3.1.4 Comfort and Amenity

Relevant Design Objectives

1	Ensuring an easy customer experience

Principle

Provide a comfortable customer environment that provides sufficient personal space and amenity and is well lit with effective and appropriate microclimate amenity for all users.

Guidelines

- Station entry orientation and design are to minimise adverse micro climate effects including wind tunnel impacts.
- Customer weather protection outside Sydney Metro stations is to be provided to ensure good levels of customer comfort are maintained and to provide useable spaces at ground level.
- A range of customer facilities and amenities is to be provided to grow patronage by making public transport a more attractive choice.
- A high level of amenity and security in customer waiting areas is to be provided to positively influence patronage and perceptions of the public transport system.
- Waiting areas, pedestrian walkways and cycle ways are to have adequate shade and day and night time lighting, while minimising energy consumption, providing an appropriate balance between sun access in winter and shade in summer.
- Minimise urban heat island effect through light coloured finishes, roofs and pavements, green walls, roofs, plantings and shade trees.

Chatswood Transport Interchange. Waiting and circulation areas outside the station entry are weather protected and have a high level of amenity and customer facilities.
Architect: CoxDesignInc.
Source: Cox Richardson, Photographer: John Gollings

9 Castlereagh Street, Sydney. Landscaped spaces provide shade in waiting areas.
Architect: Harry Seidler & Associates.
Source: Cox Richardson

3.1.5 Customer Safety

Relevant Design Objectives

1	Ensuring an easy customer experience

Principle

Ensure stations and precincts provide a safe and secure environment for customers and also contribute to the overall public safety of urban places throughout the day and night.

Guidelines

General

- Safety issues are to be embedded in the design development process and optimised through the application of relevant Crime Prevention through Environmental Design (CPTED) principles and guidelines.
- Operators are to be consulted to advise on issues such as lighting, lines of sight and CCTV, based on their network experience.
- Integrated CCTV systems must be provided at entry and exits, stairways, ramps, bridges, tunnels, lifts, ticket office and vending machines, emergency help points, public telephones, waiting and seating areas in accordance with Australian Standards and Sydney Metro requirements.
- Vandal-resistant fittings and fixtures are to be used throughout.

Public Domain

- An initial CPTED review of station precincts is to assess activity generators, edge effects, movement predictors, conflicting user groups, crime hotspots, the 'displacement phenomenon' and building elements
- All public domain areas are to be planned with guidance from CPTED experts, adopt a risk prevention design approach and eliminate entrapment and concealed space opportunities.
- A Crime Risk Assessment audit must be applied to the precinct design to ensure that all precinct areas comply with CPTED guidelines.

Chatswood Transport Interchange, NSW. Design of the public domain enables passive surveillance with clear sight lines through the station areas. Architect: CoxDesignInc.
Source: Cox Richardson

Stations

- The station design is to incorporate CPTED strategies:
  - Eliminating hidden spaces, recesses or voids that could provide a person with the ability to conceal themself or others from general view.
  - Secured stations out of operating hours and during emergencies.
  - Ticket Vending Machines (TVMs) positioned to allow surveillance.
  - Minimising inadvertent or intentional access to hazardous or unauthorised areas of the station.
  - Physical barriers to minimise the risk of trespass or self-harm by station users.
  - Protective screening to elevated walkways and concourse areas particularly where persons traverse above or immediately adjacent to the rail corridor.
  - Glazed lift car and lift shaft enclosures to maximise visibility and safety.
- Station designs are to support visible staff presence as close as possible to customer movement and decision making zones to enhance customer safety.
- The stations are to be designed to minimise obstructions and projections, providing clear routes for customers.
- Station designs are to eliminate crush zones and provide equipment at safe and accessible locations.

Help Points

- Help points should be easily identifiable, accessible components integrated into station cladding systems
- Help point enclosures should be integrated with the surrounding wall or equipment cabinet.

Macquarie Park Station, NSW. Glass sided lifts enable passive surveillance and sight lines through to the concourse.
Architect: Hassell
Source: Cox Richardson

3.1.6 Accessibility

Relevant Design Objectives

1	Ensuring an easy customer experience
2	Being part of a fully integrated transport system

Principle

Ensure the stations and associated spaces are safe, efficient, universally accessible, legible and easy for customers and pedestrians.

Guidelines

- Stations and precincts are to be easy, safe and accessible for all to use including the elderly, customers with disabilities, young children and those with prams and luggage.
- As far as possible, pedestrian pathways are to be obstacle and step free to maximise access for all customers. Where the use of stairs cannot be avoided, then they must be easy and safe to use.
- Where obstacles to universal access are unavoidable, clearly legible alternative routes must be provided as close as possible to the main travel path.
- Where the use of stairs is unavoidable, clearly legible, alternative accessible circulation routes are to be provided. These alternatives are to be as close as possible and not isolated from the primary circulation route.
- Where lifts and escalators are provided as an alternative to stair access they are not to result in a longer journey than the primary circulation route or compromise the safety of customers who need to use them.
- Ramps may provide opportunities for universal access; however, where possible, seek alternative means of effecting level changes, for example, by altering the path of travel.
- All facilities, furniture and fixings must be designed to be accessible to all customers. Accessible and ambulant toilets must be provided.
- Priority seats and adequate space should be provided in waiting areas and groups of seating to accommodate the elderly and customers with disabilities and prams.
- Information must be provided throughout the customer journey that considers user impairment, culture and language.
- Equivalent service and safety information must be provided for customers with disabilities in their preferred accessible format.
- Public transport information should be provided across a range of multimedia technologies including mobile phones, audio and visual and tactile signage, assisted listening for the hearing impaired and near field technologies to optimise accessibility for all users.
- The use of international icon protocols, colour coding and other graphic devices should also be considered to minimise the use of text-based signage and language difficulties.
- Comply with Disability Standards for Accessible Public Transport.
- All Metro service elements must comply with the Disability Discrimination Act 1992 and associated Public Transport and Premise Standards.

Universal access must be provided to all stations and precinct facilities.
Source: San Francisco Municipal Transportation Agency

Universal access must cater to customers with a wide range of disabilities.
Source: TfNSW

3.2 Identity

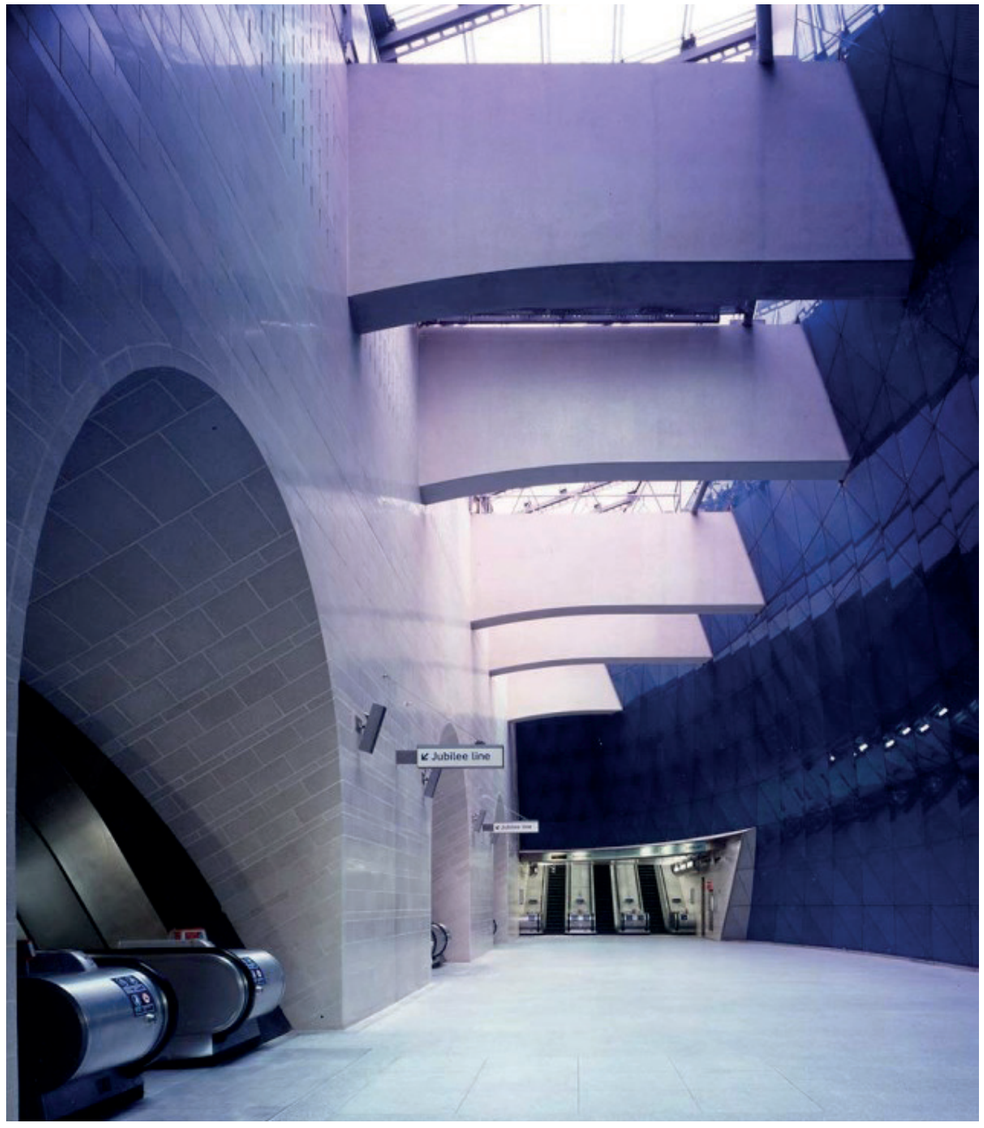
For a project of this importance it is imperative that the design delivers not just on the project objectives but provides an architectural and urban design experience that connects with the city and its diverse communities so that they embrace and identify with the project, the rail line and the opportunities it unlocks.

