every 5 minutes during the day on a typical weekday
- every 10 minutes during early morning and late at night on a typical weekday, and on weekends.

Demand for the service would be managed through increased service frequency. The ultimate operational frequency would be for 30 trains per hour in each direction – a train every two minutes each way.

Operations would be tailored to cater for planned special events, for example major events at Sydney Olympic Park or New Year’s Eve. Details for special event operations would be determined during the design development process.

5.6.2 Hours of operation

The hours of operation would be aligned to the Sydney Trains suburban rail network and the Sydney Metro network. It is anticipated that Sydney Metro West would generally operate from early morning to late at night. To accommodate for planned special events, operating hours could be extended as required.

Final operating hours would be determined as part of the development of service schedules for the metro line, taking into account maintenance access requirements, customer requirements and broader network considerations.

The Clyde stabling and maintenance facility would operate 24 hours a day, seven days a week.

5.6.3 Train types

All trains would be new, single-deck, fully automated and driverless metro trains. They would deliver a fast, safe and reliable journey for customers with high performance standards and good customer amenities including:

- at least three doors per side per carriage and no doors between carriages, allowing fast boarding and alighting
- level access between the platform and train
- a mix of seating and standing arrangements for efficient boarding and alighting
- accessible priority seating for people with mobility impairments, people with a disability or using a wheelchair or mobility device, the elderly and people with prams
- allocated multi-purpose areas on each train for prams, bicycles and customers travelling with luggage
- air-conditioned carriages
- emergency help points
- clear customer information while on board, including passenger information screens.

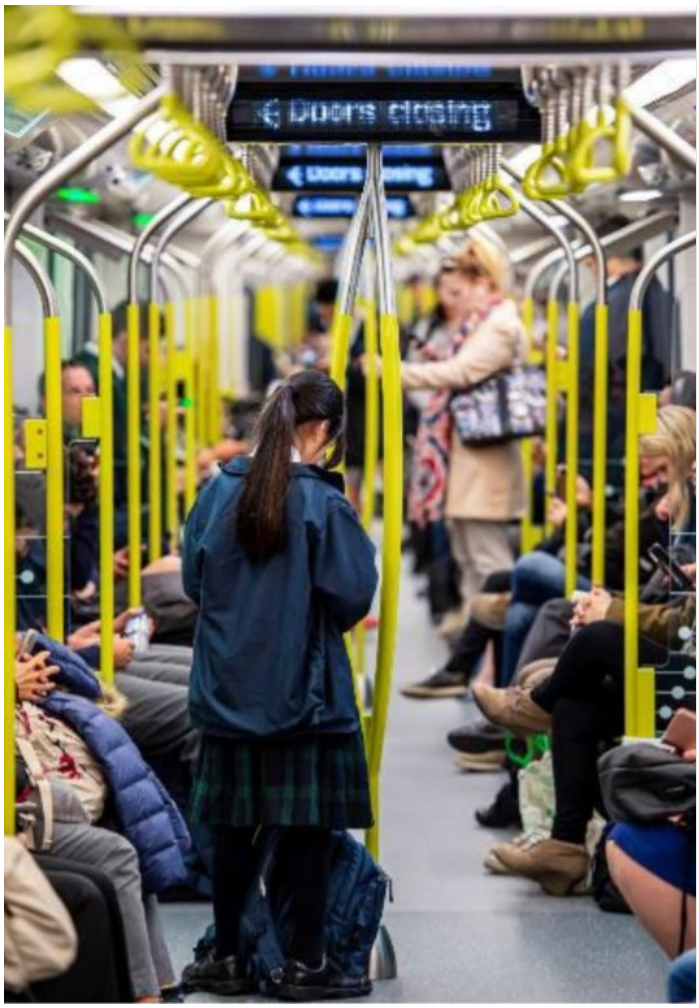
Photographs of the indicative type of trains proposed are provided in Figure 5-13, Figure 5-14 and Figure 5-15.

Source: Sydney Metro

Figure 5-13 Photograph of a metro train operating on the Metro North West Line

Source: Sydney Metro

Figure 5-14 Photograph of a metro train at an underground station on the Metro North West Line



Source: Sydney Metro

Figure 5-15 Photograph of an internal metro train carriage

5.6.4 Ticketing

This proposal would be integrated with the existing Opal electronic ticketing system, which would allow for a ticketing system integrated with all other modes of public transport (Sydney Trains operated trains, buses, ferries, and light rail services). This system would be installed at all stations.

Fares for Sydney Metro would be set by the NSW Government. Ticket pricing for all transport in NSW is determined by the Independent Pricing and Regulatory Tribunal of New South Wales (IPART), and by NSW Government policy. The NSW Government reviews this pricing annually and may consider a change to the Opal policy at any time. Sydney Metro service pricing would be reviewed in line with the pricing review process for other forms of public transport.

5.6.5 Operational staff

Sydney Metro West staff would provide assistance to customers in person throughout stations and trains.

It is anticipated that about 70 to 90 staff members would be required per shift to operate and maintain this proposal. The final arrangement of staffing to operate this proposal would be determined as part of future operator requirements.

5.6.6 Maintenance activities

The maintenance philosophy for Sydney Metro West would be to ensure safety and maintain the functional performance of the railway.

Maintenance planning would generally allow for routine and major periodic maintenance of infrastructure with a view to maximising service availability and minimising impacts on customers. Scheduled maintenance would generally occur between the last and first train services, or during planned weekend maintenance periods, when train services would not be in operation on parts of the line.

Rail maintenance vehicles would be able to use the metro network and provide access for maintenance crews. Track monitoring equipment may also be used on metro trains to support maintenance activities. The following types of maintenance activities would be required:

- scheduled maintenance – involving routine inspections and repairs to enable operations at prescribed levels of safety, reliability and service frequency; this type of maintenance would be performed on a regular and recurring basis at specified intervals
- non-scheduled maintenance – involving emergency repairs, or repairs due to vandalism and breakage that would impact on prescribed levels of safety, reliability and/or service frequency; this type of maintenance would be performed as needed
- overhaul and repairs – involving the repair, replacement and testing of infrastructure that has been removed from its working location.

5.7 Subdivision

This proposal includes subdivision of the relevant sites, including the station precincts and ancillary facilities as required to allow for separate occupation or development of parts of the land within the station precincts. Subdivision may be carried out to divide land for the purposes of (but not necessarily limited to):

- the station
- the spaces to be used for non-station uses
- over station development (including within and between the over station development(s) and elements at and below ground level)
- adjacent station development
- public roads and public open space
- the management of residual land.