

# Appendix D

## Design Guidelines

A decorative background consisting of numerous semi-transparent blue and green dots of varying sizes, arranged in a diagonal pattern from the bottom-left to the top-right of the page.

# **Sydney Metro - Western Sydney Airport**

## **Design Guidelines**



# Contents

## 1 Introduction

- 1.1 Purpose of these Guidelines
- 1.2 Project Scope
- 1.3 Project Vision
- 1.4 Sydney Metro Design Objectives
- 1.5 Sydney Metro - Western Sydney Airport Project Urban Design Principles
- 1.6 Towards Aboriginal Cultural Design Principles for Sydney Metro - Western Sydney Airport
- 1.7 Customers
- 1.8 Transport Integration
- 1.9 A Commitment to Safety
- 1.10 A Commitment to Sustainability
- 1.11 Structure of the Guidelines
- 1.11 Application of the Guidelines

## 2 Stations

About this Section

Corridor Context

- 2.1 St Marys
- 2.2 Orchard Hills
- 2.3 Luddenham Road
- 2.4 Airport Business Park and Airport Terminal
- 2.5 Aerotropolis Core

## 3 Function & Experience

About this Section

- 3.1 An Easy Customer Experience
  - 3.1.1 Door-to-Door Journey
  - 3.1.2 Customer Circulation
  - 3.1.3 Way-finding and Legibility
  - 3.1.4 Comfort and Amenity
  - 3.1.5 Customer Safety
  - 3.1.6 Accessibility
- 3.2 Place Making and Identity
  - 3.2.1 Network and Station Legibility
  - 3.2.2 Place-making
  - 3.2.3 Culture and Character
  - 3.2.4 Heritage and Archaeology

- 3.2.5 Environment and Sustainability
- 3.2.6 Art
- 3.2.7 Lighting
- 3.2.8 Integrated and Precinct Development

### 3.3 Connectivity

- 3.3.1 Interchange
- 3.3.2 Pedestrian Movement
- 3.3.3 Bicycle Movement
- 3.3.4 Vehicular Interface

## 4 Elements

About this Section

### 4.1 Stations

- 4.1.1 Stations - General
- 4.1.2 Station Entries
- 4.1.3 Platforms
- 4.1.4 Vertical Transport
- 4.1.5 Flooring and Pavement
- 4.1.6 Walls, Ceilings and Platform Screen Doors

### 4.2 Urban Realm

- 4.2.1 Landscape Design
- 4.2.2 Civic Interface
- 4.2.3 Plazas
- 4.2.4 Access Streets
- 4.2.5 Accessible pathways
- 4.2.6 Furniture and Fixtures
- 4.2.7 Fencing
- 4.2.8 Earthworks and Engineered Structures
- 4.2.9 Bridges and Viaducts
- 4.2.10 Shared User, Cycle and Pedestrian Paths

### 4.3 Operation and Services

- 4.3.1 Way-finding and Signage
- 4.3.2 Ticketing Equipment
- 4.3.3 Engineering and Services Integration
- 4.3.4 Management and Maintenance
- 4.3.5 Security
- 4.3.6 Emergency Requirements
- 4.3.7 Service Vehicle Access
- 4.3.8 Commuter Car Parking

### 4.4 Stabling and Maintenance and Ancillary Facilities

### 4.5 Service Facilities and Tunnel Portals





The background is a solid teal color. A decorative element consisting of numerous light blue circles of varying sizes is arranged in a diagonal line from the bottom-left corner towards the top-right corner.

Part 1

# Introduction

## 1.1 Purpose of these Guidelines

The Guidelines establish the design standards for the Sydney Metro - Western Sydney Airport project (the project) by guiding the design of:

- The interface between stations and their surrounding locality, including:
  - Station entries
  - Transport interchange facilities (bicycle facilities, bus stops, kiss and ride, taxi ranks and connections to existing rail)
  - Landscaping and other public domain.
- Rail corridor works including tunnel, viaduct structures, viaducts, bridges, rail cuttings and embankments.
- Station and service buildings, including underground stations

Any development above, adjacent to or around Metro stations would be subject to a separate planning approval process and is not addressed in these guidelines.

The Guidelines have considered the strategic directions and/or urban design strategies of local and State government agencies, including *Better Placed - an integrated design policy for the built environment of New South Wales*. The Guidelines will be used by Transport for NSW (Transport for NSW) to guide the design development process for the project.



Concept for Central Station, Sydney

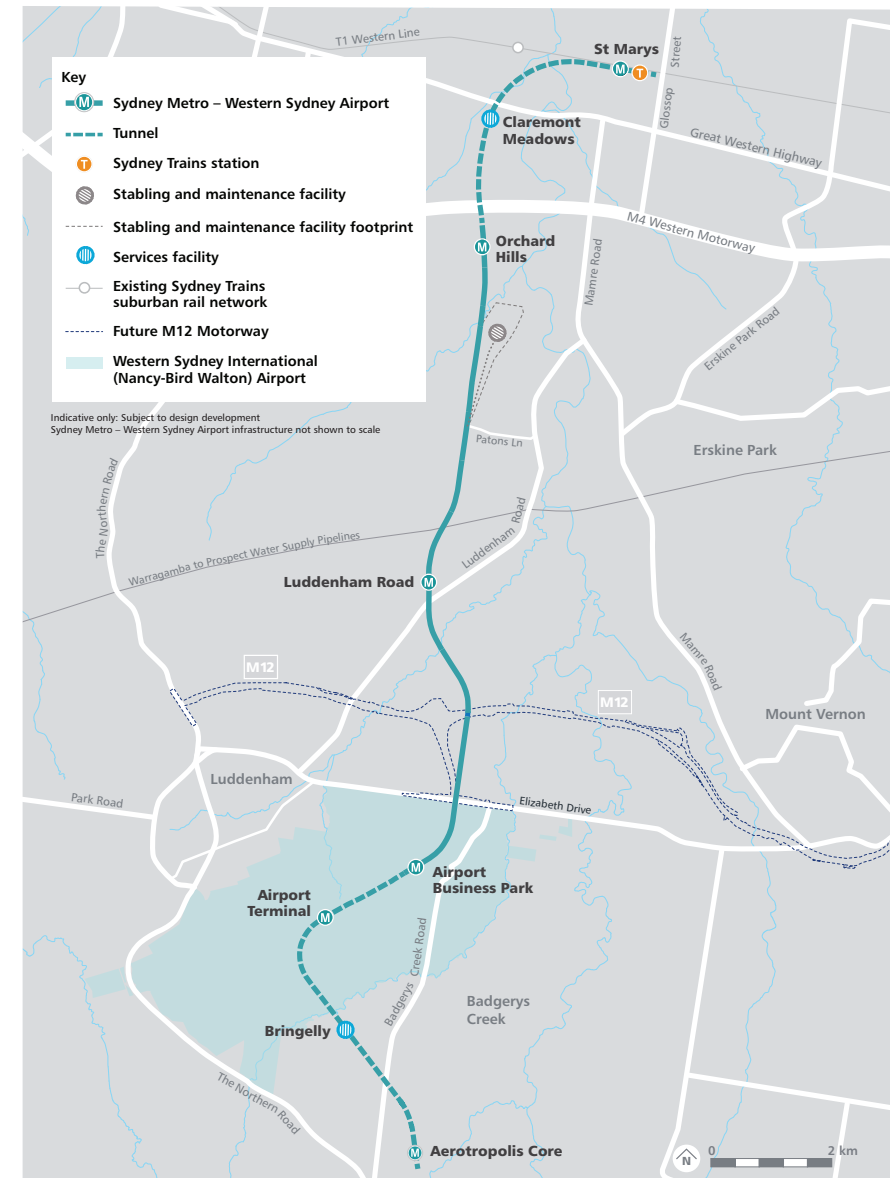
## 1.2 Project Scope

Sydney Metro - Western Sydney Airport involves the construction of a new metro rail line between St Marys and the Western Sydney Aerotropolis, servicing the new Western Sydney International Airport, currently under construction. The project will deliver six new metro stations at:

- St Marys
- Orchard Hills
- Luddenham Road
- Airport Business Park
- Airport Terminal
- Aerotropolis Core.

Key project features include:

- A new metro railway line around 23 kilometres in length between St Marys in the north and the Aerotropolis Core precinct in the south
- Around 4.3 kilometres of twin rail tunnels between St Marys and Orchard Hills
- Around 10 kilometres of rail alignment between Orchard Hills and Western Sydney International, consisting of a combination of viaduct and surface rail alignment
- Around two kilometres of surface rail alignment within Western Sydney International
- Around 3.3 kilometres of twin rail tunnels (including tunnel portal) within Western Sydney International
- Around three kilometres of twin rail tunnels between Western Sydney International and the Aerotropolis Core
- Convenient interchanges with other forms of transport including trains and buses.
- All stations will meet the needs of pedestrians, cyclists, customers catching or getting off buses and taxis, and people being dropped off and picked up in cars.
- Fully accessible stations with platform screen doors.
- New stations designed for passenger comfort including environmentally friendly features like natural ventilation and natural lighting.



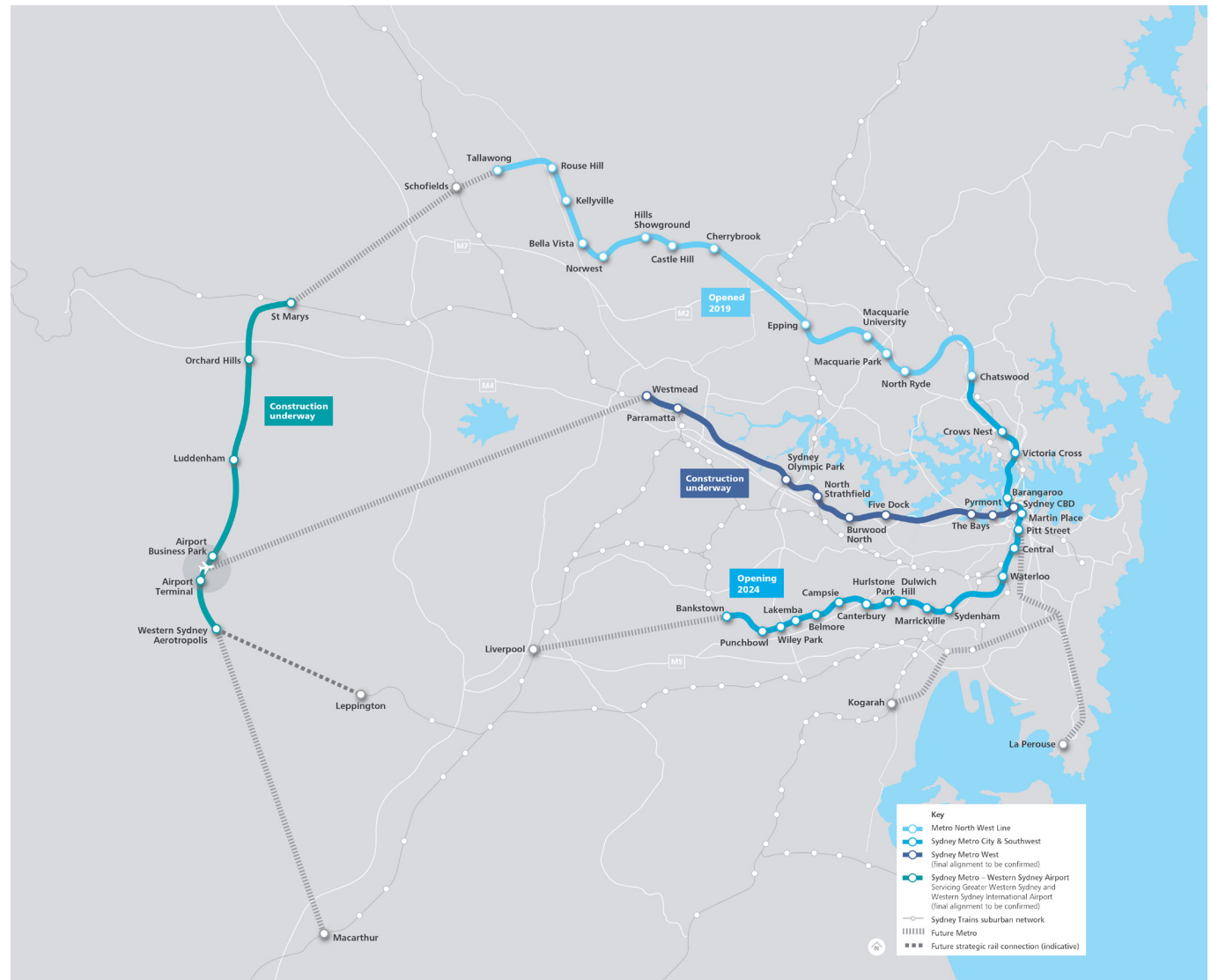
## 1.3 Project Vision

Transport for NSW's vision for Sydney Metro is:

*“Transforming Sydney with a new world class metro.”*

Sydney Metro's mission is to deliver a world class, connected metro, which will provide more choice to customers and opportunities for our communities now and in the future.

Sydney Metro presents a unique opportunity to demonstrate an exemplary approach to integrated transport and land use planning. Quality architecture, good urban design and a user friendly and inter-connected transport system are critical to ensuring that Sydney Metro meets customer needs and expectations and maximises their city shaping potential and broader urban benefits.



## 1.4 Sydney Metro Design Objectives

To help meet the transformational vision and world class aspirations of the project, five **Design Objectives** for the project have been developed to guide decision making and the design process for the Sydney Metro projects.

A **Design Principle** is prescribed under each design objective, describing the intention of the objective for the design of stations, station precincts and the wider Metro corridor.



### Objective 1: Ensuring an easy customer experience.

#### Principle

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 2: Being part of a fully integrated transport system.

#### Principle

Sydney Metro - Western Sydney Airport 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 3: Being a catalyst for positive change.

#### Principle

Sydney Metro - Western Sydney Airport provides a singular generative opportunity for Western Sydney. New stations that engage meaningfully with their context, and associated development in station precincts, will raise the quality of the urban environment and enhance the experience of the wider city.

### Objective 4: Being responsive to distinct contexts and communities

#### Principle

Distinctive station architecture and public domain design will seek to express an appropriate sense of place that is relevant to existing and emerging Western Sydney communities.

### Objective 5: Delivering an enduring and sustainable legacy for Sydney.

#### Principle

Sydney Metro will leave a positive legacy for future generations. A high standard of design and functionality across the corridor, stations and precincts is the means to ensure an enduring legacy.

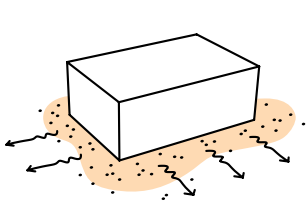


## 1.5 Sydney Metro - Western Sydney Airport Urban Design Principles

A set of corridor-wide urban design principles have been developed to ensure that, while all stations contribute to local character, they are also part of a network and together contribute to a corridor of activity centres that offer social, employment and housing opportunities.

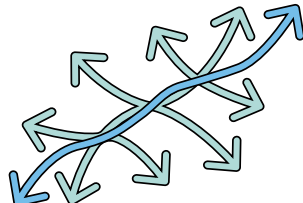
These principles will guide precinct design that speaks to the history and sense of place of the South Creek corridor. Design of places that also builds connections to, and between, station precincts. The principles underpin aspirations for best practice urban design and sustainable development.

The principles below have been developed to guide urban and precinct design for the project:



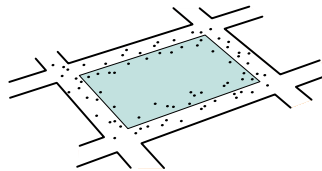
### Interface and Activity

Activation of the urban realm of station precincts is important to ensure stations and supporting infrastructure are integrated with existing and future urban settings.