All of the public transport infrastructure is public space, so internal and external spaces of the stations are public realm. Having a consistent theme binds the internal and external areas integrating paid and unpaid areas and helps the station to integrate within its local context. The station entrances need to engage with their local context to create welcoming landmarks in the urban environment.

A major design objective is the achievement of a 'whole-of-corridor' identity for Sydney Metro. In this respect the design strategies in this section all contribute to the character, appearance, accessibility and function of the stations and their surrounding precincts. A unified approach can be fostered through adherence to common strategies for buildings and structures, finishes, accessibility and legibility that respond to local contexts while forming part of a 'whole-of-corridor' identity.

This part of the document provides guidelines for the following areas of creating a Sydney Metro identity:

- Network and Station Legibility
- Place Making
- Heritage & Archaeology
- Environment & Sustainability
- Art
- Lighting



Southwark Station, London. Station spaces are designed as distinctive, high quality public domain.
Architect: MPJ Architects
Source: MPJ Architects

3.2.1 Network and Station Legibility

Relevant Design Objectives

1	Ensuring an easy customer experience
2	Being part of a fully integrated transport system
4	Being responsive to distinct contexts and communities

Principle

Create a line-wide identity for the Chatswood to Sydenham project that is recognisably part of the Sydney Metro network while enabling elements of station design to respond to context, character and environment to create locally distinctive sustainable outcomes.

Guidelines

- A line-wide identity is to be established through the architectural language and layout of the station types (cut and cover, single cavern, binocular cavern).
- The architectural language and elements of the transport infrastructure and stations are to form a line-wide design that reinforces the Sydney Metro identity within the broader transport network.
- The stations are to maintain a coherent identity with consideration of:
  - Network identity
  - Line-wide identity
  - Station-specific local identity.
- Station buildings, service facilities, public domain elements and component elements are all to form part of the identity and project an image which evokes a modern, contemporary and efficient transport system providing an attractive, comfortable, safe and inspiring customer environment, while also responding to the local context and environment.

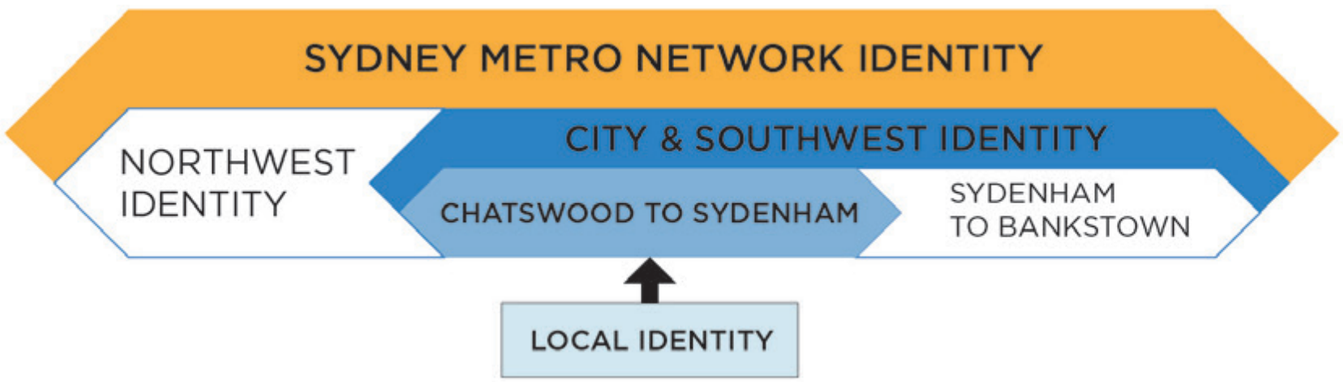


Diagram highlighting the various layers of identity that should be considered in the design.

Kings Cross Station, London. Clear signage contributes to network and station legibility. The architectural quality of the space creates an attractive place for customers with a local identity.
Architect: John McAslan + Partners
Source: Cox Richardson

3.2.2 Place-making

Relevant Design Objectives

1	Ensuring an easy customer experience
3	Being a catalyst for positive change

Principle

Create welcoming, secure and well maintained public domain spaces and station buildings with an attractive 'sense of place'.

Guidelines

- Stations and associated spaces are to promote a welcoming image or identity that reinforces a positive sense of place.
- Station plazas are to be designed as an extension of the internal station environment providing shelter, comfort, safety and security for customers, and contributing positively to customer journey experiences. These spaces are to reflect the local public realm context and character.
- The enhancement of station spaces can be achieved by introducing a range of uses, services and facilities such as retail, food and beverage, shade trees, landscaping and public art.
- Create public spaces which allow for spontaneous uses and activities by their occupants.
- Use opportunities to facilitate active uses and informal recreation.
- Consider opportunities for temporary event, pop ups, retail spaces and the night time economy.
- Station public spaces are to be designed with a consistent hierarchy of landscape treatments. The treatment of these spaces is to reflect local character and context, integrate within their settings, and provide attractive space and streetscapes.
- Fixtures, including furniture and lighting, are to enrich site context and sense of place and contribute to wayfinding.
- A coordinated lighting approach is to create aesthetic consistency across Sydney Metro by defining station address, public domain areas and attracting customer into station forecourts and plazas.
- A positive precinct image is to be developed around the particular heritage values of a place or by the qualities of the existing urban context.

'Solar Tree' St John's Square, London
Artist: Ross Lovegrove
Source: Ross Lovegrove

3.2.3 Heritage and Archaeology

Relevant Design Objectives	
4	Being responsive to distinct contexts and communities
5	Delivering an enduring and sustainable legacy for Sydney

Principle

Ensure elements and items of heritage significance are appropriately managed and respected. Identify opportunities for heritage conservation to contribute to the celebration of local identity in station design.

Guidelines

- Sydney Metro is to be fully integrated within, and sensitive to, its heritage context. This includes built and natural heritage, European and Indigenous archaeology and may include places, buildings, works, relics, moveable objects or precincts.
- Where Sydney Metro intervenes in or interfaces with heritage places (such as Central Station or Martin Place), design excellence is to be sought to support inventive, interpretive and contemporary responses to the heritage values of that place.
- Where appropriate, the design of the rail corridor and station precincts are to integrate and conserve existing heritage items and mitigate any negative impacts.
- Actively anticipate the research, site investigation, salvage and culturally appropriate safekeeping of Indigenous heritage uncovered by the Sydney Metro project.
- New work is to be based on an understanding of the heritage significance of heritage items, heritage conservation areas and places and is also to take into consideration:
  - Siting - including urban grain, streetscape rhythm, setbacks, orientation and address of buildings, location of boundary walls, key views, significant natural features and archaeological remains,
  - Scale - including wall and floor to floor heights, modulation and façade rhythms, massing, density, proportions, relationship to ground plane, wall modulation including openings and roof planes,
  - Form – including proportion and number of openings, solid to void ratios, roof form, skyline and relationship between internal and external spaces,
  - Materials and colour – giving consideration to characteristic materials, textures, colours, light and shadow,
  - Details – creating complementary relationships between new and old elements to provide visual interest.
- Consideration is to be given to integrating heritage interpretation with Public Art.
- Retaining or interpreting heritage fabric is to be viewed as a means of defining local identity.
- For new underground stations, archaeological material, features and deposits may need to be considered.

Newtown Station, Sydney. Heritage interpretation.
Architect: NSW Government Architects Office/Caldis Cook Group.
Source: TfNSW

St Pancras Station, London. Heritage building has been enhanced to accommodate new rail requirements.
Architect: Alistair Lansley
Source: Visit London

3.2.4 Environment and Sustainability

Relevant Design Objectives

5	Delivering an enduring and sustainable legacy for Sydney

Principle

Ensure best practice sustainable design solutions are adopted for the public domain, stations and buildings, to minimise environmental impacts and benefit customers and local communities.

Guidelines

- Achieve a high level of performance using sustainable design rating systems.
- Adopt energy efficient and low carbon design solutions that minimise the carbon intensity of the project.
- Incorporate passive design solutions to optimise solar access, introduce daylight, and maximise natural ventilation.
- Harness both direct and indirect daylight to minimise energy consumption in lighting, while creating a light and airy ambience in stations and surface buildings.
- Utilise energy efficient lighting and lighting control systems.
- Ensure resilience to climate change, by incorporating climate change adaptation measures which respond to weather extremes, including flood risk, and temperature increases.
- Provide a positive journey experience in station precincts by protecting users from the potential negative impacts of extreme weather.
- Ensure designs respond to the local microclimate and incorporate opportunities to reduce heat island effects, including (as appropriate) light coloured finishes, roofs and pavements, green walls or roofs, plantings, and shade trees.
- Include integration of renewable energy sources at stations and in the public domain where feasible.
- Consider water efficiency in design, utilising water from recycled sources where appropriate.
- Opportunities for collection, treatment, storage and reuse of rainwater from station roofs, canopies and other surfaces are to be considered where practicable within the urban environment.
- Water Sensitive Urban Design (WSUD) initiatives are to include an integrated and site-responsive range of design solutions, influenced by urban design considerations and be adaptable into the future.
- Minimise materials consumption, and reduce embodied energy and impacts in materials selection.
- Prioritise reuse of materials, use of recycled materials, and selection of materials from sustainable sources.
- Use durable, climate resilient, long life, healthy, low maintenance materials.
- Minimise materials consumption, and reduce embodied energy and impacts in materials selection.
- Maximise opportunities for beneficial reuse of spoil in landscape features and other uses.
- Provide noise control measures to ensure appropriate and comfortable acoustic conditions for users.
- Minimise waste through efficient design and material selections.

Central Park, Sydney. Landscaped facade treatment helps cool the microclimate.
Architect: Jean Nouvel
Source: Cox Richardson

3.2.5 Art

Relevant Design Objectives

1	Ensuring an easy customer experience
4	Being responsive to distinct contexts and communities

Principle

Ensure public art is integrated within the design of stations and other corridor structures to aid place-making and to enhance local amenity and celebrate local character.

Guidelines

- Public art is to be a key feature of the customer experience, bringing joy to customers and adding value to the operation and success of Sydney Metro by contributing to station identity, beauty, amenity, wayfinding, safety, security, community values and the public domain.
- Public art is to be integrated into the station and building designs to enliven and enrich the public realm and contribute to a sense of place.
- Public art is to be integrated but separate from the architecture, budgeted and managed from the architectural scope.
- The design and location of art works is to be coordinated within the broader urban context of city stations and be reflective of the distinctive character of each place.
- Consider the re-installation of artworks present in existing buildings or streets to be changed as part of Sydney Metro works.
- Artworks are to contribute to the cultural identity of precincts and neighbourhoods and are to be developed in consultation with the local community and stakeholders.
- Maximise community involvement/representation/ownership in public art.
- Art works must be located to support the safe intermodal function of precincts around Metro stations.
- In station concourse and precinct areas, appropriate integration is required of permanent artworks with station wayfinding, information and other customer amenities.

Artwork may also be incorporated into the public realm as part of a building element.
Artist: Bronwyn Bancroft.
Source: TfNSW

Georg-Brauchle-Ring Station, Munich U-Bahn, Germany. Artwork on the trackside walls gives the station a distinctive identity and facilitates wayfinding.
Artist: Franz Ackermann
Source: Wikipedia

3.2.6 Lighting

Relevant Design Objectives

1	Ensuring an easy customer experience
4	Being responsive to distinct contexts and communities

Principle

Ensure a coordinated approach to lighting that responds to the local context, addresses CPTED and operational requirements and provides feature lighting representative of the Sydney Metro image. Use light to enhance station built form and corridor landscape, whilst delivering functional lighting and creating a safe and high quality experience for all users.

Guidelines

General

- Lighting is to integrate with access, wayfinding and public art strategies.
- Lighting is to reinforce the visibility of station entries as safe and welcoming elements within the local context at night.
- Illumination levels are to be appropriate to the task, be it wayfinding, reading tasks and facial recognition, while creating visual interest within the stations.
- Glare and visual discomfort is to be eliminated through appropriate specification and positioning of luminaires.
- The number of luminaires is to be minimised to aid maintenance and sustainable aspirations.
- A coordinated lighting approach is to provide aesthetic consistency across Sydney Metro by defining station address, public domain areas and attracting customers into station precincts.
- Provide market leading energy efficient lighting and lighting control systems.

Public Domain

- Lighting at station precincts and facilities must provide a safe, secure, legible and comfortable environment for all operators and users.
- Provide public space lighting to facilitate diverse uses including night time use of public spaces.
- Station precincts are to be defined by the application of an iconic, consistent, multi-functional pole and luminaire system, as for example at Epping to Chatswood Rail Line stations in Sydney.
- To eliminate unnecessary clutter, lighting must be coordinated with all other public domain elements.
- Lighting within station precincts is to celebrate the station address and pedestrian links with lighting systems that are of an appropriate scale, different to that which defines the precinct streets and street frontages.

Stations

- Lighting is to complement the architectural design and seek to provide an appropriate balance of artificial and daylight.
- Natural light is to be maximised and artificial lighting is to support natural light levels.
- Protection from intense sun penetration is to be provided.

Britomart Transport Centre, Auckland. Lighting is designed to provide a safe, legible and comfortable environment for customers and users.
Architects: Mario Madayag & Jasmax
Source: Opus

Westfriedhof Station, Munich. Coloured light in station platform
Lighting Designer: Ingo Maurer
Source: Unframed World

3.3 Connectivity

Safe and convenient connections to and from Sydney Metro stations are an important part of an easy customer experience. Connectivity between different transport modes including walking, cycling, rail, light rail, buses, taxis and kiss and ride, must be legible and easy, acknowledging that Sydney Metro is part of an integrated transport system.

A modal hierarchy that prioritises pedestrian connections has been established to guide the Sydney Metro design and ensure the safety and wellbeing of customers and users of the station environs.

The design of the Sydney Metro stations and station precincts must facilitate safe, welcoming intuitive and accessible connections between transport modes. This part provides guidelines for the following:

- Interchange
- Pedestrian Movement
- Bicycle Movement
- Vehicular Interface

Signage supports connectivity between different modes, and provides customer information to assist trip planning.
Source: TfNSW

3.3.1 Interchange

Relevant Design Objectives

1	Ensuring an easy customer experience
2	Being part of a fully integrated transport system

Principle

Provide an efficient, safe transport service that is part of a fully integrated and accessible transport system.

Guidelines

- Station planning and design is to acknowledge Sydney Metro forms part of an integrated transport network that includes a hierarchy of movement modes:
  - Priority 1: Pedestrian, wheelchair and pram movement and access
  - Priority 2: Bicycle movement and access
  - Priority 3: Other primary Public Transport services (including Light Rail and Bus movement and access)
  - Priority 4: Taxi movement and access
  - Priority 5: Kiss and ride movement and access
- Station Precinct planning is to support good access to and between public transport modes for all customers, with connections designed to support efficient and timely interchange for customers.
- Integration of station precincts with the surrounding urban structure is to facilitate cross and through movements, enhancing precinct permeability and access to the transport interchange functions of the locality.
- The stations are to provide a safe, welcoming, intuitive and accessible environment for customers transferring between transport modes.
- Station design is to minimise movement conflicts for customers between key transport modes.
- Station forecourt areas to accommodate adequate customer access and waiting spaces (as relevant), while ensuring that customer confidence, sense of safety and wellbeing are not compromised.
- The varying spatial requirements of different transport modes, including third party operators, are to be accommodated to avoid user conflicts.
- Provide point of decision wayfinding signage to facilitate walking and cycling choices.
- Consider the Sydney City Centre Access Strategy when planning for transport and interchange functions around stations.

Station modal access hierarchy
Source: TfNSW

3.3.2 Pedestrian Movement

Relevant Design Objectives

1	Ensuring an easy customer experience
2	Being part of a fully integrated transport system

Principles

Provide pedestrian connectivity between transport modes that is safe, efficient, accessible, legible and enjoyable.

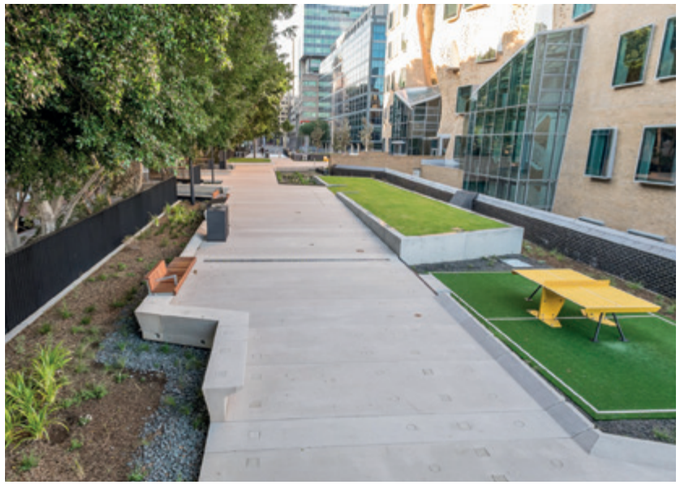
Provide pedestrian movement systems that clearly connect the stations with their surrounding locality.

Ensure the vertical journey is a core element of the station architecture and provides step free access between the street and the platforms as it is integral to the station's design and has a major influence on the function and visual impact of the station environment.

Guidelines

- The station forecourt and associated areas are to adopt a clear hierarchy of movement functions that favour pedestrians ahead of vehicular circulation, thereby promoting opportunities for public transport patronage, walking and cycling.
- Station precincts are to provide pedestrian routes that connect people with places they want to go and provide clear sightlines through open, uncluttered spaces along pedestrian desire lines between key destinations.
- Pedestrian movements are to accommodate an appropriate level of service in all areas of the station. Precinct designs are to optimise the variety of movement functions in order to minimise potential conflicts.
- Circulation systems are to respond to context and reinforce the character of precincts so they are easy and efficient to navigate.
- Design decisions affecting movement planning are to consider varying customer usage patterns including commuters, customers with disabilities, station employees, tourist customers and non-travelling visitors.

Wide, clear footpaths enable people to stop and wait without obstructing pedestrian movement flow.
Source: TfNSW



The Goods Line, Sydney. Design walkable attractive places with high visual amenity. Circulation systems that respond to context and reinforce the character of precincts should be easier to navigate and therefore more efficient.
Architect & Landscape Architect: CHROFI & Aspect Studios
Source: TfNSW

3.3.3 Bicycle Movement

Relevant Design Objectives

2	Being part of a fully integrated transport system

Principle

Prioritise bicycle movement consistent with the modal access hierarchy by providing optimum connectivity and convenient, secure and accessible bicycle parking at stations to accommodate current and future demands.

Guidelines

- Bicycle paths to/from stations are to be connected with regional and local government bicycle networks, existing and future.
- Bicycle infrastructure is to be responsive to the specific characteristics of each station precinct, address the bicycle network and storage requirements, and integrate them into the broader precinct movement networks.
- The design of bicycle paths and routes connecting directly to/from stations is to be legible, with a distinct and identifiable character and be safe for cyclists and other users.
- Access to bicycle networks is to be easy, enabling the comfortable flow of bicycle traffic.
- Conflicts between pedestrians and cyclists at stations are to be designed out, particularly at high activity zones such as station entries and retail areas.
- Provide convenient, safe, secure bicycle storage facilities, with good natural surveillance and weather protection, connected to existing cycle ways.
- Sheltered and secure bicycle parking at stations is to be placed directly adjacent to movement paths to provide clear and legible access, without compromising safe, accessible paths of travel for customers with mobility and vision impairment.
- Design for bicycle facilities is to give priority to bicycle safety at road interfaces.
- Integrate with the directions established in Sydney's Cycling Future.