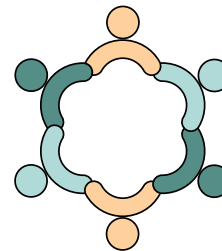
### Connectivity

Walkable urban environments and integration with the planned Blue-green Grid of the Western Parkland City are best through the provision of safe, permeable and well-connected station precincts.



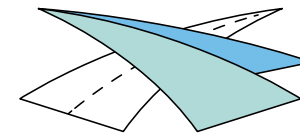
### Place Making

Sydney Metro has the ability to support and contribute to the delivery of unique, attractive and vibrant urban centres, streets and spaces that provide a sense of connection and identity for local communities and visitors.



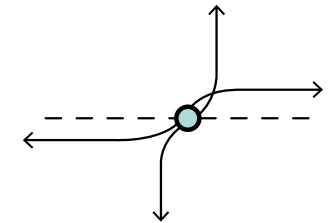
### Culture

Opportunities to reflect and build on the rich Aboriginal and non-Aboriginal heritage of Western Sydney will strengthen design and place outcomes.



### Sustainability

Sydney Metro will contribute to the evolution of a new urban development paradigm in which environmentally sustainable elements, processes and designs are incorporated in the project.



### Transport Network

The Transport for NSW transport modal hierarchy will guide the design of stations, interchanges and associated developments, prioritising walking and other modes of active transport.

## 1.6 Towards Aboriginal Cultural Design Principles for Sydney Metro - Western Sydney Airport

In September 2019, as part of the Sydney Metro - Western Sydney Airport Definition Design, an initial 'Designing with Country' report was produced, the aim of which was to inform the development of appropriate Aboriginal Cultural Design Principles that might inform the design, public art and heritage interpretation of the project. This document outlined the policy, site and social context of the project. It drew attention to Transport for New South Wales Reconciliation Action Plan 2019-2021 deliverables, specifically the requirement for Transport cluster agencies to:

**“...make a positive difference to Aboriginal and Torres Strait Islander peoples in areas such as employment, empowerment and economic development, and to enhance and develop cultural understanding”.**

The report also called out three particular actions with application to Sydney Metro projects:

Action 1: Establish and maintain mutually beneficial relationships with Aboriginal and Torres Strait Islander stakeholders and organisations...

Action 10: Promote respect for Aboriginal heritage and increase inclusion of Aboriginal art...

Action 11: Embed Aboriginal and Torres Strait Islander co-design principles across Transport Cluster projects...

The context of the Sydney Metro - Western Sydney Airport alignment was described in detail, with sections outlining the Aboriginal heritage of south-western Sydney, the corridor landscape and the archaeological, historical and contemporary social contexts. The project traverses the country of three Local Aboriginal Land Councils - the Deerrubbin, Gandangara and Tharawal. As noted elsewhere, Western Sydney is home to the largest Aboriginal population in the country, with approximately 9% of the national Aboriginal population.

The report also included a precedent or benchmarking review that illustrated projects where Aboriginal authority has been embedded in the planning of projects and/or Aboriginal designers or artists have been a part of design teams.

The recommendations and ideas that this preliminary piece of work generated included:

- Respective and collaborative engagement
- Interconnectedness with Country
- The reflection of Aboriginal cultural values and narratives at a range of levels and locations, in form, shape, colour, texture, materiality etc.
- That outcomes not be tokenistic or simplistic
- That outcomes be immediately visible to users as iconic markers
- Individual identities for each station, but with an overall unifying narrative or theme
- That responses be appropriate to an international gateway

The opportunities identified included:

- Line wide interpretation strategy identifying key stories, themes and opportunities
- Architectural form reflecting connection to Country
- Integrated design features
- Landscape design and interpretation - six Dharawal seasons
- Rolling stock - journeying or story images
- Naming of stations or components in Darug language
- Alignment features such as portals, cuttings, viaduct informed by design principles



## 1.6 (cont.) Aboriginal Cultural Design Principles - Government Architect NSW

### Designing with Country

In March 2020 the Government Architect NSW published a discussion paper aimed at those involved in creating the built environment of the state. The paper is the prelude to a foreshadowed engagement process with Aboriginal community members, recognised cultural knowledge holders, design and planning industry experts and government representatives that will inform the development of Cultural Design Principles, and ultimately a framework for their application to government projects.

For Aboriginal people, Country is their place of origin, in cultural, spiritual and literal terms; it includes land, sky and water. Country incorporates both the tangible and the intangible. <sup>(1)</sup>

The design related ideas articulated in the discussion paper are:

#### Country

- Relates to the nation or cultural group, and the land they belong to, yearn for, find healing from and will return to

#### Landscape

- Aboriginal values of landscape cover multiple scales, from large scale meaning and symbolism, to detailed land management

#### Cultural Amnesia

- Colonisation, with its disruption to Aboriginal landscape, people and cultural practices, has over time created a collective amnesia regarding this history - gaps in memory can be restitched together if dormant Country can be reactivated

### Designing with Country

- Three elements of integrated design - Biophilic,

Architectural and Passive design - a nature and people based approach

#### Connection to Country

- Walking Country and storytelling as the means to understand sites, cultural lore and wayfinding

#### Country centered design

- Consideration of all natural systems - people, animals, plants and resources

#### Mapping

- Beyond the physical - mapping an Aboriginal understanding of landscape

### Concept and Detailed Design

The next design stages of the Sydney Metro - Western Sydney Airport project will commence ahead of Government Architect NSW's ongoing work on development of Cultural Design Principles. Given this, it is intended that the project will include, in design development, an engagement process with local Aboriginal communities, elders and knowledge holders to develop appropriate themes or narratives for use in either design, heritage interpretation or the public art components of the project.

Sydney Metro will seek to engage with people, and the place, in an effort to better understand the heritage, landscape, materials, stories and relationships of this part of western Sydney. At the same time, the design team will identify places, spaces and elements along the corridor, at stations and in precincts that are suitable for design, public art or interpretation interventions. It is intended the outcomes of this process will then inform the design briefs for the detailed design of the project.

(1) Dr Daniele Hromek (Budawang / Yuin), quoted in Designing with Country discussion paper, Government Architect New South Wales, March 2020

## 1.7 Customers

*“The Customer is at the centre of everything we do.”*

### Easy Sydney Metro experience

An experience can be defined as the absence of unnecessary effort.

This creates an experience that a customer does not have to think or work hard to achieve their goals. The easier an experience feels, the more likely a customer is to continue using a service.

Effort can be divided into two types:

- Physical effort: which is the energy a customer has to exert, and
- Cognitive effort: which is the thinking, planning, and physiological energy a customer expends

### Designing for all customers

Our customers are at the centre of everything we do at Sydney Metro, and it's essential to recognise that not all customers are the same.

To design for a diverse group of customers, we have developed four personas to understand their needs, challenges, and expectations on how they will use the service.

### Meet our customers

 <p><b>DIRECT DAVI</b></p> <p>I am task driven, motivated and competitive. I'm always busy and can't afford to disrupt my routine by being late.</p> <p><b>SYNDEY METRO CAN MAKE IT EASY FOR ME BY:</b></p> <ul style="list-style-type: none"> <li>• Providing me with frequent and reliable trains</li> <li>• Creating efficient station connections and clear sightlines</li> </ul>	 <p><b>CURIOUS CHO</b></p> <p>I am inquisitive, logic driven but tend to over think things. I need mobility assistance, so before I travel anywhere, I must plan everything so I know I've made the right choice.</p> <p><b>SYNDEY METRO CAN MAKE IT EASY FOR ME BY:</b></p> <ul style="list-style-type: none"> <li>• Making station facilities accessible and available for me</li> <li>• Creating well-lit spaces, and access to help when I need it</li> </ul>	 <p><b>FRIENDLY FRED</b></p> <p>I am community minded and observant. These days I've noticed that people can be unfriendly, rude or in a rush. I prefer to take my time</p> <p><b>SYNDEY METRO CAN MAKE IT EASY FOR ME BY:</b></p> <ul style="list-style-type: none"> <li>• Building available spaces for me to rest and avoid crowded areas</li> <li>• Informing me through communications which have directional icons, landmarks and high contrast colours</li> </ul>	 <p><b>PROTECTIVE PAT</b></p> <p>I am organised, practical and caring. My loved ones rely on me to be there and keep them safe.</p> <p><b>SYNDEY METRO CAN MAKE IT EASY FOR ME BY:</b></p> <ul style="list-style-type: none"> <li>• Providing clearly marked help points which allow me to feel safe and secure</li> <li>• Creating spacious areas that allow our group to move at a slower pace</li> </ul>
---	--	---	--

## 1.7 Customers (cont.)

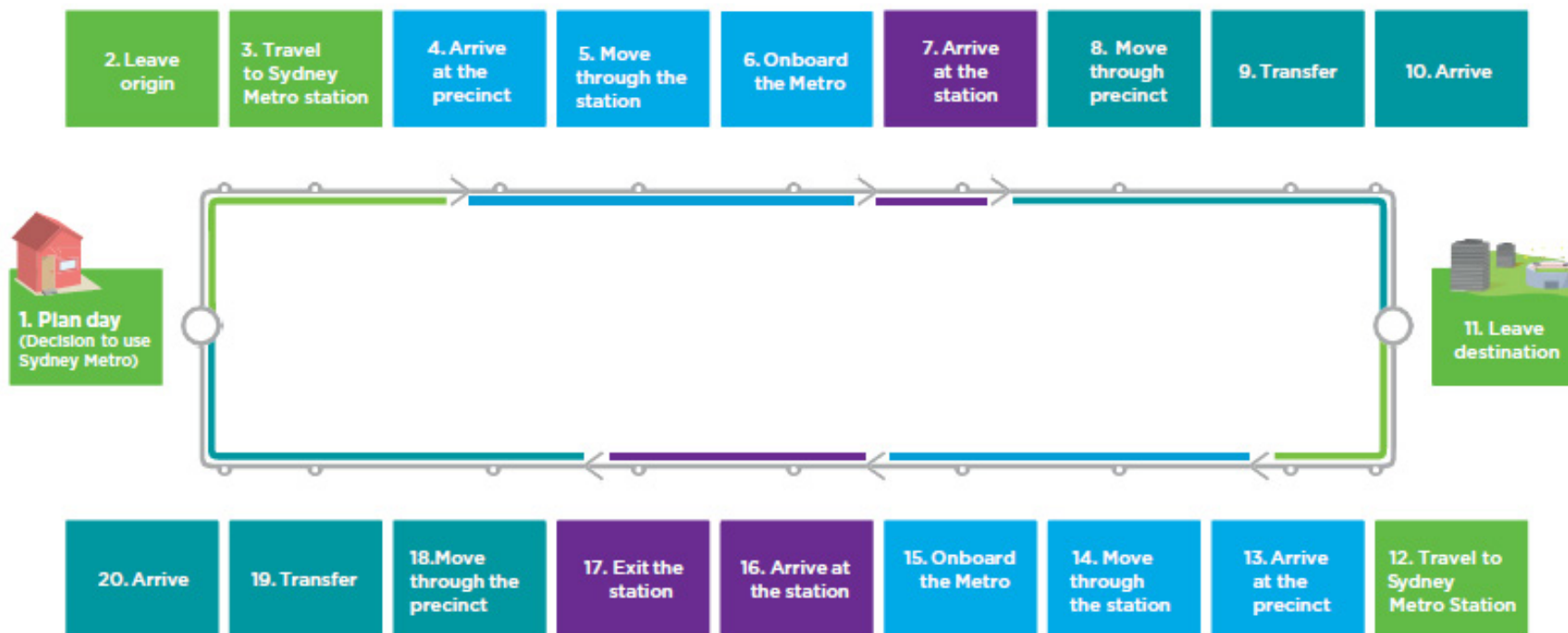
### An easy customer journey

A customer's experience starts long before they arrive at a Sydney Metro station.

Research has shown that customers see their journey from door-to-door-to-door (from origin to destination and back again). Customers' decision to use Sydney Metro starts at home. Their choice of transport is based on their perception of ease across their door-to-door-to-door journey. A customer's experience begins when they establish a need to travel and plan how they will get to their destination whether

it's by car, walking, cycle, bus, train, metro or other means. If our stations are too hard to get to and use, customers may not use our service.

Customers will progress through many journey stages in their door-to-door-to-door journey. By considering customers' needs at each journey stage, we can design a whole journey experience and focus on stages where customers have to exert the most effort.

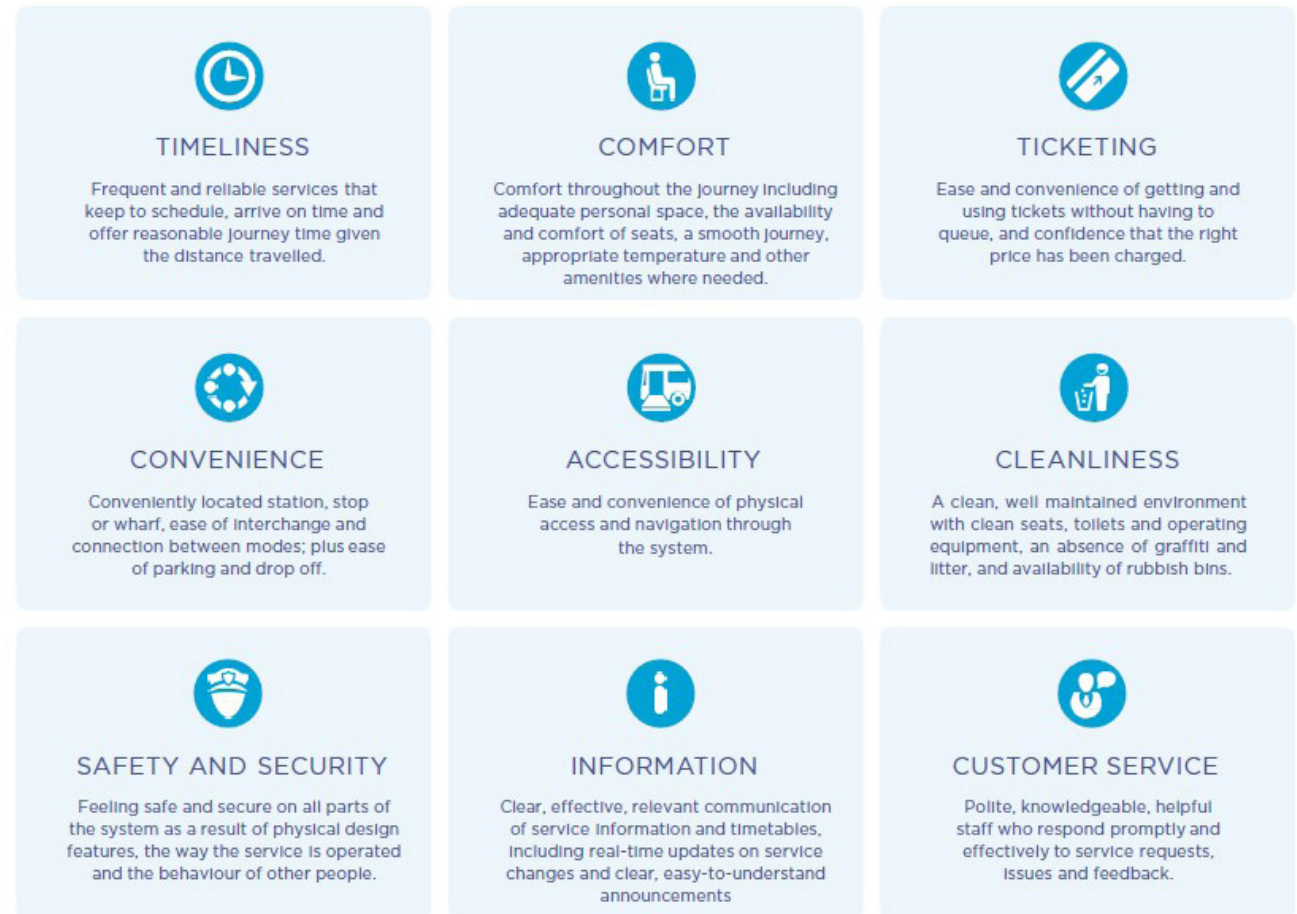


## 1.7 Customers (cont.)

### Measuring customer satisfaction

Through engagement with customers across the network, Transport NSW has identified nine drivers of customer satisfaction.