Attractive, secure, weather protected bicycle storage.
Source: Sydney Cycleways.

Provide for people with bicycles throughout the intermodal connections.
Source: TfNSW. Copyright: Glenn Duffus Photography

3.3.4 Vehicular Interface

Relevant Design Objectives

2	Being part of a fully integrated transport system

Principle

Establish a legible hierarchy of safe vehicular streets that respond to the varying customer and operational requirements for vehicular, bicycle and pedestrian movements in accordance with the modal hierarchy.

Guidelines

- The design of stations and associated urban realm is to respond to the character of established streets and variations in carriageway width, on-street parking, existing and planned future cycle ways, street tree planting and pedestrian amenity.
- Modifications to existing roads are to consider:
  - Agreed adjustment of existing roads with relevant authority
  - Number of traffic lanes
  - Length and type of slip lanes
  - Intersection types and configurations Signalling requirements
  - Speed environments, traffic calming measures
  - Kerbside zones
  - Cycling
  - Footpaths
  - Crossings
- Changes to streets, footpaths and bicycle paths are to contribute to the quality and character of the urban area, and will heavily influence customer experience.
- Vehicular traffic planning is to be integrated with the built form and spatial planning of precincts.
- Consider the Sydney City Centre Access Strategy in planning for vehicular movement around stations.
- Provide for bus stops close to the station in accordance with the modal hierarchy, bus movements where buses operate on streets adjacent to station entries and safe and accessible paths to bus stops.
- Consider the need for secure electric bike/scooter and motorbike parking spaces. Consider locker provision at stations to cater for storage of electric scooters, electric bicycles, and batteries, and charging of personal electric transport.
- Taxi and kiss and ride spaces are to be located in accordance with the modal hierarchy.
- Service vehicle access for all precinct functions is to be addressed as part of the broader station precinct movement strategies.

Note - further guidelines on Service Vehicle Access are set out in Section 4.3.7

Sydney. Dedicated bicycle and bus lanes.
Source: TfNSW

Sydney City. Designated taxi pick up zones.
Source: AECOM.

4

Elements

About this Section

This section provides guidelines for developing the detailed elements of the urban and public domain around and within stations including connecting customer areas through station entries.

The guidelines for the design elements in this part of the document are arranged according to the following three topics:

- Stations
- Urban Realm
- Operational and Services

More detailed design guidelines and key requirements for each of these elements will be included in the scope and performance documents during the procurement stage.

Sculptural plant extraction vents at One Shelley Street, Sydney.
Artist: Anton James
Source: TfNSW

4.1 Stations

The Sydney Metro stations are part of a wider system requiring consistency between station planning, operations and architecture. Each station will take on a unique identity that relates to its locality, expressed through the station design. The interface between the station and surrounding context is critical in providing an integrated and legible transport system that is easy for the customer to use.

The design of each station must be framed around the benefits to or impacts upon the customer experience. Station entries, platforms and circulation elements must be designed to meet operational requirements while ensuring an easy customer experience. Stations are public buildings and all circulation elements, finishes and fittings must be of a robustness and quality associated with outdoor public spaces as well as suitability for the rail environment.

This part provides guidelines for the following station elements:

- Station Typology
- Station Entries
- Platforms
- Circulation Elements
- Flooring
- Internal Walls and Ceilings

Macquarie Park Station. Clear sightlines and uncluttered spaces provide a safe and welcoming customer environment.
Source: TfNSW

4.1.1 Station Typology

Relevant Design Objectives

1	Ensuring an easy customer experience
2	Being part of a fully integrated transport system
5	Delivering an enduring and sustainable legacy for Sydney

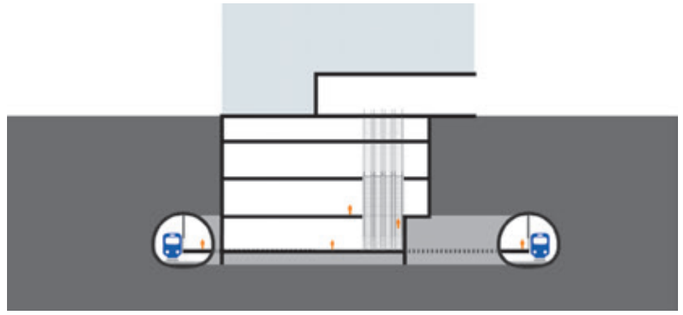
Principle

The designs are to provide consistency between station planning, operations and architecture across the differing station typologies that will be adopted between Chatswood and Sydenham. There will be three principal typologies that relate to their construction type:

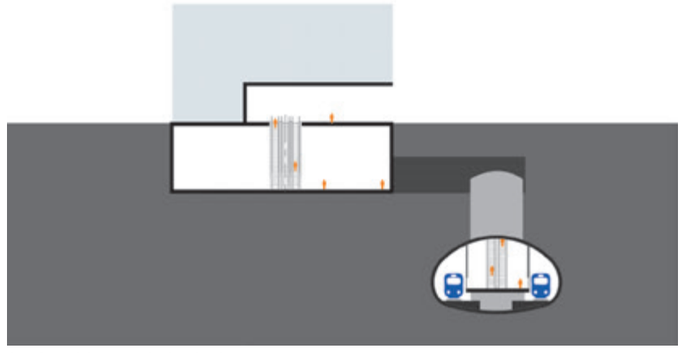
- ***Cut and cover***
- ***Single cavern***
- ***Binocular cavern***

Guidelines

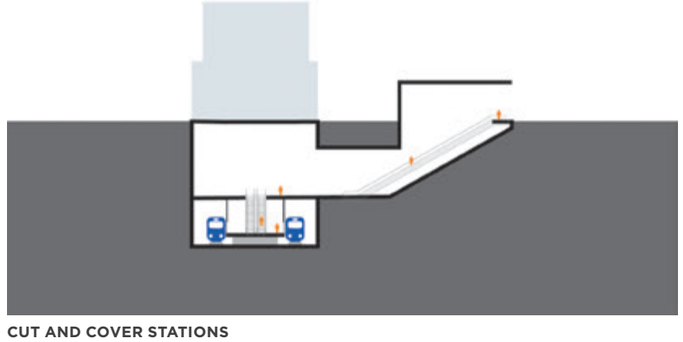
- The stations are to be integrated with the urban design of the adjoining precinct to provide direct and safe accessibility to the station entry.
- The station design is to enable integration with existing and future local development opportunities within adjacent sites as relevant.
- Designs are to provide a legible station entry integrated with public domain.
- Station designs are to provide a seamless transition between transport modes.
- The Sydney Metro stations should maximise consistency in the key functional elements of the architecture.
- Where there is sufficient space and where appropriate, station entries and gatelines are to be located at ground level to provide a line of security at street level.
- Integration of operational and customer facilities is to be consistent across the three typologies providing a high quality and consistent experience for all users.
- Design to minimise level changes between the street and station entries
- Maximise access to natural light and ventilation
- All entries and concourses are to be open and transparent, generous and inviting.
- Design for efficient customer circulation and intuitive wayfinding to and from station entries and platforms.
- Allow for affordable and flexible business premises including pop ups, start-ups, micro and small businesses.
- Consider role of station retail elements in supporting a night time economy, including retail areas, lighting, and use of public spaces by the community.



BINOCULAR CAVERN STATIONS
MARTIN PLACE
PITT STREET



SINGLE CAVERN STATIONS
VICTORIA CROSS



CUT AND COVER STATIONS
CROWS NEST
BARANGAROO
CENTRAL
WATERLOO

4.1.2 Station Entries

Relevant Design Objectives

1	Ensuring an easy customer experience
4	Being responsive to distinct contexts and communities
5	Delivering an enduring and sustainable legacy for Sydney

Principle

Station entries including canopies and concourses are to create a strong and consistent line-wide visual identity to the station environments and be designed as intuitive interchange spaces for customers.

Guidelines

General

- Entrances to stations including canopies and concourses are to provide a consistent line-wide identity for Sydney Metro and are to be clearly visible from the immediate area.
- Canopies and entrances are to respond to the built form and character of the surrounding context in terms of scale, setbacks and character, as well as heritage context where relevant.
- Station entries are to be legible from the street and public domain and are to minimise long blank walls through articulation of the built form.
- Station entries are to provide active street frontages where possible, prioritising pedestrian activity and amenity at ground level.
- Station entries are to incorporate canopies/awnings as appropriate to provide weather protection for customers, community information, amenities, and ticketing equipment, gateline and appropriate queuing zones.
- Entry concourses should be clutter-free with clear and simple directional signage, simple volumes and flush continuous materials with components that support wayfinding.
- Entry spaces are to be well lit, bright and welcoming to enhance customer experience providing a safe, open environment that has good permeability and clear sight lines from inside and outside the station.
- Where possible, natural light areas should be provided over Vertical Transport (VT) and concourse areas to reinforce intuitive wayfinding.
- Adequate space should be provided to meet patronage demand and to provide clear zones for queuing at Ticket Vending Machines (TVMs) and gatelines, including during special events, separate to paths of travel.
- Columns are to be minimised and carefully positioned not to obstruct key sightlines or pedestrian movement, particularly for the mobility or visually impaired.
- Lighting, communication, wayfinding and information and security systems are to be well integrated with equipment and recessed where possible.
- Unobtrusive maintenance access is to be provided.
- The materials palette is to be of high quality and is to integrate with surrounding high quality public realm context.
- Permanent public art should be integrated within the station architecture. Art should act as a visual cue to enhance wayfinding.

Canopies and Awnings

- Canopy or awning features are to consider the adjacent character of buildings and should sit comfortably within their context.
- The entry canopy/awning design is to create a recognisable identity for stations along the Sydney Metro line but may not necessarily be common across all types of stations due to the diversity of the built form.
- Entry canopies should be clearly visible in the locality.
- The entry canopies should promote a sense of arrival and offer a weather protected threshold for customers.
- The entry canopy design should contribute positively to the built environment by enhancing the immediate public domain.
- Weather protection to station entry and concourse should be provided as a single integrated element.
- Roof lights should be integrated within the entry canopy and located directly over the customer's path of travel towards the vertical circulation zone to aid intuitive wayfinding.

Canary Wharf Station, London. Natural light over entries and VT enhances wayfinding and creates a welcoming station environment.
Architect: Foster + Partners
Source: Cox Richardson

4.1.3 Platforms

Relevant Design Objectives

1	Ensuring an easy customer experience

Principle

Platform designs are to maximise efficiency and provide a high level of service and an easy customer experience.

Guidelines

- Platforms are to provide efficient and safe access to the Metro service through good sightlines, generous circulation and open and spacious planning.
- Vertical transport (VT) distribution and position on the platform is to be coordinated with the demand and movement patterns of customers.
- Platforms are to be free of recesses and indentations which could offer hiding places and litter traps, disrupt continuous paths of travel for the visually impaired and hinder CCTV coverage.
- Emergency egress must be provided.
- Platforms should establish a strong relationship with the vertical circulation zone through lighting and material palette selection.
- Platforms should minimise structures and columns to maximise sightlines and customer waiting and circulation space.

Note - design guidelines for platform screen doors are set out in Section 4.1.6.

Canary Wharf Station, London. Example of central columns and fixtures
Architect: Foster + Partners
Source: Cox Richardson

Macquarie Park Station. Example of transparent vertical circulation within an open platform that maximises sight lines.
Architect: Hassell
Source: Cox Richardson

4.1.4 Circulation Elements

Relevant Design Objectives

1	Ensuring an easy customer experience
2	Being part of a fully integrated transport system

Principle

Enable step free access between the street and the platform via lifts and escalators that are integrated with station design.

Guidelines

- All Sydney Metro platforms are to be served by escalators and lifts. Lifts and escalators are to provide direct access from entry concourse to platform level.
- All circulation elements are to provide a means of safe movement of people in and around the stations.
- Stairs are to be avoided in stations as far as possible as they reduce opportunities for universal access. Where the use of stairs cannot be avoided or provide a secondary means of access, they must be easy and safe to use.
- Where ramps, lifts and escalators are provided as an alternative to stair access they must not result in a longer journey than the primary circulation route.
- Escalators are to enable a safe, fast and efficient method for vertical transportation for customers to and from station entrance level and platform levels.
- Where feasible, provide stairs adjacent to escalators to facilitate increased levels of activity and for when escalators are closed for maintenance.
- Lifts are to integrate into each different station design and be strong architectural elements in their own right to promote the inclusion of customers using step free circulation elements.
- All circulation elements are to incorporate high quality materials that contribute to the Sydney Metro identity.

Note - further design guidelines on accessible pathways are set out in Section 4.2.2.

Chatswood Transport Interchange, NSW. Good example of a glazed lift and shaft
Architect: CoxDesignInc.
Source: Cox Richardson

4.1.5 Flooring

Relevant Design Objectives

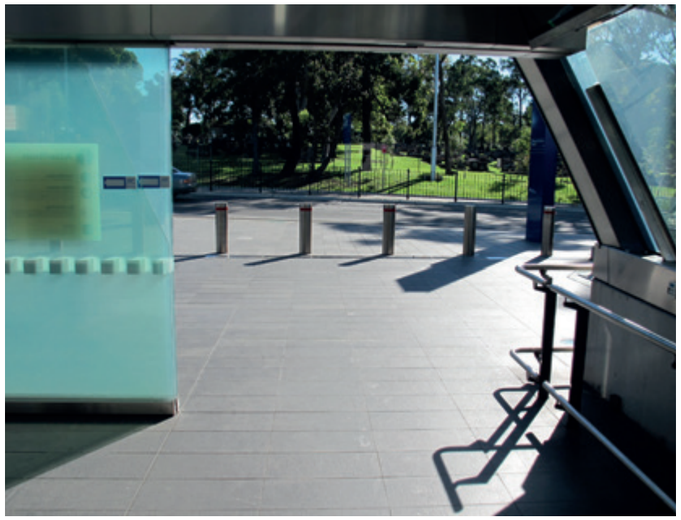
1	Ensuring an easy customer experience
4	Being responsive to distinct contexts and communities
5	Delivering an enduring and sustainable legacy for Sydney

Principle

Ensure the safe, efficient movement of pedestrians, including people with disabilities, through high quality and robust flooring design suitable for the station environment.

Guidelines

- Flooring is to provide a safe and robust solution, suitable for the station environments. Types of flooring include those appropriate to public areas and others to areas of the station where special flooring is required.
- Flooring is to form a part of the Sydney Metro line-wide identity and maximise operational efficiencies.
- Flooring selection is to consider long term wear and tear, maintenance, sustainability objectives including dematerialisation and embodied energy, and future replacement as an important consideration in the design process.
- Flooring is to consider the urban realm context of the station, creating a seamless transition between the external and internal station environs.
- Flooring is to provide a clean, attractive and uniform appearance throughout the stations and is to be integrated with the broader internal materials palette to aid wayfinding.
- Flooring pattern and design is to accentuate movement.



Coordinate interior and exterior public domain pavements.
Source: AECOM.

North Sydney Station, NSW. Example of an open clutter free concourse with directional flooring.
Architect: Cox Richardson
Source: Cox Richardson

4.1.6 Internal Walls and Ceilings

Relevant Design Objectives

1	Ensuring an easy customer experience
4	Being responsive to distinct contexts and communities
5	Delivering an enduring and sustainable legacy for Sydney

Principle

The vision for the design of wall and ceiling elements is the development of a system with inherent flexibility to adapt to the characteristics of individual stations while contributing to the Sydney Metro line-wide identity.

Guidelines

General

- The appearance and function of the walls is to be suitable for a rail environment and reinforce the Sydney Metro identity.
- Wall systems and details are to respond to their location, function and acoustic environment.
- Ease of access, maintenance and replacement of walls sections is to be considered.
- Robust cladding materials and finishes are to be selected in response to the local environment and conditions.
- Feature walls are to be an identifiable station element used in vertical circulation zones to accentuate the customer pathways and establish a strong architectural language.
- Walls and ceilings over tracks are to be calm and simple and contribute to the high quality station environment and customer experience.
- The materials palette should balance a calm and neutral quality with vibrant materials to aid wayfinding and accentuate movement.
- Use of colour/texture should assist in legibility and wayfinding.
- Wall and ceiling detailing should take into consideration the integration of station assets such as signage, fixtures and machines.

Platform Screen Doors

- Platform Screen Doors (PSDs) are to be minimal and elegant, seamlessly integrating customer information and supporting the station servicing requirements.
- Stations are to integrate the following PSD design considerations:
  - Be full height
  - Run full platform length
  - Integration of the end walls is to be well-considered.
  - Extent of glazing for customer experience is to be well-considered.
  - Security requirements
  - Modularity of units - constructability, repair and replacement.
  - Interface with other wall, floor and ceiling junctions

Copenhagen Metro, Denmark. Good example of full height PSD
Architect: KHRAS Architects
Source: Cox Richardson

4.2 Urban Realm

The public domain is a significant component of the door-to-door journey for Sydney Metro customers. The design quality of station precincts, forecourts and streetscapes outside station entries will therefore be of paramount importance to the overall public experience and perception of the new system. This has implications for the detailed design stages of the project with a range of architectural and engineering structures, landscaping elements and operational equipment that will need to be coordinated to ensure that coherent and distinctive station environs are delivered.

Each station will take on a unique identity that responds to its locality, expressed through the station design in both precinct urban realm and buildings. The interface between the station and surrounding streetscape needs to be well integrated and functional as part of the provision of robust and legible interchange precincts around Sydney Metro stations.

Key elements of the public realm around Metro stations and the alignment that are considered in this part of the document include:

- Landscaping
- Accessible pathways
- Furniture
- Walls and Fences
- Earthworks and Engineered Structures

The Goods Line, Sydney.
Architect & Landscape Architect: CHROFI & Aspect Studios
Source: TfNSW

4.2.1 Landscaping

Relevant Design Objectives

1	Ensuring an easy customer experience
4	Being responsive to distinct contexts and communities
5	Delivering an enduring and sustainable legacy for Sydney

Principle

Provide hard and soft landscapes that establish a civic quality to the Sydney Metro project and an attractive customer public realm at stations located within the central city. Reflect the existing urban character along the corridor that is appropriate to local conditions.

Guidelines

General

- The landscape design is an important component of a positive, high quality and appealing urban realm identity for Metro stations and structures.
- Hard and soft landscaping design, species selection and material palettes are to relate and reflect the existing urban fabric of the city.
- Landscape treatments are to be appropriate to a functional station and related transport operations and address safety-in-design issues relevant to a transport customer environment and adjacent road and public realm networks.
- Landscape treatments are to be designed to provide appropriate scale and comfort to users throughout the seasons, with planting and materials palettes suited to the local microclimate and any surrounding development considerations.
- Integrate water sensitive urban design including permeable pavement.
- Consider reuse of materials from demolition e.g. in public space landscaping.
- Materials are to minimise slips, trips and falls.