These are fundamental outcomes that customers expect transport service to deliver. The customer satisfaction drivers are built into the operator contracts and set as key performance indicators (KPIs) across all of the transport services. The interactions that customers have with these drivers will directly impact how they perceive their experience when they use Sydney Metro. Understanding the performance of these drivers is critical to evaluate ease of experience.



## 1.8 Transport Integration

Transport integration considerations of the project delivers on Sydney Metro's commitment to a reliable 'door-to-door-to-door' transport solution for all customers. This is achieved by planning for a seamlessly integrated experience with all modes of transport that moves customers around safely, quickly and easily, and that is adaptive to change.

Within the Western Parkland City, the project has potential to act as an effective transport spine, both supporting and being supported by local road, bus, and active transport networks. Connections with Western Sydney International and the T1 Western Line at St Marys will also link the Western Parkland City to other key centres within and outside of NSW.

Well-functioning transport interchange facilities determine the overall effectiveness of the public transport network, particularly in increasingly complex urban environments. Effective transport integration includes well-designed interchanges, co-location of physical infrastructure, such as bus stops, bike storage and pedestrian connections near station entrances, and alignment of service delivery and operations across networks. These work to create synergies in the door-to-door-to-door journey and facilitate ease of use, creating a better experience for customers and reducing travel times. It also creates opportunities for efficiencies in delivering transport services.

## 1.9 A Commitment to Safety

Transport for NSW is committed to ensuring Sydney Metro is designed, constructed and operated in a manner that facilitates safe working and customer passage. The project will provide facilities for customers, staff and contractors that meet or exceed any required safety standards. Sydney Metro will also comply with all relevant statutory and regulatory requirements in respect of safe system design, delivery and operation.

Safety will be considered at all stages of design across all aspects of corridor and station planning, construction, operation and maintenance. In particular, the design of Metro infrastructure in the city must provide safe interfaces between stations and the existing urban environment. The safe movement of customers, staff and contractors through station areas needs to be facilitated through many aspects of physical design, including provision of adequate platform capacity and circulation space, clear routes, adequate lighting and slip resistant flooring, as well as by minimising obstructions and eliminating crush zones.

**Station and public realm design** will identify and reflect current architectural and engineering best practice with respect to safety. Guidelines and protocols, such as Crime Prevention through Environmental Design (CPTED), will also be important benchmarks in minimising the risks of personal harm, operational disruption and conflict.

**Construction and operational safety** will be managed through a rigorous safety in design process which will identify, develop and implement safety controls, and enhance the construction, operational and maintenance outcomes.

**Maintenance and asset management strategies** will be adopted that reduce risk through safety auditing and reporting. Sydney Metro will have a comprehensive framework to avoid or minimise risk, and to enhance safety, without unreasonably reducing amenity and functionality.



## 1.10 A Commitment to Sustainability

Sydney Metro has a clear vision to deliver and operate infrastructure and assets that are environmentally responsible, socially beneficial and demonstrate best practice environmental sustainability. This means ensuring sustainability informs and is core to the metro product.

Six sustainability principles govern the environmental and socio-economic outcomes and performance at Sydney Metro. These principles are designed to deliver on the Transport for NSW Environment and Sustainability Policy commitments, and are identified based on best practice endeavours on past metro projects, emerging needs and trends and wider government policy. The following project-specific principles will form part of the Sydney Metro - Western Sydney Airport Sustainability Plan.



### Demonstrate leadership

Deliver a world class metro that is environmentally and socially conscious, and demonstrates innovation



### Tackle climate change

Integrate a comprehensive climate change response, and drive excellence in low carbon solutions



### Manage resources efficiently

Achieve whole-of-life value through efficient use and management of resources



### Drive supply chain best practice

Collaborate with key stakeholders to drive a lasting legacy in workforce development, industry participation and sustainable procurement



### Value community and customers

Respond to community and customer needs, promote heritage, liveable places and wellbeing for current and future generations



### Respect the environment

Minimise impacts and take opportunities to provide environmental improvements

## 1.11 Structure of the Guidelines

The Design Guidelines are structured into four sections:

### 1. Introduction (this part)

Provides an overview of Sydney Metro - Western Sydney Airport, the project objectives, design principles, an understanding of our customers' needs and the importance of design in meeting those needs.

### 2. Stations

Outlines the key contextual factors and design drivers that inform the design of the station and surrounding environment.

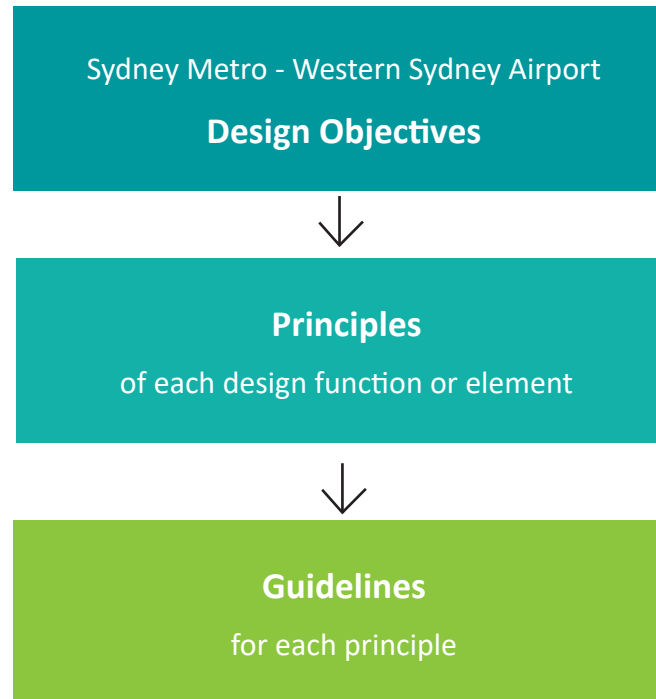
### 3. Function & Experience

Outlines the principles and design guidelines to be applied to the design strategies for stations and their interface with adjoining areas.

### 4. Elements

Outlines the principles and design guidelines to be applied to the elements of the new stations and their interface with adjoining areas.

Sections 3 and 4 are structured in the following way:





## 1.12 Application of the Guidelines

### Review of Design

The design of Sydney Metro - Western Sydney Airport will be subject to internal review processes to ensure design responds to these Guidelines. The internal review process is one means to maintain a level of quality that will meet the needs and expectations of Sydney Metro customers and the people of NSW. The Guidelines will also be reviewed as the project moves through detailed design and procurement stages to keep them current and relevant.

The design of Sydney Metro and implementation of these Guidelines is also subject to independent review by the Sydney Metro Design Review Panel. The objective of the Design Review Panel is to provide independent, high-level design review of the project. This will assist in the project meeting design objectives and achieving quality design outcomes.

The Design Review Panel will be chaired and supported by suitably qualified and appropriately skilled professionals from the fields of architecture, urban design, landscape design and heritage architecture. The Design Review Panel will be supported by specialist advisers in the fields of community integration, transport integration, sustainability and cultural heritage, as required.

These panel members will provide independent design review and advice periodically throughout the development of the design. They will maintain an ongoing review role in the design process for the project, ensuring that as the design of individual components develops, it delivers on the principles contained in this document.

### Updating the Guidelines

These Guidelines may be updated from time to time through the project delivery stage, including application of the Guidelines in relevant contracts. It is envisaged that future updates will provide additional detail and guidance as design progresses. The objectives and principles contained in this version of the document would continue to apply in subsequent versions. Updated versions of the Guidelines will be subject to the review and endorsement of the Design Review Panel.



The background is a solid teal color. A diagonal line of light blue circles of varying sizes runs from the bottom-left towards the top-right, creating a sense of movement and depth.

## Part 2

# Stations

## About this Section

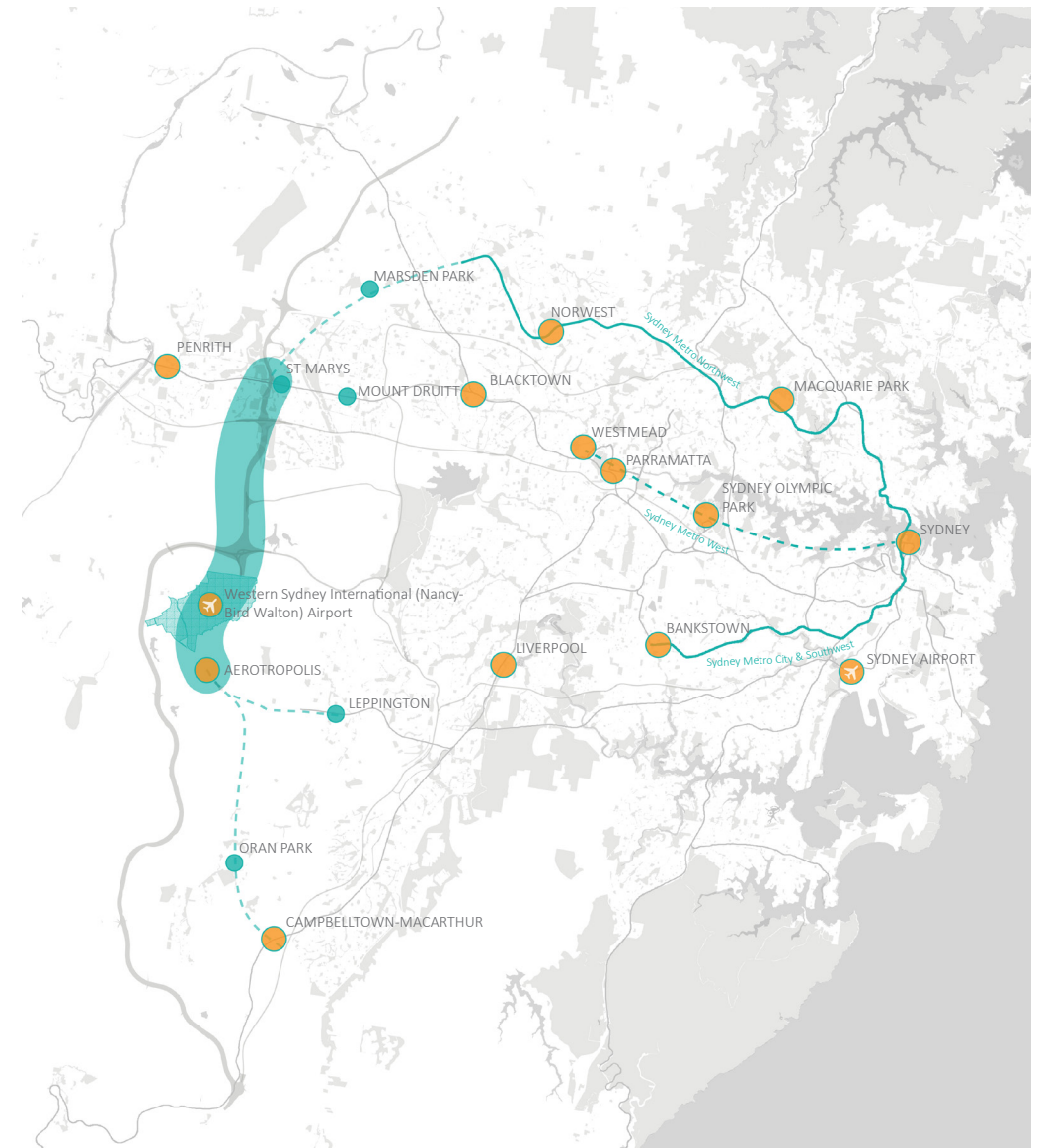
This section describes the context and functional character of the corridor and metro stations. It acknowledges the existing conditions and urban interfaces of each station in order to inform the delivery of contextually responsive and integrated environmental outcomes.

The urban and public domain design must be developed with reference to the existing or desired future / emerging urban context and infrastructure - including built form and public domain conditions, landscape character and existing and proposed services - as well as planned initiatives in the locality.

New metro stations are proposed at:

- St Marys
- Orchard Hills
- Luddenham Road
- Airport Business Park
- Airport Terminal
- Aerotropolis Core

Key descriptors for each station are noted in this section including; centre type, primary function (e.g. origin/destination), catchment type, and Local Government Area. An outline of the transport role and function and geographical catchment of each station, including the key design drivers for the station precinct, are also set out in the following pages.



*The Sydney Metro - Western Sydney Airport corridor in the context of Greater Sydney. Source: COX*

## Corridor Context

### Culture, Place and Character

The Sydney Metro - Western Sydney Airport line will traverse the future Western Parkland City (WPC). The Parkland City is the western complement to the central and eastern cities, as envisaged by the Greater Sydney Commission in the Greater Sydney Region Plan. The western city lies within the broader Greater Western Sydney (GWS) region that extends from Windsor in the north to Campbelltown in the south, and from Parramatta in the east, to Penrith and the Blue Mountains in the west. The Parkland City will cover over 800 square kilometres of this area.

The 2016 Western Parkland City population of 1,070,000 is forecast to increase by 43% by 2036.<sup>1</sup>

The Greater Western Sydney region is home to more than 1.9 million people, 38.6% of whom were born overseas. Residents of Western Sydney are drawn from more than 170 countries and speak over 100 distinct languages. 60% of new immigrants to Australia settle in the Greater Sydney region. Between 2011 and 2016, the number of people born overseas increased by 18% and the greatest proportional growth in this period in overseas born populations was in people born in India, China, Iraq and Pakistan. Approximately 12% of the Greater Western Sydney population do not speak English well. The region also has the largest Indigenous community of any Australian region and is on average slightly younger than the rest of Sydney.<sup>2</sup>

Across the region, 41.6% of households were composed of couples with children in 2016, compared with 35.3% in Greater Sydney. 12.8% of households were one parent families while 16.7% were lone person households and couples without children made up 20%. 62% of these households were purchasing or owned their house, 24.25% were renting privately and 6.1% rented social housing. The region has a relatively high proportion of low income families and high school retention rates are the lowest in the Sydney

metropolitan area. Although Greater Western Sydney has higher than average employment levels, salaries are lower than average. The region is heavily car dependent, and 75% of workers who live in GWS also work there.<sup>3</sup>

The project alignment generally follows the South Creek corridor, from south of Badgerys Creek at its southern end to St Marys township in the north. It lies in the central zone of the Cumberland Plain of the Sydney Basin, an area of gently rolling hills, broad drainage lines and prominent rises. The South Creek system covers approximately 400 square kilometres. The creek's headwaters are in the Camden area to the south and it flows some 70 kilometres north to the Hawkesbury River. South Creek is Western Sydney's longest urban freshwater creek.<sup>4</sup> Meandering and often ephemeral creek lines cross the alignment. A further distinctive feature of these plains is the mosaic of farm dams that dot the pastoral landscape. The average annual rainfall in the catchment is 750mm.

### Indigenous Western Sydney

Sydney Metro - Western Sydney Airport traverses areas recognised as the traditional lands of the Darug and Gandangarra peoples. Lands traditionally belonging to the Dharawal people lie to the south of the alignment.

"The Dhar'rook (Darug) and Gun'dungur'ra tribes respectively occupied the country from the mouth of the Hawkesbury River to Mount Victoria, and thence southerly to Berrima and Goulburn, NSW. On the south and southeast they were joined by the Thurrawal."<sup>5</sup>

Of the Darug clans, the "... Gomerrigal-Tongarra clan have a particular association with South Creek, using this area as a meeting place".<sup>6</sup>

In the 1940s and 1950s as Australian cities urbanised, greater numbers of Aboriginal people migrated to Sydney where work was plentiful. The NSW Housing Commission provided

public housing in the city, including housing specifically for Indigenous people. Much of this housing was in western Sydney, particularly on estates at Green Valley and Mt Druitt.