Hard Landscaping

- The external materials palette is to be durable and establish a strong Sydney Metro identity, consistent with a CBD and inner-urban station environment.
- Materials and finishes are to be high quality, robust, durable and meet all functional requirements such as customer interface, component and services integration.
- A hierarchy of paving types should be provided that are appropriate to function and location.
- Use of colour/texture is to assist in legibility and wayfinding, within the context of the immediate station public realm.
- To optimise the legibility of precinct spaces, paving should consist of simple, linear patterns that relate to the main direction of travel.
- The paving palette is to be developed with reference to relevant local council public domain requirements and materials guidelines.
- Materials are to maximise economies of scale and be designed to ensure safe installation, low maintenance and long term durability to minimise the need for replacement.
- Paving is to be the same on each side of the station gateline and be of the highest quality consistent with the Sydney Metro image.
- As well as satisfying the relevant standards and design codes for visual and tactile contrast, products should be selected in order to complement the design of associated pavement materials.

Soft Planting

- Plant species are to be appropriate to local conditions and relate to the character of the urban context - both current and/or planned future context.
- The general planting arrangements and species are to suit the spatial scale of each public domain setting, without compromising pedestrian capacity and circulation outside stations.
- Where appropriate street trees are to provide strong, legible structure planting where appropriate at stations, either to reinforce spatial movement, connectivity with adjacent areas, civic quality, visual continuity or identity and character.
- Depending on orientation and urban enclosure, selected tree species are to provide shade during summer months and good solar access in winter months. Proposed species are to respond to existing council policies and guidelines and character drivers.
- Proposed plants are to be low maintenance and based on minimal water requirements beyond the establishment phase.
- Trees, shrubs and groundcover are to help reduce potential heat island effects and to provide valuable amenity for customers and the broader urban community.
- Screen planting is to be employed to help mitigate the visual impact of retaining structures, noise walls and service facilities as required.
- All planting must maintain clear setbacks and sight lines at road intersections and be offset from other transport infrastructure elements at suitable distances for the selected species.

4.2.2 Accessible Pathways

Relevant Design Objectives

1	Ensuring an easy customer experience
2	Being part of a fully integrated transport system

Principle

Provide pathways to and from station entries and facilities that are accessible, safe and comfortable for all users.

Guidelines

- A system of appropriate pathway surfaces, widths and gradients is to provide safe and equitable pedestrian access throughout the public domain and to link transport modes.
- Station precincts must be easy and safe for all to use regardless of physical mobility; able bodied customers, wheelchair users, carers with strollers, the visually and cognitively impaired should all be provided with equal access.
- Stairs are to be avoided as far as possible as they reduce opportunities for universal access. Where the use of stairs cannot be avoided, then they must be short in length, easy and safe to use.
- Where the use of stairs is unavoidable, clearly legible alternative circulation routes should be provided. These alternatives should be as close as possible and not isolated from the primary circulation route.
- Ramps may provide opportunities for universal access; however, where possible, seek alternative means of effecting level changes, for example, by altering the path of travel.
- All alternative means of effecting level changes should be considered, for example by altering the path of travel.
- Selective use of colour, texture, lighting, finishes and customer information to further define paths of travel, circulation spaces and the location of key facilities.
- Tactile Ground Surface Indicators (TGSIs) should be used on paths of travel to warn customers with vision impairment of hazards and assist wayfinding where required.
- Where possible, provide a consistent, clear path of travel for customers with vision and mobility impairments by keeping one side of paths of travel clear of fittings and fixtures.

Design paths and ramps for access for all. All modal connections must be located in convenient, safe, well-lit areas with good natural surveillance.
Source: AECOM.

Martin Place, Sydney. Carefully locate all street furniture to minimise potential obstructions and maximise use of circulation spaces.
Source: AECOM.

4.2.3 Furniture

Relevant Design Objectives

1	Ensuring an easy customer experience
2	Being part of a fully integrated transport system

Principle

Furniture and fixtures are to provide respite, safety, comfort, services and functionality to public spaces, as well as punctuating the station domain with items of interest.

Guidelines

General

- Furniture and fixings are to be robust, high quality and attractive, respond appropriately to context and be representative of the Sydney Metro identity.
- In addition to their functional and amenity value, furniture and fixings are to be used to delineate function zones and restrict or manage pedestrian access.
- Elements in common locations (bins/seating/drinking fountains/bollards) are to adopt a rational layout in order to minimise visual clutter within the public domain and maximise safe and accessible paths of travel.
- All components should be accessible and fully integrated with the station design.
- Modularity of components should retain ability for future enhancement or replacement.
- Robust materials should ensure durability within a rail environment.
- Street furniture should be selected with consideration to facilitating active uses and informal recreation.

Seating

- Seating placement should not impede customer flows and be located to provide resting points for the customer journey.
- Provide seating integrated with structures and landscape elements where it does not impede customer flows.
- Seating is to be located along main paths of travel adjacent to entrances, transit shelters, major crossover areas and no more than 60m apart.
- The location and grouping of seating and other elements is also an opportunity to help create meeting places and a sense of place.

Handrails and Balustrades

- Handrails and balustrades should guide safe customer movement and be consistent in material and quality line wide.

Waste Bins

- Bins should be consistent line-wide, including consideration of the locality and considerations below.
- The station design and management should ensure that, through the placement and maintenance of bins, cleanliness is maintained during operating hours.
- Bins are to be located to minimise the recurrence of litter, whilst considering the ambience and attractiveness of the station precinct.
- Facilitate waste separation and recycling.

Barangaroo, Sydney. The furniture and fixing colour palette should be coordinated with architectural elements, surface finishes and pavements.
Architect: Tzannes Associates
Source: TfNSW

Chatswood Station, Sydney, NSW. Example of handrail and stanchion
Architect: CoxDesignInc.
Source: Cox Richardson

4.2.4 Walls and Fences

Relevant Design Objectives

1	Ensuring an easy customer experience
4	Being responsive to distinct contexts and communities
5	Delivering an enduring and sustainable legacy for Sydney

Principle

The vision for the design of wall and fencing elements is the development of a system which can be applied across the corridor and station sites with a high quality, robust and durable form that is representative of the Sydney Metro image and each station's context.

Guidelines

- The appearance and function of external walls and fencing is to be suitable for a rail environment and reinforce the Sydney Metro identity.
- Location, scale and articulation of external walls and fences are important elements of the public realm. Their design is to be an integral part of the urban design of station areas and corridor sites to minimise excessively long unarticulated lengths, inactive, bland and unappealing frontages.
- Wall and fencing systems and details are to respond to their location, function and acoustic environment.
- Ease of access, maintenance and replacement of walls and fencing sections is to be considered.
- Robust cladding materials and finishes are to be selected in response to the local environment and conditions, and sustainability objectives including dematerialisation and embodied energy.
- Feature walls are to be used to accentuate customer pathways and establish a strong architectural language at stations, employing artworks at appropriate sites.
- The materials palette should balance a calm and neutral quality with vibrant materials to aid wayfinding and accentuate movement.
- Use of colour/texture should assist in legibility and wayfinding.

Terracotta louvred facade provides a vibrant wall surface.
Source: AECOM.

Glazed facades enable transparency and legibility.
Architect: The Buchan Group
Source: Apple

4.2.5 Earthworks and Engineered Structures

Relevant Design Objectives

1	Ensuring an easy customer experience
4	Being responsive to distinct contexts and communities

Principle

Ensure earthworks and engineered structures such as noise walls, retaining walls and portals are visually integrated into their urban or landscape setting as much as possible, keeping engineered structures to a minimum.

Guidelines

Earthworks

- Dive structures at Marrickville and Chatswood may require cut embankments as a combination of engineered slopes and low retaining walls, to create an integrated, 'sculpted' landform, suited to the rail corridor setting.
- All earthworks are to sit lightly in their context, exhibiting a 'natural fit' within their landscape setting wherever possible.

Retaining Walls and Portals

- Retaining walls and related elements are to be designed as a unified composition and be integrated with the adjoining landscape (as appropriate) and other components such as fencing, guard rails, steps and other walls.
- The precautionary principle is to be adopted throughout so that retaining walls are only constructed where there is no other alternative.

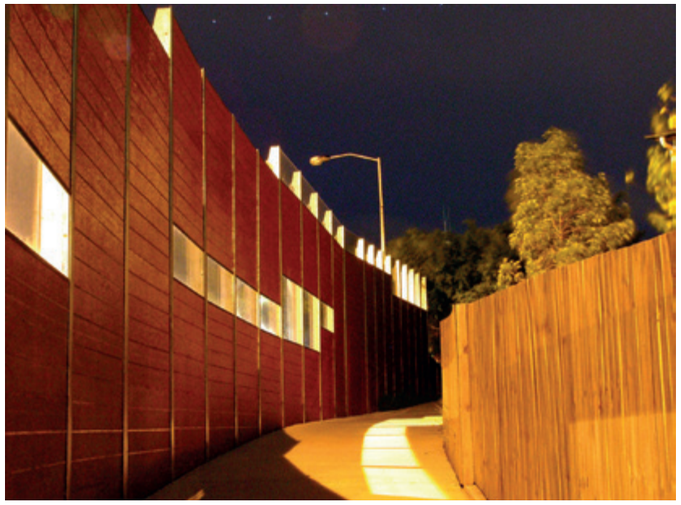
Noise Walls

- Noise walls and retaining walls (where required) are to form a coordinated design system.
- Noise wall panels are to be comprised of robust, vandal-resistant materials and be resilient to damage by adjacent planting. Material and system selection to consider sustainability objectives including dematerialisation and embodied energy.
- Any noise walls are to be designed as part of a hierarchy of walls that includes retaining walls, abutments and parapet walls, such that each element appears to be visually coordinated.
- The apparent scale and visual impact of noise walls is to be reduced with careful planting, even when space is limited.

Bridges

- Design in accordance with the Bridge Aesthetics Design Guideline prepared by Roads and Maritime Services.

Gore Hill Freeway, Sydney. Provide retaining walls that are topped out by a consistent concrete capping beam.
Source: AECOM.



When designing noise walls consider their visual impacts from both inside and outside of the rail corridor.
Source: AECOM.