Western Sydney today has the largest Aboriginal and Torres Strait Islander population of any Australian region<sup>7</sup>. While 9% of the national indigenous population live in Greater Sydney, more locally 4% of the overall population of the Penrith Council area are indigenous, as are 2.8% of the Blacktown Council area<sup>8</sup>.

### Land Use

Current land uses in the WPC include established urban areas like St Marys, more recent urban development in places such as Caddens in the north and Harrington and Oran Park in the south, along with traditional rural, semi-rural and agricultural uses and extensive areas of rural/residential housing on larger lots.

Western Sydney is distinctive for its generally low-density suburban subdivisions and built form. More recent development, however, has included higher density infill development in town centres and a gradual movement towards smaller subdivision for detached dwellings and an increase in the contribution of dual occupancy and attached dwelling typologies to the overall housing mix.



### Corridor Landscape

Typically, the pre-existing landscape of the Cumberland Plains was characterised by open woodland with trees well spaced and approximately 30% canopy coverage. A grassy understorey dominated by *Themeda triandra* (Kangaroo Grass) was common, and generally the understorey featured more herbs and grasses than shrubs. Cumberland Plains Woodland was generally found on heavier clay soils, with *Eucalyptus molucana* (Grey Box) the dominant tree on higher ground and *Eucalyptus tereticornis* (Forest Red Gum) on lower slopes and depressions. Shale Sandstone Transition Forest communities occurred at the edges of the Cumberland Plain where shale soils met sandstone while Sydney Coastal River Flat Forest (Alluvial Woodland) communities were found on the moister, more fertile, alluvial soils of the creek lines and floodplain. The Ironbarks – *Eucalyptus crebra* and *Eucalyptus fibrosa* were also found on hilly country while less well drained areas featured *Eucalyptus amplifolia* (Cabbage Gum), *Eucalyptus baueriana* (Blue Box) and *Eucalyptus bosistoana* (Coast Grey Gum), along with *Casuarina glauca* (Swamp Oak) and *Melaleuca decora* (Paperbark).<sup>9</sup>

Around Bringelly, where the Aerotropolis urban centre is proposed, the land is generally cleared with a covering of pasture grass. Fragmented stands of native vegetation remain, typically along creek lines. These remnant areas of riparian forest have been mapped as areas of the endangered Alluvial Woodland while other discrete areas of Plains Woodland are found on higher ground. These are associated, or sub-communities, of respectively, the Cumberland Plain and Shale Sandstone Transition Forest ecological communities, namely Shale Plains Woodland and Shale-Gravel Transition Forest.<sup>10</sup>

The topography of this southern zone is gently undulating, with the higher ground at Bringelly giving way to the low-lying areas along South Creek and Thompsons Creek.

The border between the future Aerotropolis Core and the Western Sydney International Airport is Badgerys Creek, along the banks of which are remnant areas of Alluvial Woodland, more specifically Sydney Coastal River Flat Forest, a community dominated by *Casuarina glauca* (Swamp Oak). The airport site itself will be gradually cleared and levelled.

North of the airport the floodplain of South Creek and its tributaries constitute the topography and landscape of the corridor. The ground is also undulating from Elizabeth Drive through Luddenham to Orchard Hills, with localised depressions where Claremont, Blaxland and Cosgroves Creeks join South Creek. Higher ground around Claremont Meadows grades down to a relatively flat plain between Werrington and St Marys.

The northern zone is also largely cleared, or disturbed, with relatively isolated patches of remaining native vegetation. Again, areas of Alluvial Woodland are concentrated on the alluvial soils of the riparian zone of the flood plain. There are also scattered areas of Shale Plains Woodland growing on the heavier clay soils found on higher ground.<sup>11</sup>



*Themeda triandra* (Kangaroo Grass)  
Source: Wikipedia



*Melaleuca decora* (Paperbark)  
Source: Wikipedia

### Western Parkland City

*“The District is the hottest and driest part of Greater Sydney and its population will grow significantly over the next 40 years”.<sup>12</sup>*

*“As the South Creek corridor is developed, the creek and its tributaries will form the defining structural elements of the new Western Parkland City, its centres and its neighbourhoods.”<sup>13</sup>*

Infrastructure NSW, in a collaboration with the Greater Sydney Commission (GSC), has been developing a whole of corridor approach to the urbanisation of the South Creek corridor, with landscape and water central to the urban vision of creating a “cool and green parkland city”.<sup>14</sup>

This work has a focus on integrated water management that aims to retain water in the landscape for its cooling, amenity and productive potential, as well as to regulate storm water flows. Related planning development objectives aim to orient urban development around the amenity of the region’s waterways and to provide green space and/or water bodies within 400 metres of all new housing. Further, a new urban development model proposed by the GSC envisages 8,000 trees per hectare compared the 2,000 trees cited in the Business as Usual model.<sup>15</sup>

*“The NSW government has set a target to increase tree canopy cover across Greater Sydney to 40%”.<sup>16</sup>*

Sydney Metro - Western Sydney Airport, as a lead project in the Parkland City, can contribute to this landscape vision. The project includes extensive areas of surface and elevated alignment with associated landscape areas adjacent to, or below, the alignment. Additionally, Sydney Metro will have a significant new presence in St Marys town centre and a formative influence in establishing the public domain in future town centres at Orchard Hills, Luddenham Road, Airport Business Park and Aerotropolis Core. At the airport

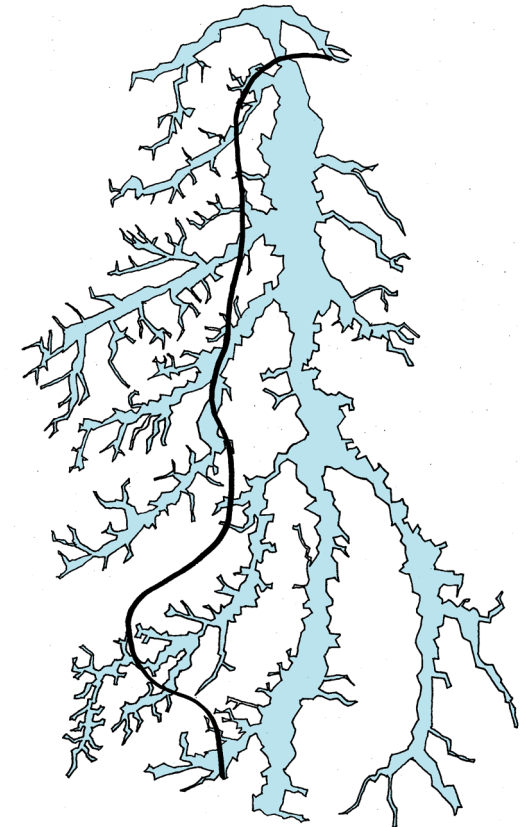
terminal the Metro station will become a key component of the landscaped urban plaza proposed between the terminals. This area will be developed by Western Sydney Airport Co.

### Urban design and landscape vision

The project aims to contribute to the restoration of the natural qualities of the South Creek catchment as well playing a catalytic role in the urban landscape of town centres on the alignment. This will translate into woodland style plantings where space and function permits on areas of surface corridor and areas beneath, or adjacent to, viaducts. Species selection will largely be made from a palette drawn from local ecological communities, along with consideration of species suitability for local environmental/climatic conditions.

Street tree plantings will primarily draw on a Cumberland Plains palette while planting choices for station plazas will largely be driven by ornamental and amenity considerations. Landscape design in existing and future urban areas will help establish a distinctive character for each station precinct. Design will seek to maximise the tree canopy in line with broader development objectives for the Western Parkland City.

The design of corridor landscapes will be informed by natural landscape patterns – landform, hydrology, vegetation – as well as consideration of active uses and significant views. Revegetation will feature in disturbed areas along the corridor and especially between areas of remnant endemic vegetation.



*The Sydney Metro - Western Sydney Airport alignment follows the South Creek corridor. Source: Sydney Metro*

## Active Transport

Active transport facilities will be investigated as part of the project, both local links to stations and linear paths along sections of surface alignment. Further links to adjacent open space and to waterways will be explored. Facilities should include rest stops at logical junctions or landscape areas where shade and views are available. Elements will be considered and delivered in accordance with the principles of the NSW Government's Draft Greener Places and The Sydney Green Grid.

## Western Sydney International Airport

Sydney Metro - Western Sydney Airport runs through, and includes two stations within, the Western Sydney International (Nancy-Bird Walton) Airport. There are a range of national and international non-mandatory standards, requirements and guidelines that seek to control the nature of land use adjacent to airports and related landscaping, on and off airport. These are designed to prevent or control wildlife strikes with aircraft. In particular, the National Airports Safeguarding Framework (NASF) Guidelines includes risk categorisation of land uses in the vicinity of airports. The guidelines cover zones at 3, 8 and 13km radially from airports and recommend a range of actions including mitigation measures and monitoring processes.

Landscape Design of the rail corridor immediately north and south of the airport will need to consider the attraction that landscaped areas may present to birds and other wildlife.

The development of the airport is the responsibility of Western Sydney Airport, an Australian Government-owned company.

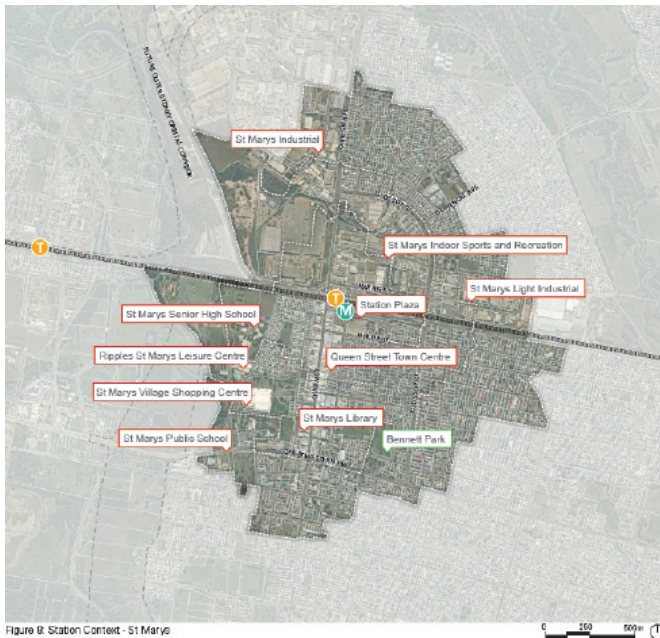
1. *Cultural Infrastructure Plan 2025+, Create NSW, 2019*
2. *Community Profile – The Centre for Western Sydney, Western Sydney University, 2016*
3. *Op. cit.*
4. *Western City District Plan, Greater Sydney Commission, p 111*
5. *Mathews R. H., The Gundungurra Language, as cited in Sydney Metro Greater West Definition Design Aboriginal Heritage Guidance Report, September 2019, Artefact, p11*
6. *Aboriginal History, Cumberland Council (2019), as cited in Sydney Metro Greater West Definition Design Aboriginal Heritage Guidance Report, September 2019, Artefact, p 12*
7. *City of Parramatta (2019), Aboriginal and Torres Strait Islanders, as cited in Sydney Metro Greater West Definition Design Aboriginal Heritage Guidance Report, September 2019, Artefact, p 31*
8. *Australian Bureau of Statistics (2016), Census Quick Stats, as cited in Sydney Metro Greater West Definition Design Aboriginal Heritage Guidance Report, September 2019, Artefact, p 31*
9. *Recovering Bushland on the Cumberland Plain: Best Practice Guidelines for the Management and Restoration of Bushland, Department of Environment and Conservation (NSW) 2005, Burton, Ruth. Chapter 1.*
10. *North South Rail Line and South West Rail Link occurred Corridors Draft Strategic Environmental Assessment, Transport for NSW, January 2018, pp 94-96*
11. *Op. cit, pp 68-70*
12. *Western City District Plan – Greater Sydney Commission, p 105*
13. *Op. cit., p 105*
14. *Western City District Plan – Objective 26, Greater Sydney Commission, p 112*
15. *A United Vision for the Western Parkland City, June 2018. Graus, P. Greater Sydney Commission Presentation*
16. *Western City District Plan, Greater Sydney Commission, (Objective 30), p 119*



## 2.1 St Marys

<b>Centre type</b>	Strategic centre
<b>Station function</b>	Destination, Origin, Interchange
<b>Local Government Area</b>	Penrith City
<b>Precinct vision</b> <i>A thriving mixed use strategic centre with a strong local identity, offering activity, smart connections and employment and housing diversity.</i>	

### St Marys 15-minute walking catchment



### Context

The St Marys Metro underground station will be located immediately adjacent to the Sydney Trains station to facilitate efficient interchange with the T1 Western Line and regional bus services. The 15-minute walking catchment will anchor the local retail strip of Queen Street, extend into North St Marys, and stretch south past the Great Western Highway.

The walking catchment encompasses significant major attractors including the town centre, and local employment and residential areas. Many of the attractors in the surrounding region are currently accessible by rail, bus services and private transport.

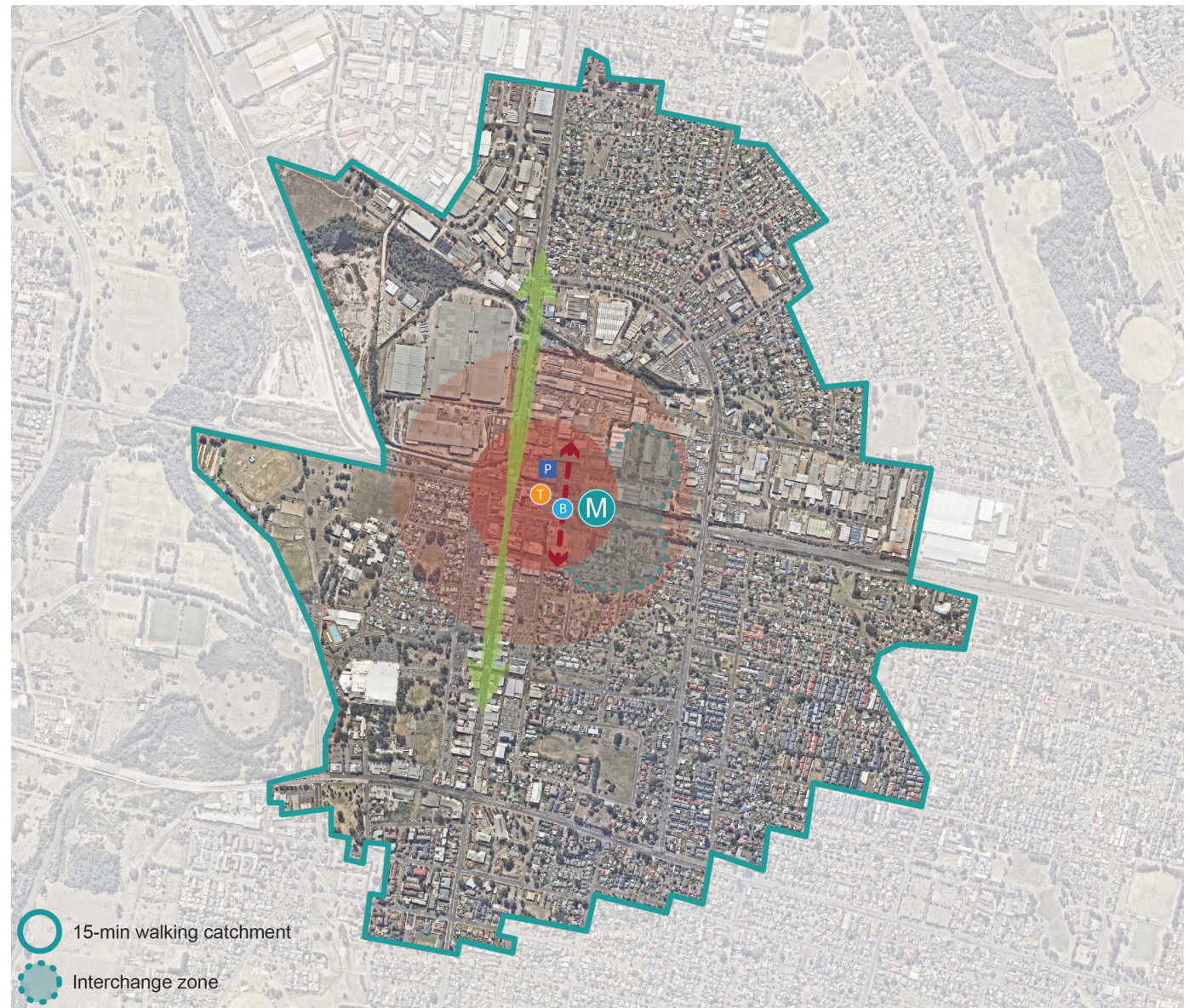
### Future Context

Movement will be facilitated by a walkable precinct layout and smart connections along high amenity green corridors. The preservation of heritage and environmental character will be the basis of a strong local identity, which will be further reinforced through an evolving creative and arts culture. The Queen Street corridor will be activated by attractive public spaces and a vibrant streetscape. This thriving mixed-use core will be buffered by transit-oriented medium- to high-density housing. A diversity of housing will be provided through a gradual outward transition into lower density uses. The employment function of the catchment will be further intensified and diversified as the existing industrial uses evolve in the long term into a mix of creative maker spaces, innovation and commercial uses.

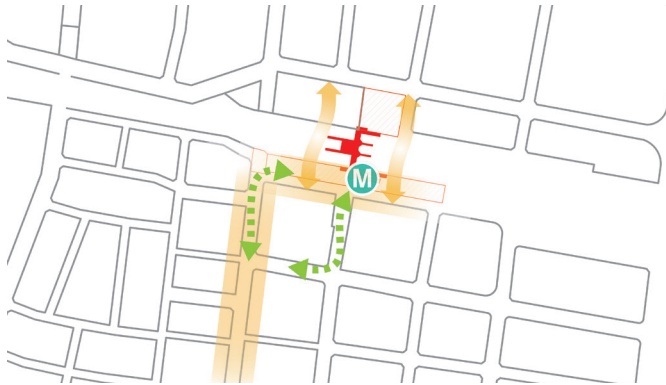


### Station and Design Drivers

- Provide an easy, efficient and accessible interchange with the T1 Western Line and bus services.
- Support St Marys strategic centre through promoting future employment growth and the Queen Street main street.
- Safeguard for future extension towards Schofields.
- Serve and support the revitalisation and continued renewal of the St Marys strategic centre both north and south of the T1 Western Line.
- Maintain and/or improve active cross corridor connections across the T1 Western Line.
- Consider integrated development opportunities.



## Urban Design Strategies



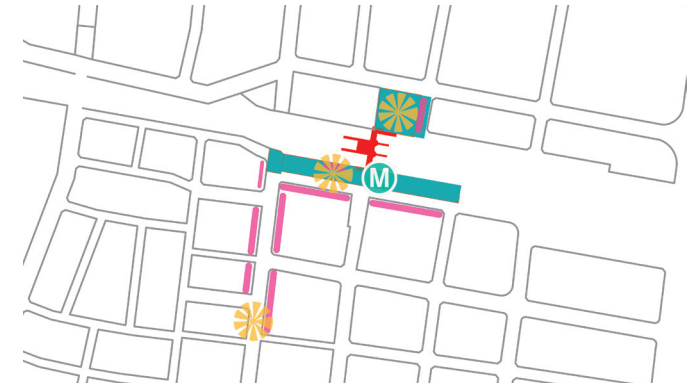
### Connectivity

- Maximise opportunities to improve north-south connectivity
- Prioritise physical and visual connection to Queen Street and other key activity areas
- Support an easy customer connection between the station and all other transport modes through clear way-finding signage, direct pedestrian connections and direct sight lines.



### Heritage, Environment and Sustainability

- Design station and surrounds to recognise, preserve and celebrate key heritage elements.
- Enable and prioritise the adaptive reuse of heritage assets to create a unique, interesting and active station precinct.
- Consider local landscape character in the design of the station precinct as well as the day and night time experience of the precinct.
- Plant trees within the station environment to soften the landscape, provide shade and reduce urban heat island effects.



### Interface, Activity and Place Making

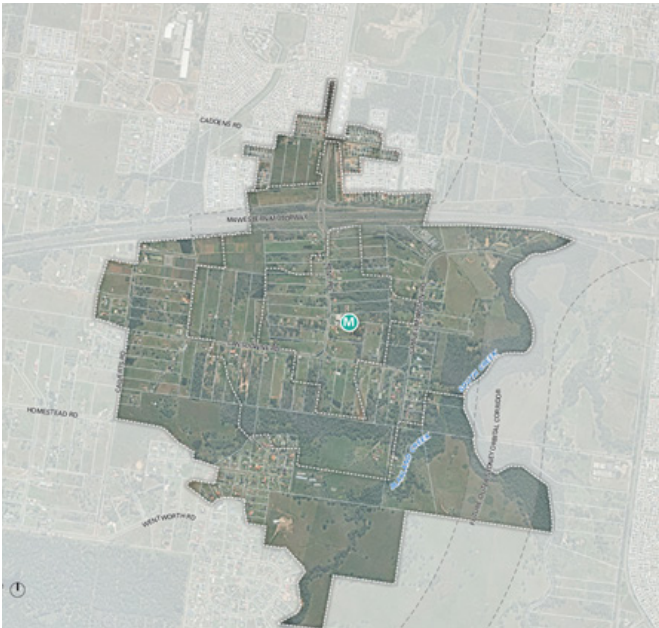
- Metro-led development at St Marys will include active building frontages and a high quality public domain that contributes to a safe and permeable station precinct.
- The interface between the station and plazas and key pedestrian links should support activity, diversity of use and visual richness.
- Integrate the station into the strategic centre context and provide complementary public spaces and activity to support quality place outcomes
- Enhance the quality of the public domain on both the north and south side of the station, including new street trees, paving upgrades and public art, especially along Station Street.
- Design of the northern entry and plaza should facilitate safe, convenient and visually attractive station arrival, and contribute to an evolving urban identity for St Marys north.



## 2.2 Orchard Hills

<b>Centre type</b>	Transit-oriented local centre
<b>Station function</b>	Origin
<b>Local Government Area</b>	Penrith City
<b>Precinct vision</b>	<i>A compact, high-amenity and walkable new residential community.</i>

Orchard Hills 15-minute walking catchment



### Context

The proposed Metro station at Orchard Hills will be located adjacent to Kent and Lansdowne Roads, and south of the M4 Western Motorway. The 15-minute walking catchment will stretch north into Claremont Meadows and extends east towards the suburb of St Clair.

A metro station in this location will provide connectivity to an area previously unserved by rail. This location currently contains large lot rural residential properties.

The proposed station catchment does not encompass any major attractors, it being a largely residential, dormitory suburb.

Many attractors in the wider surrounding region are not accessible by rail although some may be reached by existing bus services and of course by private transport.

The introduction of Metro creates the potential for mixed-use development around the station that will ultimately offer a range of local services and a lively urban setting. Transit-oriented high density housing is envisaged adjacent to the mixed-use core. Diversity of housing choice will be provided as development transitions to lower density form as it moves further from the station.

The precinct will be largely residential, providing compact housing in a key location with access to employment, education, recreation and other services.

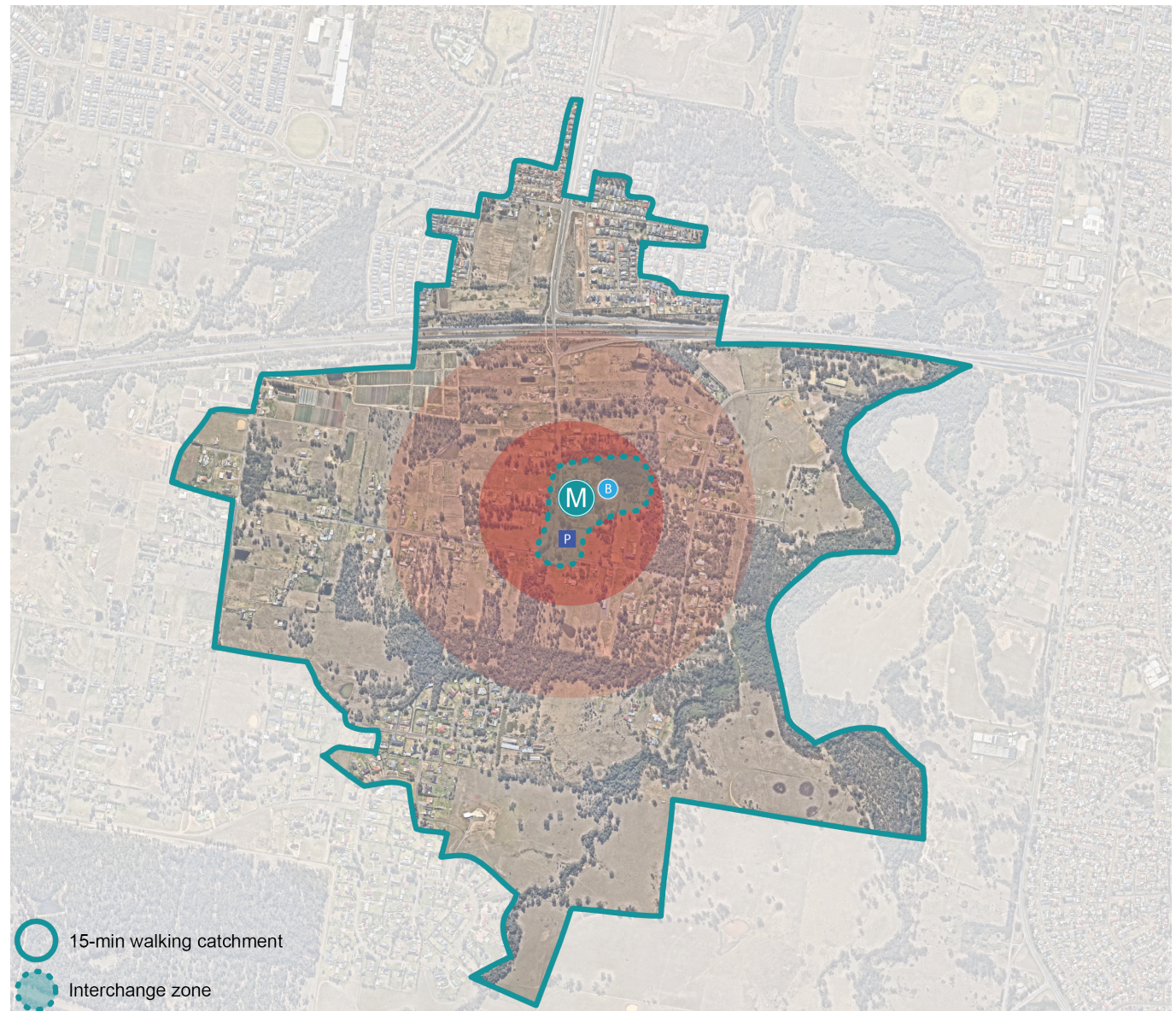
Orchard Hills will be well-connected with accessible mass transit, offering opportunities for cross-regional transport connectivity. Orchard Hills will be a template for a new, sustainable approach to urbanism in Sydney, set within the blue and green grid of the Western Parkland City. The preservation of environmental character will support a sense of local identity, and generous green recreational spaces will form part of an expansive network of open space and active transport links.



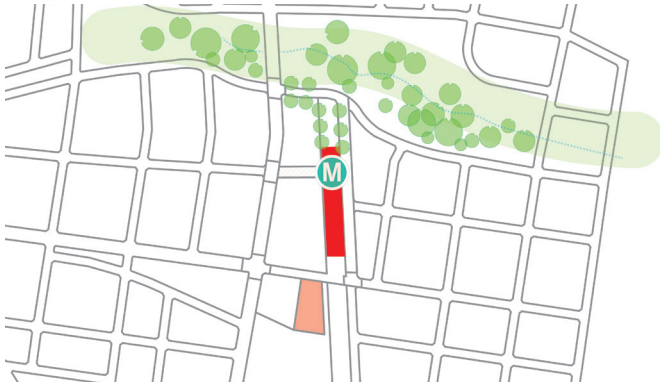


### Station and Design Drivers

- Transform the precinct by establishing a new town centre with mixed-use residential, commercial and retail development.
- Catalyse urban renewal surrounding the new town centre with a mix of diverse housing types.
- Consider opportunities to extend station catchment through transport integration establishing an interchange hub to serve catchment to the west (including Glenmore Park).



## Urban Design Strategies



### Environment and Sustainability

- Station, interchange and plaza design should reflect and provide visual and physical integration into adjoining and nearby areas of riparian zones and open spaces.
- Plant trees along precinct roads and around the station environment to soften the landscape, provide shade and reduce urban heat island effects.



### Interface, Activity and Place Making

- Precinct design will achieve an integrated urban outcome.
- Interfaces with rail corridor should be designed to minimise visual impacts and mitigate acoustic impacts of rail infrastructure.
- Metro-led development at St Marys will include active building frontages and a high quality public domain that contributes to a safe and permeable station precinct.



### Connectivity

- Ensure north-south and east-west connections are provided to connect all modes of public transport, and ensure a permeable network for pedestrians.
- Provide a generous unpaid cross corridor connection at the station entry.
- Station interface with plazas and key pedestrian links should provide activity, a variety of uses and visual richness.



## 2.3 Luddenham Road

<b>Centre type</b>	Employment and mixed use hub
<b>Station function</b>	Destination & Origin
<b>Local Government Area</b>	Penrith City
<b>Precinct vision</b>	<i>A high-amenity, mixed-use community offering a diversity of housing, with a focus on employment and industry.</i>

Luddenham Road 15-minute walking catchment



### Context

The proposed metro station for Luddenham Road will be located close to Luddenham Road. The 15-minute walking catchment extends north to the Warragamba Pipeline and stretches south towards Elizabeth Drive.

A metro station in this location will provide connectivity to an area previously unserved by rail. This location currently contains large-lot rural residential properties.

The walking catchment currently encompasses no major attractors, as it generally serves a large-lot rural living dormitory function.

Forming the key part of the high-technology Western Economic Corridor, Luddenham Road will be a knowledge-based employment hub focused on health, education and research (Sydney Science Park). The catchment will feature key proximity and connectivity to Western Sydney International and the Aerotropolis. A mixed urban form will support a local residential population with access to jobs, transport and green space.