4.3 Operation and Services

The design of project infrastructure must be tailored to meet operational requirements and the transport function and integrity of the Metro system over the longer term. Design should also respond to the management and maintenance obligations that will be a critical part of the success of the Metro over successive generations as the greater Sydney region grows and demands on the transit services increase.

Stations, buildings, external areas and related corridor structures must be suitable for a high capacity passenger rail environment traversing a dense urban setting and a complexity of interfaces. The stations needs to have a consistent, reliable and bespoke series of facilities that assist both staff, servicing and security operations and meet the needs of the customers who will utilise the system on a daily or more infrequent basis.

This part of the guidelines relates to the following elements:

- Wayfinding and Signage
- Ticketing equipment and Fixtures
- Engineering and Services Integration
- Management and Maintenance
- Security
- Emergency Requirements
- Service Vehicle Access

Grand Concourse, Central Station. Transport Information with Passenger Information Display.
Source: TfNSW

4.3.1 Wayfinding and Signage

Relevant Design Objectives

1	Ensuring an easy customer experience
2	Being part of a fully integrated transport system
4	Being responsive to distinct contexts and communities

Principle

Provide intuitive, clear and consistent information and signage to enhance customer journeys through efficient navigation and interchange, creating a seamless and intuitive customer journey from origin to final destination.

Guidelines

- All customer wayfinding and information signage must enable customers to navigate each station and precinct as part of a cohesive door-to-door journey.
- Information is to include, but not be limited to, information in trip planning; finding the right platform; making connections to another form of transport; destinations in the local precinct; 'real time' information for all public transport modes; wayfinding; facilities and amenities.
- A modern public address system is provided that is capable of projecting clear and audible information throughout the station.
- Advertising should not compromise wayfinding. The design and placement of customer information is prioritised as follows:
  - Wayfinding and customer information
  - Customer campaigns
  - Advertising

Circular Quay, Sydney. Signage and wayfinding enables clear sightlines of the interchange precinct.
Source: TfNSW

4.3.2 Ticketing Equipment

Relevant Design Objectives

1	Ensuring an easy customer experience
2	Being part of a fully integrated transport system

Principle

Provide ticketing equipment and fixtures that are integrated standard products across the Sydney Metro and Sydney Trains network and that contribute to quality and efficient service for customers.

Guidelines

General

- Common ticketing equipment and fixtures include:
  - Ticket Gates
  - Ticket Vending Machines (TVMs) and Opal Top-up Machines
- Equipment and fixtures are to be high quality, consistent throughout the Sydney Metro network and fully integrated with the station design.
- All components are to be robust and durable, suitable for the rail environment.
- Equipment and fixtures are to be located where they are visible and accessible to customers and station staff for wayfinding, security and maintenance
- Materials and installation must enable ease of access for maintenance and future repairs or replacement

Ticket Gates

- Ticket gates should be standard products used line-wide that contribute to quality and efficient service for customers.
- Opal ticket gates are to be used. Provision should be made for accessible gates and glazed manual wide aisle gates to allow for large equipment and prams.
- The number of ticket gates provided is to be sufficient for peak periods
- Ticket gates are to be located to enable sufficient space for comfortable and safe queuing without interfering with circulation routes.
- Wide aisle gates are to be clearly visible and located on accessible paths of travel.

Ticket Vending and Opal Top-up Machines

- TVMs and Opal Top-up Machines are to be clustered together to provide a legible ticket sales zone within the station entrance, and designed to integrate with interior components, materials and information systems.
- TVMs and Opal Top-up Machines must be publicly accessible and close to the station entrance without interfering with circulation routes.
- TVM and Opal Top-up Machine arrangement are to provide adequate space for queuing and manoeuvring by customers using mobility aids.
- TVMs and Opal Top-up Machines should be proprietary standard items and be DDA compliant.

Sydney Trains Opal Only Gates
Source: TfNSW

4.3.3 Engineering and Services Integration

Relevant Design Objectives

1	Ensuring an easy customer experience
2	Being part of a fully integrated transport system
4	Being responsive to distinct contexts and communities

Principle

The rail engineering and service elements for the stations and service facilities should be integrated into the design holistically, whilst being able to be easily maintained.

Guidelines

General

- The station structures and engineering elements are to be designed holistically, fusing architecture and engineering as one cohesive and compelling product.
- The station and station surrounds are to integrate all structural, civil, mechanical, electrical and rail systems to ensure efficient designs.
- Design integrity must be addressed through careful positioning of equipment.
- Minimise the visual impact of engineering components in public areas by concealing all services.
- Station and services design must allow for personnel access and regular maintenance of all engineering elements.
- Dedicated services zones should be integrated into the station designs allowing sufficient space proofing for future requirements.
- Expression of primary structural elements is to be considered.

Service Buildings

- Services buildings and facilities should form an integrated solution with the station architecture and precinct taking into account the scale, context and purpose of the structure.
- Similar materials and components as used in the station should be selected where appropriate to support the Sydney Metro identity.
- Opportunities to provide for active uses and frontages should take priority over service related structures.
- Elements in major urban settings need to consider impacts including visual, environmental and acoustic on the streetscape.
- Elements located in public areas of the station and surrounds are to be integrated with other functions such as public facilities, ticketing and information, fire stairs, community facilities or retail to minimise the impact of the services on the station precinct.
- Access for maintenance and replacement of plant and equipment should be considered including personnel access for regular maintenance tasks. Designs should allow for safe access and egress to all areas of services buildings.

King's Cross Square, London. Good example of a well designed vent structure integrated with other functions within an urban setting
Architect: Stanton Williams
Source: Getty

Macquarie Park Station. Services are concealed and integrated within the cavern structure, enabling the clean expression of the cavern form.
Architect: Hassell
Source: Cox Richardson

4.3.4 Management and Maintenance

Relevant Design Objectives

2	Being part of a fully integrated transport system

Principle

Ensure the selection of cost effective, adaptable materials and assets that are durable and easily maintained and fit-for purpose for high traffic rail environments and customer interface.

Guidelines

- Adopt a consistent and coordinated palette of materials, furniture and fixtures within stations and their precincts to promote cost effectiveness and assist in the development of an efficient management and maintenance plan for Sydney Metro.
- Proposed hard and soft landscaping elements within the external urban realm of stations are to comply with the standards of each local council area to facilitate consistent future management and maintenance regimes.
- Public domain elements external to stations, such as pavement materials, wall types, furniture and fixtures are to be consistent with the existing urban context for ease of maintenance.
- Hard landscaped surfaces and structures in some locations may have to be more durable to withstand the larger loads of and vibrations from specialist installation or maintenance vehicles, notwithstanding vibrations from above or below ground trains.
- All signage, street furniture and operational equipment (e.g. Passenger Information Displays (PIDs) and CCTVs systems) in the public domain are to be designed to minimise vandalism and simplify cleaning.
- Placement and detailing of furniture, fixtures and equipment should consider impacts by birds, insects and mammals on operational assets and the customer environment.
- All assets, including paving, lighting, signage and street furniture, are to be of a standardised modular design as far as practical that is readily available and have readily replaceable components.
- Materials, furniture, fittings and fixtures are to be selected and sized in a manner that allows easy installation and repair. All components should meet the required life cycle objectives of Sydney Metro and consider sustainability objectives including dematerialisation and embodied energy.
- Materials and finishes will be able to be easily cleaned and maintained with consideration for graffiti resistance in customer interface areas.
- Furniture, fixtures and fittings are to be robust and durable, with consideration of detailing and placement to resist vandalism.
- The design for each station is to accommodate future maintenance access to all elements, including components that may require the use of heavy or large machinery or structures to be erected for installation of structures and equipment, regular cleaning or repair.
- Stations and station precincts should be designed to facilitate access in a safe environment for operational staff and customers alike. Maintenance considerations are to be integral to the design process from an early stage.

Temporary or ancillary equipment, vending machines or any other structures (i.e. temporary signage) are not be placed in the primary pedestrian paths.
Source: Grimshaw.

4.3.5 Security

Relevant Design Objectives

2	Being part of a fully integrated transport system

Principle

Ensure adequate security for the rail corridor infrastructure, station assets and their users. Visually integrate security elements such fencing, security screens CCTV and lighting into the rail corridor, precinct or station design as part of a coordinated whole-of-corridor design.

Guidelines

- Risks to the rail corridor and stations must be regularly assessed during the design phase to ensure adequate control measures can be put in place.
- A public address system is to be provided at emergency egress and risk points, controllable from Station Control Rooms and Operational Control Rooms.
- CCTV must be provided throughout the station.
- CCTV must be provided at all egress points and risk-sensitive areas.
- Security bollards may be provided where necessary but must not impede safe pedestrian movement. Where required, security bollards should adopt a rational layout in order to minimise visual clutter and maximise safe and accessible paths of travel.

Fencing and Gates

- Security fencing must be provided along the sections of the rail corridor not in tunnel and include permanent gated access at controlled locations. Fencing and gate locations are to be coordinated with strategic emergency access and egress points.
- The selection and detailing of fencing should be fully coordinated throughout the corridor and consist of modular components.
- Corridor fencing must not only respond to security considerations, but also respond to corridor context, including, for example, the provision for high quality fencing at station precincts.
- Security fencing types must be consistent throughout Sydney Metro and respond to the contextual environmental of the rail corridor, including provision for high quality fencing at station precincts where users experience the fencing close at hand and high security, more robust and utilitarian fencing at rail infrastructure/ facility locations.
- Fencing types must be robust, suitable to the rail environment and consider maintenance and future replacement.
- Fencing throughout the station precincts and public domain areas must avoid creating dead ends or sightline conflicts.

Lighting

- Lighting is to consider:
  - Natural daylight.
  - Emergency and exit lighting.
  - Interfaces with wall cladding, soffit systems and other visible services.
  - Consistency in design across all stations and precincts.
  - Ongoing access and maintenance - minimising the number of luminaire and lamp types and considering replacement processes.
  - Sustainability targets and energy usage.
  - Lighting levels sufficient for adequate operation of CCTV.