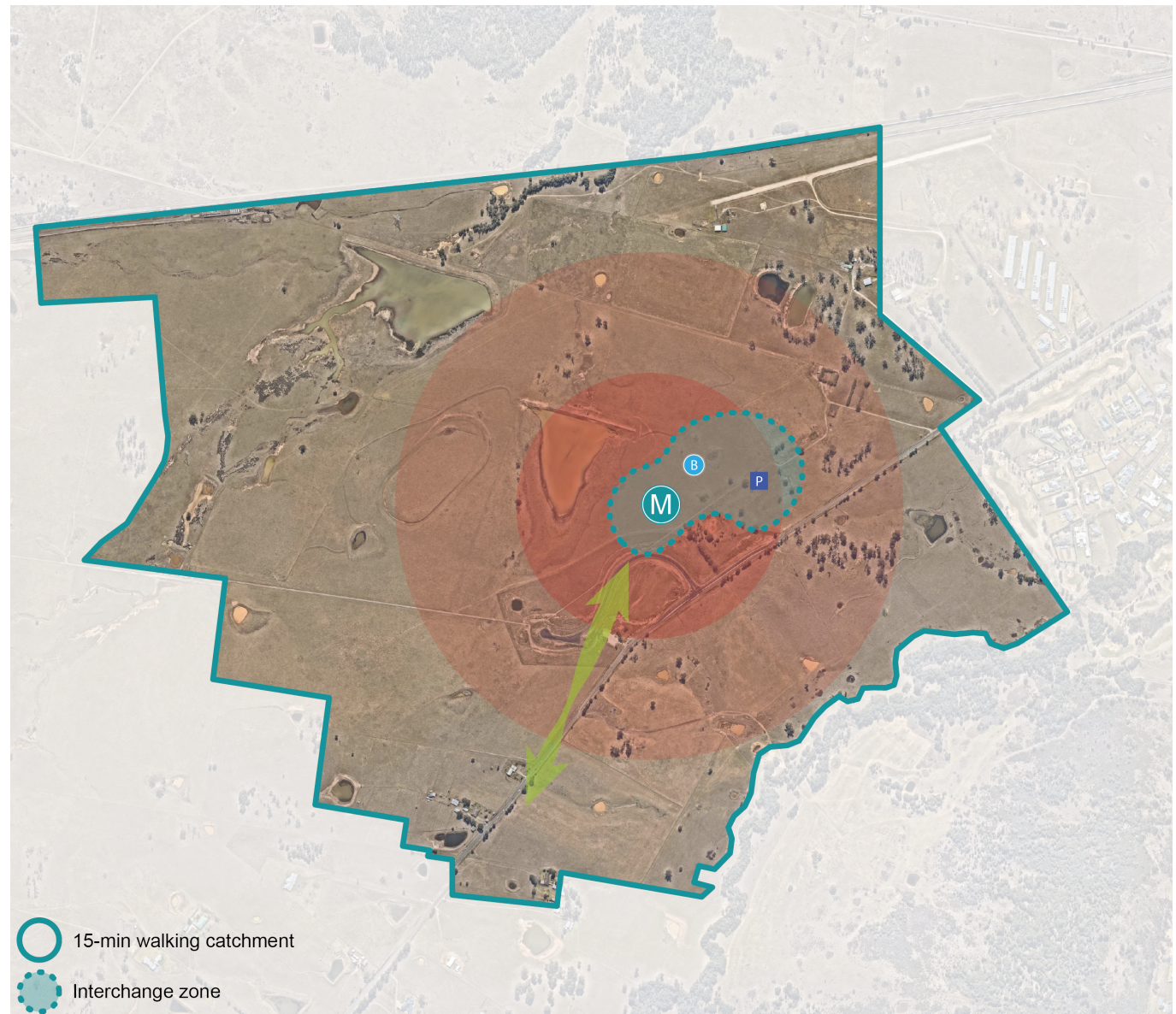
A metro station will deliver a walkable and connected mixed-use urban centre around the station, providing a range of local services in a way that makes it convenient and attractive for residents and workers to walk, cycle or use public transport for the majority of trips.





### Station and Design Drivers

- Serve and support Western Parkland City Northern Gateway precinct focused on education, high technology and research and development.
- Ensure station design responds to the intended urban structure for Science Park.

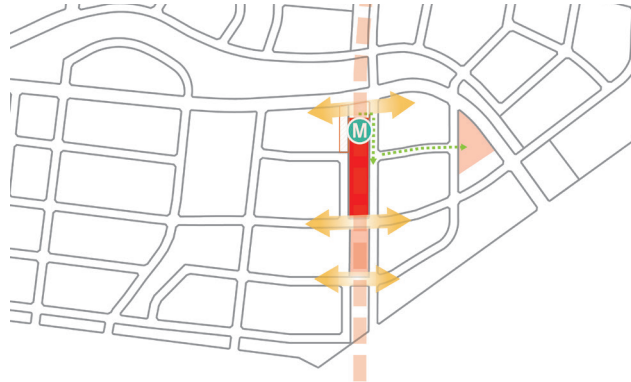


### Urban Design Strategies



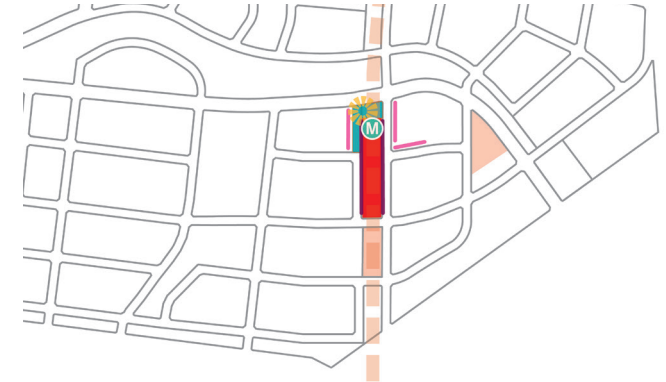
#### Environment and Sustainability

- Station, interchange and plaza design should reflect and provide visual and physical integration into adjoining and nearby areas of riparian zones and open spaces.
- Plant trees along precinct roads and within the station environment to soften the landscape, provide shade and reduce urban heat island effects.



#### Connectivity

- Ensure visual and physical linkages to east and west of the station and mitigate impacts of viaduct through design.
- Design of station and surrounds should include provision for active transport link under or adjacent to viaduct.



#### Interface, Activity and Place Making

- Landscape design to take advantage of spatial opportunities beneath and adjacent to viaduct.
- Station interface with plazas and key pedestrian links should provide activity, variety of uses and visual richness.
- Station and interchange design should be seamlessly integrated into new urban precinct.
- Any Metro-led development at Luddenham Road (subject to separate planning approvals) will include active building frontages and a high quality public domain that contributes to a safe and permeable station precinct.



## 2.4 Western Sydney International Airport Business Park and Airport Terminal

### Airport Business Park

<b>Centre type</b>	Airport-supporting business park
<b>Station function</b>	Destination, origin & interchange
<b>Local Government Area</b>	Liverpool LGA (Commonwealth)
<b>Precinct vision</b>	
<i>The Airport Business Park Station precinct will be a major employment precinct and services hub within the Western Economic Corridor.</i>	

The proposed Metro stations are located within the Western Sydney International (Nancy-Bird Walton) Airport site. The site extends east to the Badgerys Creek corridor and north to the airport site boundary at Elizabeth Drive.

### Context

The precinct is anticipated to change significantly with the delivery of Western Sydney International (Nancy-Bird Walton) Airport, supporting road network and development.

The Sydney Metro - Western Sydney Airport line will connect the business park to the airport terminal and the wider Parkland City, including the Aerotropolis, as well being linked to regional bus services.

The business park will be well connected as part of the Western Sydney International site, and its mix of commercial and industrial employment uses will service the international airport. The Western Sydney International Business Park is planned to be a walkable and high-amenity place to work, with excellent public and active transport connectivity and access.

Western Sydney Airport is responsible for master planning and urban development activities within the airport boundary.

### Airport Terminal

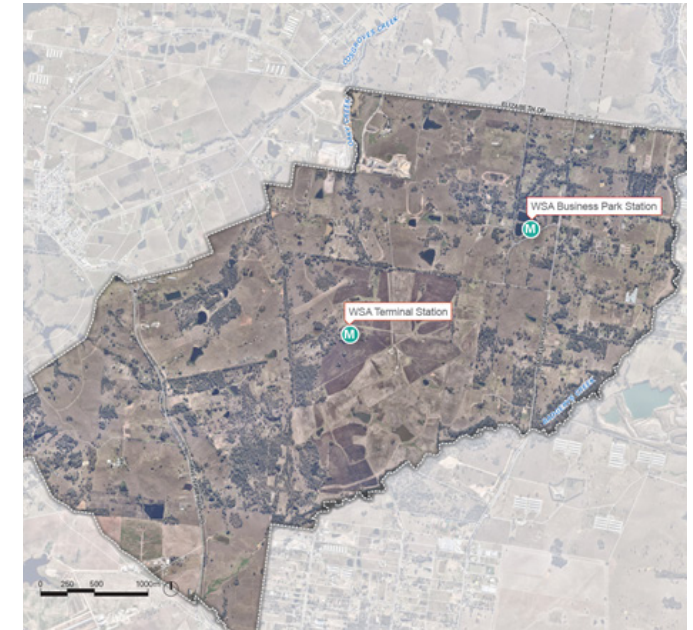
<b>Centre type</b>	Airport
<b>Station function</b>	Destination & origin
<b>Local Government Area</b>	Liverpool LGA (Commonwealth)
<b>Precinct vision</b>	
<i>The Airport Terminal Station precinct will connect workers and visitors to the international airport's passenger terminal, Western Sydney's gateway to Australia and the world.</i>	

### Context

The Airport Terminal station is located in the heart of an existing rural area. This precinct is anticipated to change significantly with the delivery of Western Sydney International (Nancy-Bird Walton) Airport, supporting road network and development.

The precinct will be high-amenity, well-integrated and focused on the passenger experience, and will have easy and convenient movement and connections between the terminal and station. The Airport Terminal Station will be a gateway to key employment and living precincts across the Western Parkland City and throughout metropolitan Sydney.

### Airport Business Park and Airport Terminal Station context



## Airport Business Park

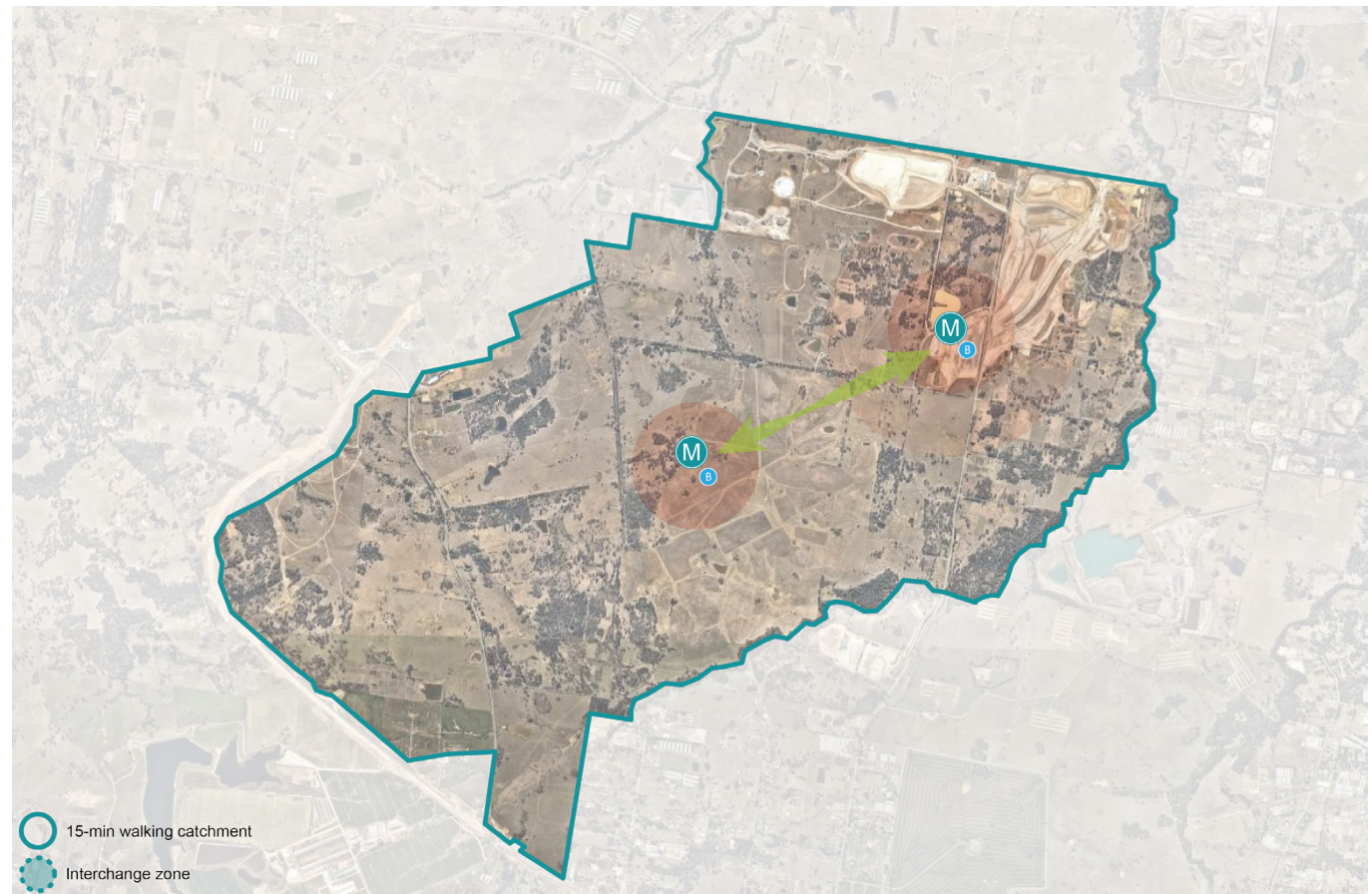
### Station and Design Drivers

- Support easy and efficient interchange with local and rapid bus services and a future east-west rail connection.
- Integrate and support the Western Sydney International (Nancy-Bird Walton) Airport master plan outcomes for the airport precinct.
- Maintain flexibility for long-term airport development.
- Provide easy, efficient and safe cross-corridor active transport access into the north and south Business Park precinct from Day One and design to accommodate future widening to create a high amenity public domain.
- Safeguard for a future rail connection from the east.

## Airport Terminal

### Station and Design Drivers

- Enable easy, efficient, safe, comfortable and intuitive customer access to the airport terminal/s for Day One of airport opening and safeguard for ultimate design.
- Integrate into and support the design outcomes for the airport.
- Maintain flexibility for long-term airport development.
- Safeguard for a future east-west rail connection.



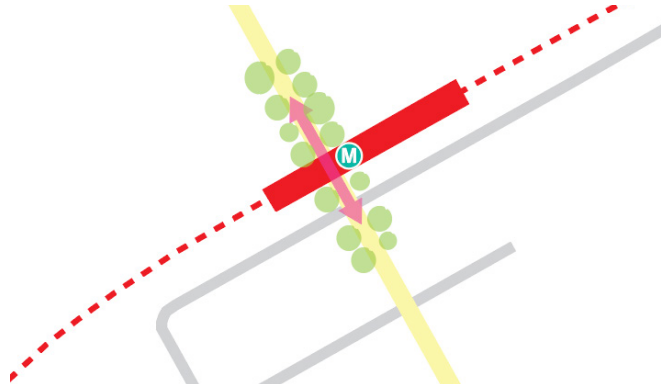
## Urban Design Strategies

### Airport Business Park



- Ensure seamless integration with pedestrian links and access points to the south
- Maximise station legibility and visual connectivity to and from the station to land beyond the transport corridor
- Utilise landscape or other elements to mitigate noise and heat impacts in and around station

### Airport Terminal



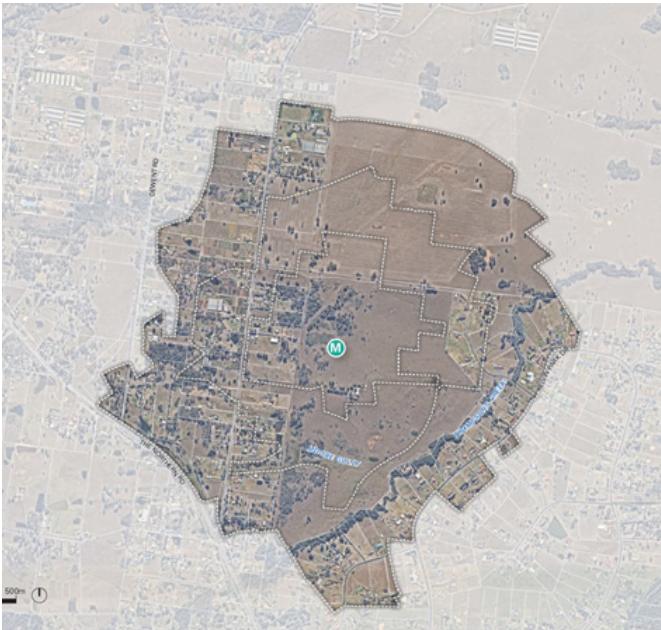
- Ensure easy and efficient integration with and connection to key pedestrian thoroughfares on both sides of station
- Ensure station is legible from terminals or the public domain
- Utilise landscape or other elements to mitigate noise and heat impacts in and around station



## 2.5 Aerotropolis Core

<b>Centre type</b>	Metropolitan cluster
<b>Station function</b>	Destination, Interchange
<b>Local Government Area</b>	Liverpool
<b>Precinct vision</b> <i>Part of the Western Parkland City's metropolitan cluster. The Aerotropolis will be the commercial heart of the Western Parkland City, with a vibrant central business district around the station.</i>	

Aerotropolis 15-minute walking catchment



### Context

The Aerotropolis Core lies directly south east of the Western Sydney International Airport. The proposed station catchment will extend to the Northern Road in the west and Thompsons Creek in the east.

A metro station in this location will provide connectivity to an area previously unserved by rail. The Aerotropolis Core catchment currently contains large-lot rural living uses, however this precinct is anticipated to change significantly and develop into an 'Aerotropolis' city typology, based on its future level of proximity and access to Western Sydney International.

The station catchment encompasses no major attractors, as it currently provides a rural and large-lot residential, dormitory function. Many of the attractors in the surrounding region are not currently accessible by rail, with some bus services and private transport meeting current needs.

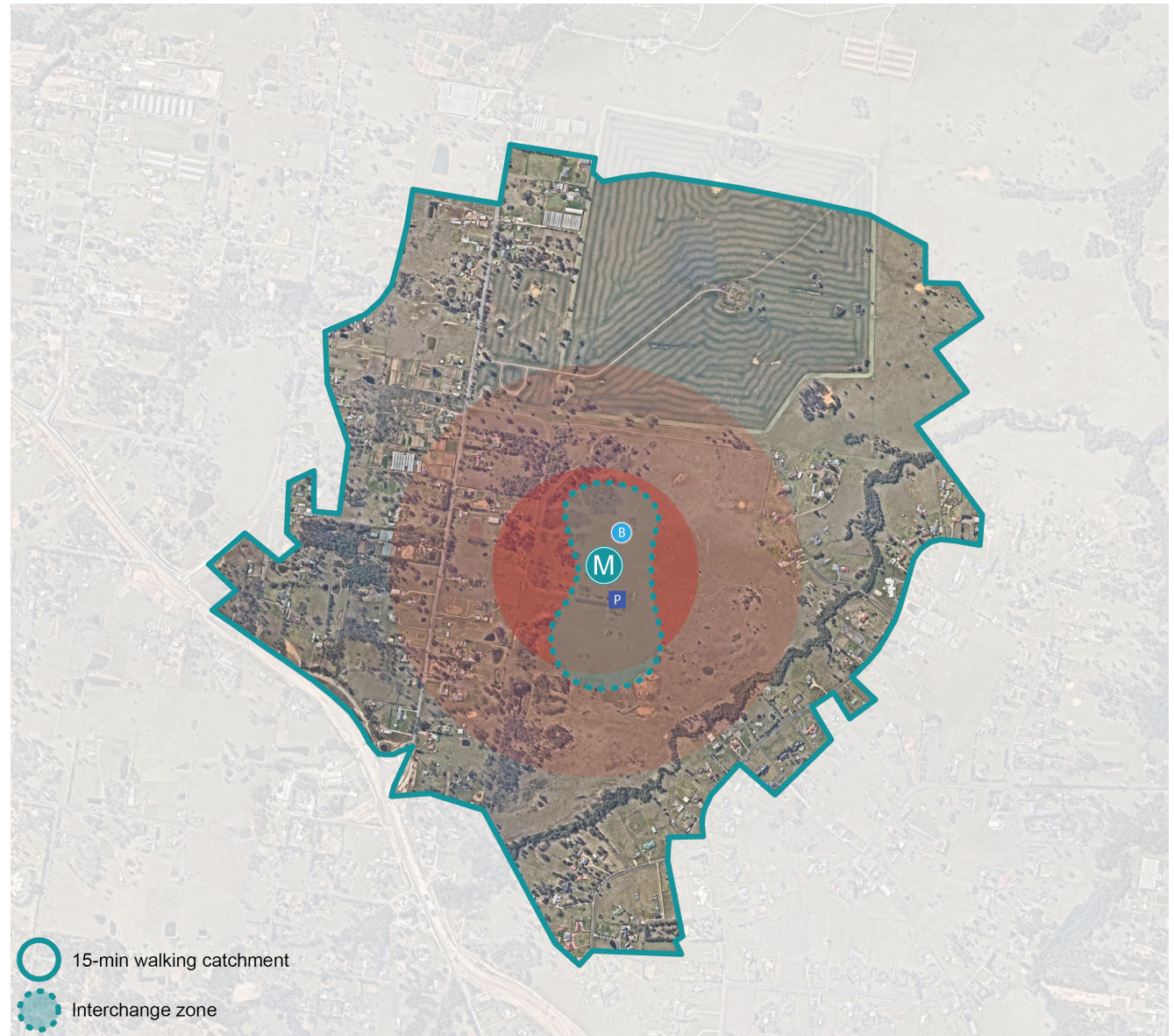
The Aerotropolis will form a major part of the Western Economic Corridor, as a knowledge-based employment hub focusing on health, education, innovation and research. A supporting local workforce will be established in a compact residential community, oriented towards the high-amenity green and blue grid. The Aerotropolis will approach urbanism in a new, sustainable way through a walkable and permeable layout that supports access to restored natural systems, open space and recreation. The precinct will have excellent metropolitan transport connectivity, while also making it convenient and attractive for residents and workers to walk, cycle or use public transport for the majority of trips.



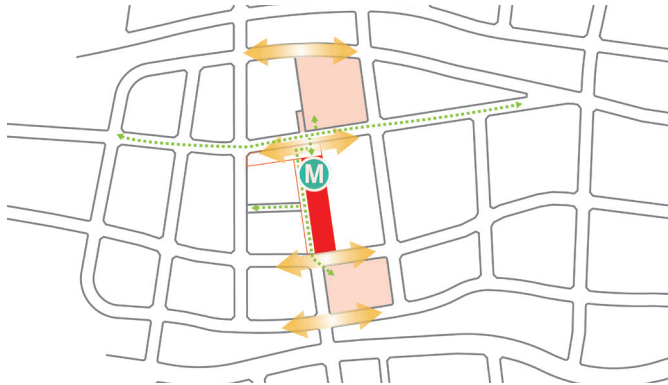


### Station and Design Drivers

- Support and catalyse a thriving CBD precinct at the heart of the Western Parkland City.
- Contribute to a high-amenity public realm within the Aerotropolis that celebrates the Western Parkland City.
- Integrate interchange functions with place outcomes to support positive experience and amenity.
- Support CBD permeability by providing active cross-corridor connections.
- Minimise severance of the CBD precinct.
- Support easy, efficient and safe interchange with future South West Rail Link extension, East-West Rail Link and rapid and local bus services.

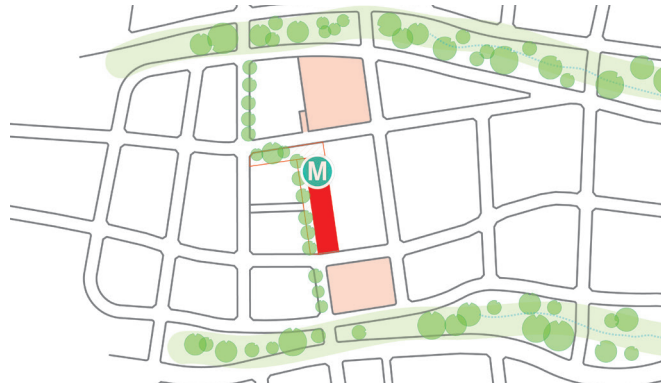


## Urban Design Strategies



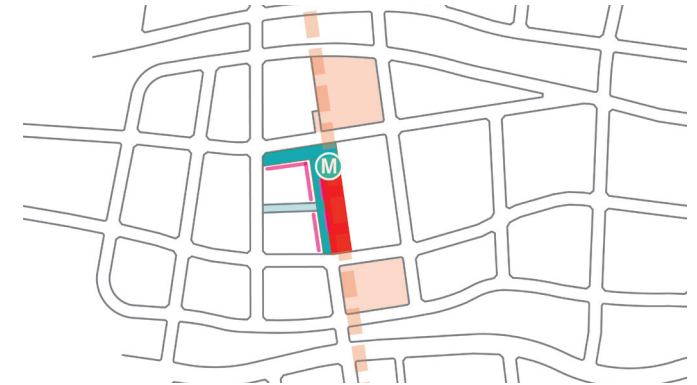
### Connectivity

- Provide convenient and quality east-west connectivity through station precinct, particularly for pedestrians and active transport modes.
- Provide easy interchange between all modes of transport including active transport connections.
- Design of station and surrounds should include provision for active transport links.



### Environment and Sustainability

- Design station, interchange and plaza areas to reflect extension of and integrate into connecting vegetation and riparian zones, and the regional open space system.
- Plant trees along precinct roads and within the station environment to soften the landscape, provide shade and reduce urban heat island effects.



### Interface, Activity and Place Making

- Development around station will provide active edges to key areas of public domain.
- Consider amenity impacts of development on the public domain, and provide a safe and permeable station precinct.
- Public plazas and other spaces should be designed to integrate into planned land use and built form structures to ensure an active, safe, and attractive station environment.



The background is a solid teal color. A diagonal band of light blue circles of various sizes runs from the bottom-left towards the top-right, creating a sense of movement and depth.

Part 3

# Function & Experience

## About this Section

This section provides guidelines for the spatial and functional design of the urban and public domain in each station precinct, as well as the urban form of associated project development. The guidelines are articulated according to a number of core design strategies that guide the planning and design of Metro stations and their precincts. The strategies are grouped under the following family headings:

- An Easy Customer Experience
- Place Making and Identity
- Connectivity

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



*Sydney Metro*

### 3.1 An Easy Customer Experience


An easy customer experience is central to all aspects of the Sydney Metro design. A high quality customer transport product across the whole 'door-to-door' customer journey is critical to the customer experience. Sydney Metro will be a fast, safe, reliable, easy service for all customers.

Sydney Metro will cater to all customers including daily commuters, people with disabilities, families, visitors to Sydney and infrequent users. Sydney Metro - Western Sydney Airport will serve airport passengers specifically and all infrastructure, from rolling stock to stations, will be designed with this in mind.

The key public transport customer service design principles which underpin customer focused design are provided below.

This part of the document provides guidelines for the following areas of the customer experience:

- Door-to-Door Journey
- Customer Circulation
- Way-finding and Legibility
- Comfort and Amenity
- Customer Safety
- Accessibility



#### Public transport customer service design principles

**Balanced:** Functional performance is balanced with customer service to achieve high levels of customer satisfaction.

**Efficient, assisted service:** A self-service system that is designed for easy, intuitive use. Where assistance may be required, support is available and easy to get.

**Universally accessible:** Meet the needs of all members of the community, accommodate the distinct needs of key customer segments.

**Flexible:** Able to adapt to a range of typical usage patterns and services while delivering a consistent level of service outcomes.

**Legible and consistent:** Reflect a service style and tone that is easily understood and consistent with the experience of an integrated transport system.

**Responsive:** A service system open to feedback from customers, that adjusts over time as needs and preferences change, and continuously improves.

### 3.1.1 Door-to-Door Journey

#### Applicable Design Objectives

- Ensuring an easy customer experience

#### Principle

*Ensure the customer experience is central to all aspects of Sydney Metro design by:*

- *Responding to customer experience drivers*
- *Ensuring adequate space to meet peak and longer-term demands*
- *Providing a comfortable and safe environment.*

#### Guidelines

- Station designs should be developed in direct response to customer segments and user requirements. Customer journeys should be understood to appreciate their various requirements for their door-to-door journey.
- All aspects of design are to address the nine Public Transport Customer Experience Drivers - Timeliness, Convenience, Safety and Security, Comfort, Accessibility, Information, Ticketing, Cleanliness and Customer Service. All aspects of design should ensure an easy customer experience.
- The design of all elements of Sydney Metro is to cater for the diversity of customers including daily commuters and airport travelers. Customers will be more likely to travel in family groups and will have luggage, restricting their mobility. Sydney Metro - Western Sydney Airport Metro will need to design for infrequent users, first timers, tourists and non-English speakers.
- Facilities within stations and precincts are to be grouped and integrated to minimise clutter, promote quality design and provide a consistent and easy customer experience.
- The design should provide calm, simple and uncluttered platforms and concourses to emphasise a safe, welcoming customer environment.
- A high level of connectivity to the public domain, passive surveillance and activation to station entries should be provided.
- Minimising decisions and level changes supports an easy journey for fatigued or stressed airport customers. Careful consideration should be given to placement and function of lifts and escalators.



## ORIGIN

Real time information, such as seat availability and lift status

## FIRST MILE

Key pedestrian access routes to each station support active travel.

Customers that use buses or on demand public transport for their first or last mile will benefit from co-located services where changing mode is easy.

## TRANSFER

All stations have accessible gradients to facilitate equal independent access. Station entrance plazas provide generous safe pedestrian zones and are sheltered from the weather so customers can get to their destination comfortably.

A standard carry-on piece of luggage can be placed underneath the metro train seats. Multi-purpose areas for strollers, luggage and bicycles are also available.

Level access between the platform and train assist smooth boarding without assistance. Platform screen doors keep people and objects safely away from the edge of the platform.

## DESTINATION

Escalators, multiple lifts on platforms and wider gates at Airport Terminal Station help customers with strollers, luggage or mobility scooters to exit the station easily.



### 3.1.2 Customer Circulation

#### Applicable Design Objectives

- Ensuring an easy customer experience

#### Principle

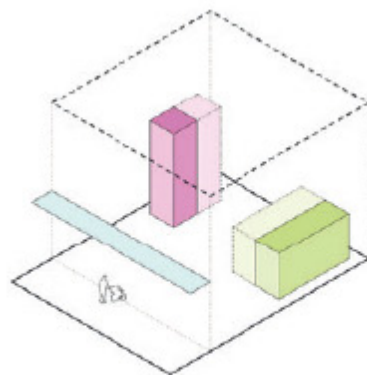
*Provide adequate space to meet customer demands, both during peak periods and for long-term patronage demands.*

#### Guidelines

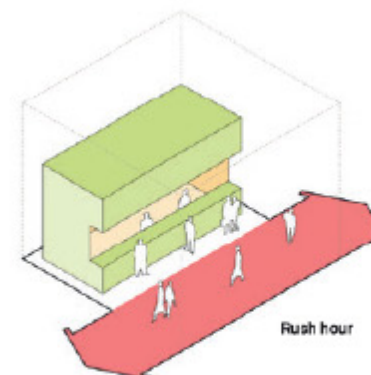
- Each part supports a different range of functions that must be addressed on station opening and in future scenarios.
- The movement capacity, configuration and spatial sequences of each of the Sydney Metro stations is to respond to patronage requirements as defined by a Level of Service (LOS) appropriate to the location and context.
- Pedestrian paths, crossings and spaces adjacent to Sydney Metro stations are to have sufficient capacity to meet potential demand with particular consideration of key decision points (gate lines, entrances, exits, customer queue zones) and information points. Where constrained, this may be met by extending the public domain into the station forecourt.
- The customer circulation paths within the station are to optimise timeliness for customers moving between concourse, platform, and station entries.
- Circulation paths are to be designed for convenience of connections into the station and from surrounding areas and other transport modes. These should reflect pedestrian desire lines as much as possible to enhance the convenience of circulation routes.
- Ancillary development and activities (retail, commercial or residential development, services areas and advertising structures) within Sydney Metro station sites are not to compromise efficient transport operations.
- All areas are to provide sufficient space for emergency access and movements in accordance with relevant design standards and legislation.
- Spatial envelopes of customers with luggage should be considered at stations that act as an interchange for the airport.