Homebush, Sydney. Rail corridor security fences should be robust, easily maintained, modular systems that are readily integrated with other urban design elements such as retaining walls.
Source: AECOM.

4.3.6 Emergency Requirements

Relevant Design Objectives

2	Being part of a fully integrated transport system

Principle

Ensure that station precincts, facilities and rail corridors are provided with clearly identified zones for emergency access and egress, eliminating the potential for movement conflicts during emergencies.

Guidelines

- The precincts and rail corridor should provide access for emergency service vehicles and appropriate measures to safeguard all users.
- All station precincts and public domain areas must comply with statutory requirements and emergency procedures and relevant guidelines for fire and safety.
- Emergency requirements are to consider;
  - Effective and clearly signposted station emergency evacuation routes and assembly areas.
  - Adequate zoning and space at emergency assembly points to ensure they are free of clutter and remain accessible at all times.
  - Fire safe refuge areas with CCTV and accessible communication system in underground stations for people who are unable to self-evacuate.
  - Full integration within the relevant station and facilities evacuation plan.
  - Emergency lighting to the immediate station curtilage.
  - The appropriate location of firefighting equipment such as hydrants; all clearly identified and readily accessible.
  - The provision of emergency/security electronic help points.

Hydrant Enclosures

- Hydrant enclosures should be easily identifiable, easily accessed modular components integrated into station cladding systems.
- Hydrant enclosures should be integrated with the surrounding wall system to minimise their visual impact.

All station precincts must accommodate station evacuation and emergency procedures.
Source: AECOM.

4.3.7 Service Vehicle Access

Relevant Design Objectives

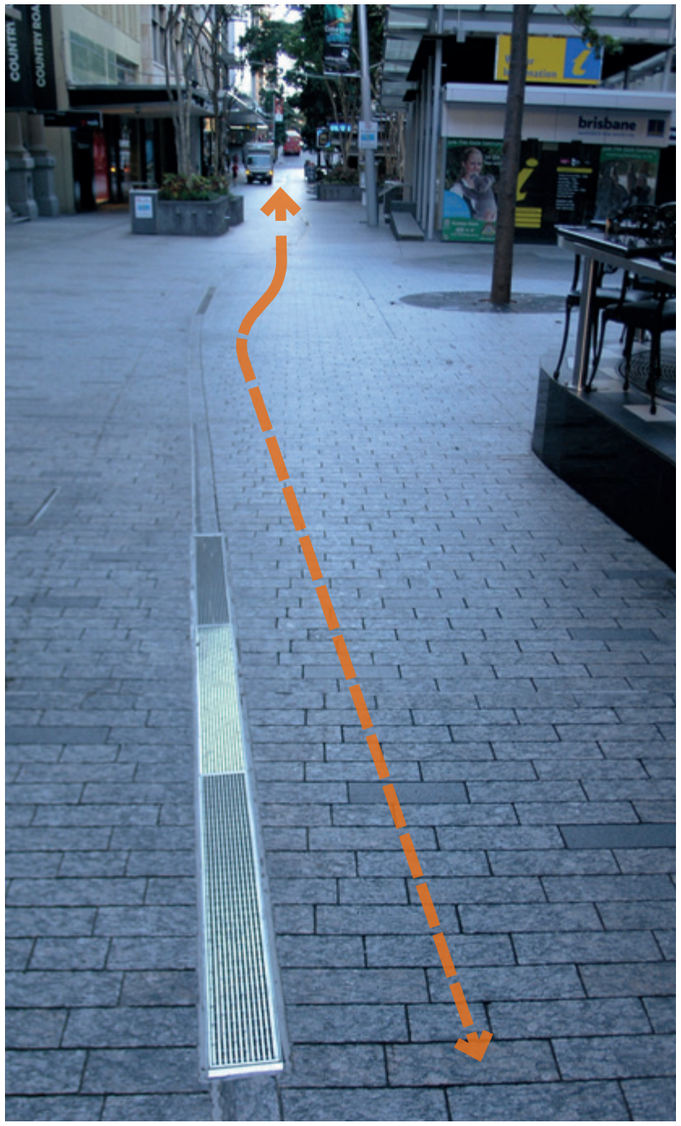
2	Being part of a fully integrated transport system
4	Being responsive to distinct contexts and communities

Principle

Ensure well defined and efficient coordination of service vehicle movements within precincts.

Guidelines

- The station design is to enable access for service vehicles. Service vehicle access is not to compromise the public domain areas of the station forecourt or interchange and connectivity functions.
- Service vehicle access for all precinct functions must be addressed as part of the broader station precinct movement strategies. These strategies must address both the project works requirements and increased movements over the life of the station precincts.
- The operational function and frequency of service vehicles should be considered to determine dedicated zones for daily or frequent access, or shared zones for occasional access within station precincts. Multi-use conflicts in shared zones should be eliminated.



Queen St Mall, Brisbane. Emergency vehicle and service vehicle access through the mall has been provided.
Source: AECOM.

4.4 Specific Elements

There are specific elements along the Sydney Metro corridor that are not adequately addressed in the general design guidelines due to their specialised or sensitive nature. To ensure they meet high quality design outcomes, these elements require additional unique design guidelines which are identified in this section.

A brief description of the context for specific elements is provided, followed by a series of specific guidelines for that element.

Specific elements in the Chatswood to Sydenham project considered in this part of the document include:

- Sydney Yard Access Bridge

Central Station Clock Tower
Source: TfNSW

4.4.1 Sydney Yard Access Bridge

Context

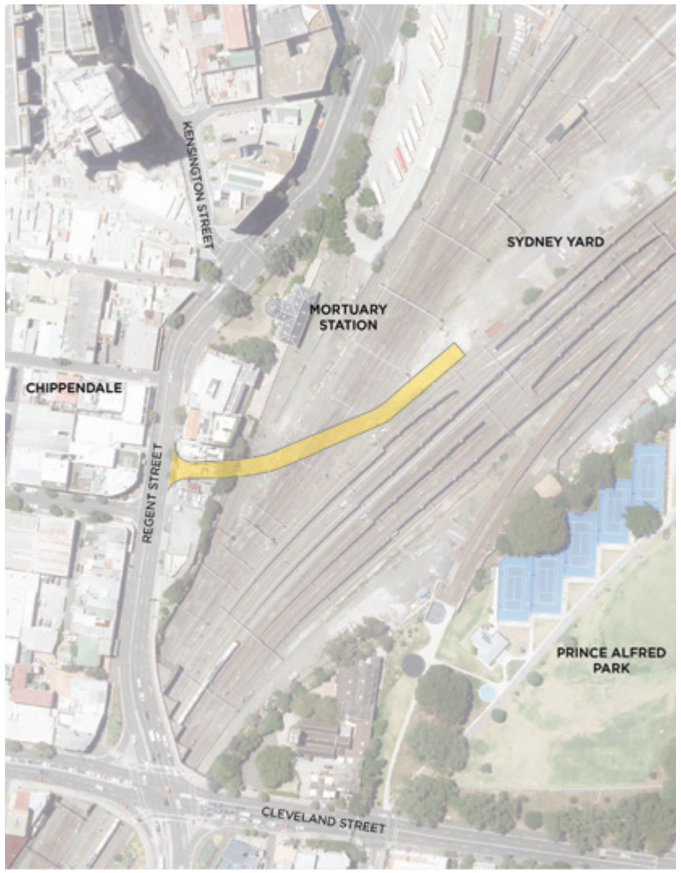
The proposed bridge is located off Regent Street, Chippendale, south of Central Station, north of Cleveland Street and to the east of the Mortuary Station, in the southern sector of the Sydney Yard. The bridge will provide vehicular access to the Sydney Yard during the construction of the Sydney Metro station box and as a permanent access solution to Sydney Yard following the removal of the existing vehicular access from Eddy Avenue.

Principle

The bridge will be of a high architectural and urban design quality, utilising structures, forms and materials that respond to and respect the industrial rail context and aesthetic of the Sydney Yard and setting of Mortuary Station.

Guidelines

- The design shall be visually unobtrusive and minimise adverse impacts on existing views of significant heritage and provide wide and clear spans over the tracks.
- The bridge shall minimise impacts on the heritage values of Sydney Terminal and Central Railway Stations Group, the Chippendale Heritage Conservation Area (HCA), the Mortuary Station or the former Co-Masonic Temple.
- The bridge shall demonstrate best practice in integrated bridge engineering, architectural and urban design and construction.
- The bridge shall have a predominantly continuous compound curvature, with no sharp transitions or deviations, to create a simple elegant form with a gentle sinuous curvature in plan and elevation.
- The bridge shall have a low profile form with shallow deck and low super-structure; with low profile parapet, edge beams, and traffic barriers.
- The bridge approach to Regent Street shall be designed to integrate with the surrounding context and minimise the visual intrusion onto the streetscape.
- The entry driveway and access site off Regent Street is to ensure pedestrian safety and good sightlines across the vehicular driveway; allowing for a pedestrian pavement that continues across the driveway without a kerb or step.
- Landscape screening of dense hedge planting and/or climbing plants shall be provided to adjacent buildings and vertical surfaces to deter graffiti.
- Low maintenance native landscaping together with medium-sized native trees shall be provided to the residual spaces between the approach ramp and the site boundaries to soften the appearance of the site from Regent Street.
- The abutments shall be sympathetic to the existing surrounding viaducts, with bridge piers incorporated within the envelope of the bridge, and shall be of concrete construction with precast concrete panels.
- All screens, balustrades and fences shall be light weight and transparent, and be visually consistent in their aesthetic appearance.
- The bridge shall have no signage or advertising.
- Lighting of the bridge shall be inconspicuous and avoid spill lighting into the adjacent public domain or Mortuary Station and must also not distract train drivers.



Sydney Yard Access Bridge - indicative location plan

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