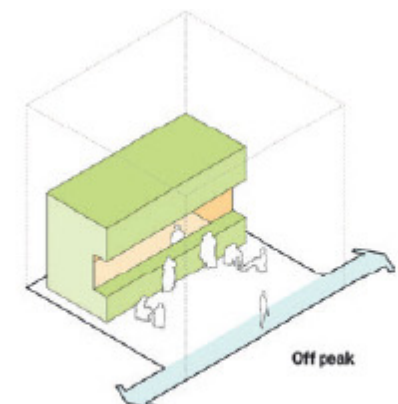
Station elements located to optimise permeability.



The effective space around each element can vary with the changing customer circulation requirements throughout the day.



Station design and capacity is to respond to primary customer flows and circulation during peak and off peak times.





### 3.1.3 Way-finding and Legibility

#### Applicable Design Objectives

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

#### Principles

*Provide intuitive, clear and consistent information and signage as well as legible, intuitive spaces to enhance customer journeys through efficient navigation and interchange.*

*Wayfinding is to create a seamless and intuitive customer journey from origin to final destination to support an easy customer experience.*

*Signage and wayfinding shall be tailored to cater specifically to airport passengers, noting that many customers will be first time users of the system.*

#### Guidelines

- Planning for way-finding and legibility will support all customers to travel independently and easily on Sydney Metro. This is done by:
  - Anticipating the needs of customers
  - Providing the accurate information at the right time
  - Planning and creating predictable and intuitive environments
  - Applying consistent system of signs and information.
- Spaces are to be visually simple and intuitive to negotiate, to contribute to an easy customer experience. This is done by:
  - Providing visibility between station levels where possible
  - Using intuitive design to minimise way-finding choices and the need for signage
  - Providing safe, legible, efficient, convenient, obstruction free, level, direct and attractive routes for customer access.
- Way-finding signage and information is to be provided in accordance with the Transport for NSW guidelines. Ensure consistency with Transport for NSW signage.
- Customers are to be provided with way-finding and information when they are:
  - Interchanging between services or modes
  - Connecting to and from public transport by walking, cycling, catching a taxi, being dropped off or picked up in private vehicle or parking in their car.



Town Hall Station. Wayfinding signage enables easy navigation and interchange.  
Source: TfNSW



Macquarie Park Station design provides a high level of visibility between concourse and platform level to aid wayfinding and legibility.  
Architect: Hassell  
Source: TfNSW

### 3.1.4 Comfort and Amenity

#### Applicable Design Objectives

- 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 usable 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, plantings\* and shade trees.

\* Plantings are subject to WSA's Airport Protection Requirements.



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

#### Applicable Design Objectives

- 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.*



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

#### 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.
- Interface with airport security systems will need to be considered at Western Sydney International Airport stations.
- Vandal-resistant fittings and fixtures are to be used throughout.
- Patronage will be lower in the initial life cycle of Sydney Metro - Western Sydney Airport stations. Scale of design needs to ensure that customers feel safe even when there are less people activating the transport hubs.

##### Public Domain

- An initial CPTED review of station precincts is to assess activity generators, edge effects, movement predictors, conflicting user groups, crime hot spots, 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.

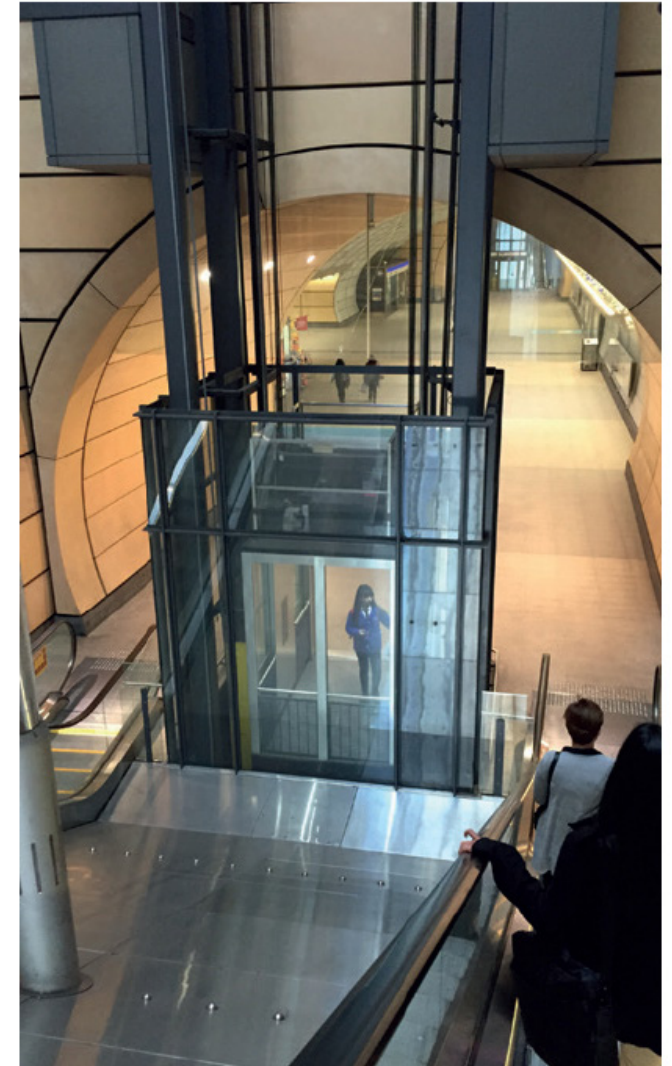


## Stations

- The station design is to incorporate CPTED strategies:
  - Eliminating hidden spaces, recesses or voids that could provide a person with the ability to conceal themselves 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

#### Applicable Design Objectives

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

#### Principle

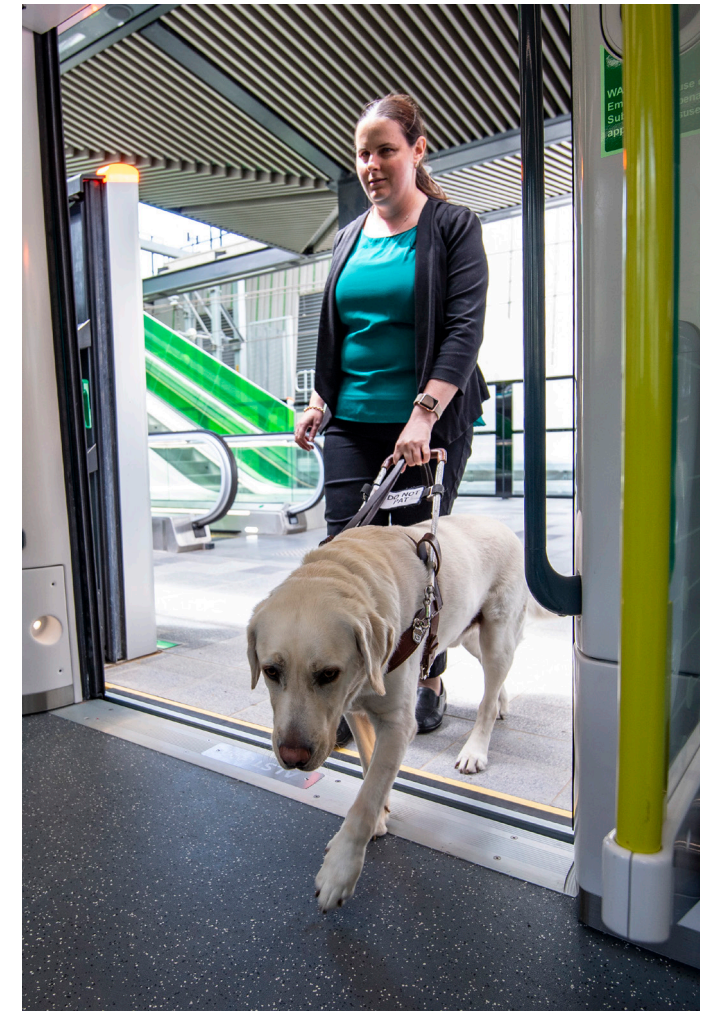
*Ensure the stations and associated spaces are safe, efficient, universally accessible, legible and easy for customers and pedestrians, including those with luggage.*

#### 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.



Sydney Metro



## 3.2 Place Making and 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.

The design of the project will seek to strike a balance between incorporating unifying design themes and elements to establish brand and product consistency, and responding appropriately and creatively to existing or envisaged urban contexts to provide unique and place-specific experiences.

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

- Network and Station Legibility
- Place Making
- Culture and Character
- Heritage & Archaeology
- Environment & Sustainability
- Art
- Lighting
- Integrated and Precinct Development





### 3.2.1 Network and Station Legibility

#### Applicable Design Objectives

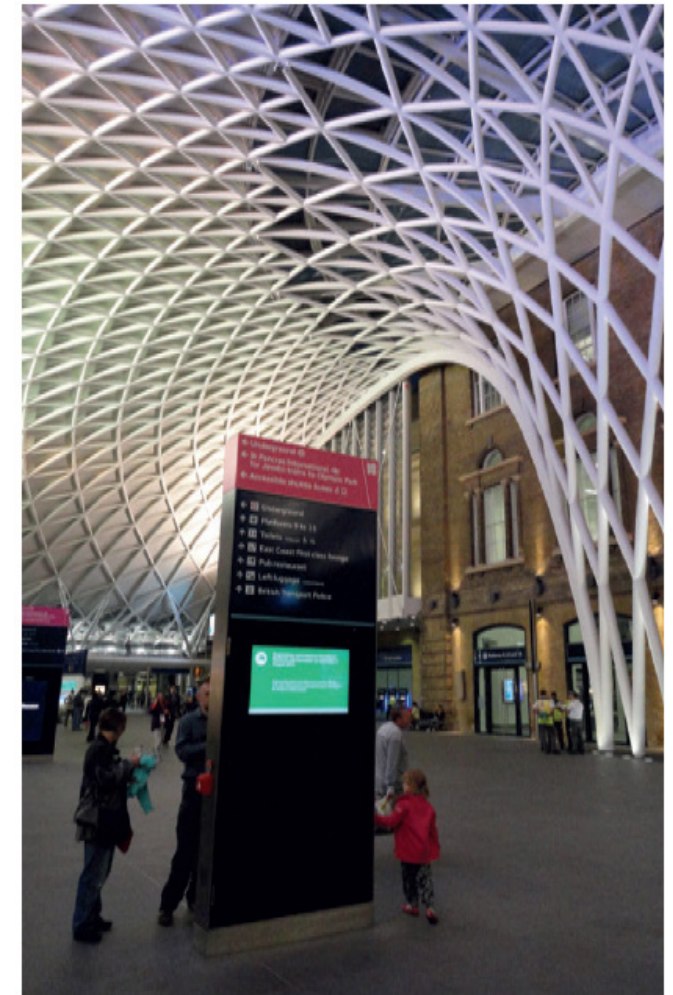
- Ensuring an easy customer experience
- Being part of a fully integrated transport system
- Being responsive to distinct contexts and communities

#### Principle

*Create a line-wide identity for the Sydney Metro - Western Sydney Airport 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, at grade, viaduct).
- 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.
- Station should be identifiable when viewed from the train so as to support way-finding.
- Design should anticipate the needs of travellers and first time users of the system.



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

#### Applicable Design Objectives

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

#### Principle

*Create welcoming, safe and well maintained public domain spaces and station buildings which foster activity and a 'sense of place'.*



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

#### 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 both an extension of the internal station environment providing shelter, comfort, safety and security for customers, and a reflection of the local public realm context and character. Materials and elements should help achieve a seamless transition through these spaces.
- Water features provide opportunities for human interactivity, and facilitate integration of stations and interchanges into the blue green grid of the Western Parkland City. Design of public spaces should incorporate water wherever possible.
- Besides serving all movement and connective functions, station spaces can be further improved through the introduction of a range of uses, services and facilities such as retail, food and beverage, shade trees, landscaping and public art.
- Create public spaces that allow for spontaneous uses and activities by their occupants.
- Provide opportunities for informal recreation, considering how people of all age groups may use public spaces.
- Provide opportunities for temporary events, 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 way-finding.
- Use lighting to generate interest and activity at night times.
- A positive precinct image is to be developed around the particular heritage values of a place or build on the qualities of the existing urban context.
- Design of public spaces should embody a sense of discovery and invite users to dwell and interact in the space.
- Water features, landscaping and lighting, etc. at Airport stations will need to consider WSA's Airport Protection Requirements.

### 3.2.3 Culture, Place and Character

#### Applicable Design Objectives

- Being responsive to distinct contexts and communities
- Delivering an enduring and sustainable legacy for Sydney

#### Principle

*Respond sensitively in the design of stations, precincts, the corridor and other project facilities to the environmental/ physical and/or social/cultural context of the project. Seek to express in the design themes or forms that speak meaningfully to the diverse and evolving nature of the region.*

#### Guidelines

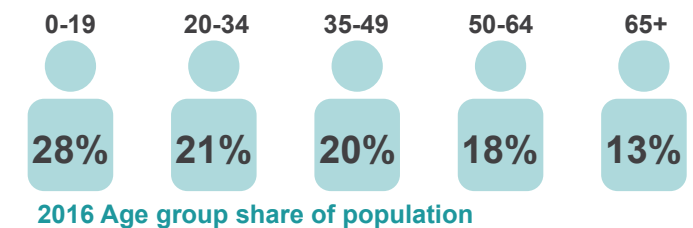
- Integrate Aboriginal cultural values in various aspects of design including landscape, project form, elements, interpretation as well as art works.
- Diverse and multicultural communities are a strength of Western Sydney. Design should therefore reflect and contribute to the multi-cultural nature of the Western Sydney region.
- Build and reinforce a meaningful connection between the stations and the communities they serve.
- Create equitable public spaces that all members of the community can access and contribute to.
- Consider relationship between stations and the blue & green grid in shaping and reflecting culture and character of places.

## Western Parkland City

 **1,070,000**  
2016 Population

 **43% INCREASE**  
Percentage population change 2016-2036

**25,893**  
Aboriginal and Torres Strait Islander population



Source: Cultural Infrastructure Plan 2025+



### 3.2.4 Heritage and Archaeology

#### Applicable Design Objectives

- Ensuring an easy customer experience
- Being a catalyst for positive change
- Being responsive to distinct contexts and communities
- Delivering an enduring and sustainable legacy for Sydney

#### Principle

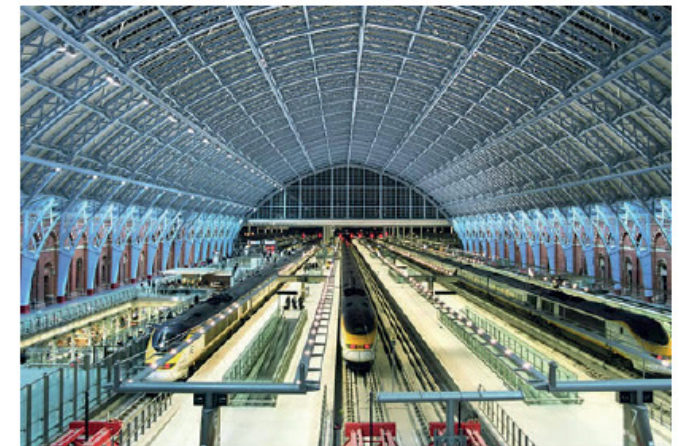
*Ensure elements and items of heritage significance are appropriately managed, respected, opportunities prioritised for heritage values to contribute to the celebration of local identity and place.*

#### Guidelines

- Sydney Metro is to demonstrate sensitivity to the heritage context, including built and natural heritage, Aboriginal and non-Aboriginal archaeology, and ensure an integrated approach is maintained.
  - Where Sydney Metro intercedes or interfaces with heritage places (such as St Marys or over tributaries), design excellence is to be implemented 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 research, site investigations, salvage and culturally appropriate safekeeping of Aboriginal 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 to define and promote local identity



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



### 3.2.5 Environment and Sustainability

#### Applicable Design Objectives

- Ensuring an easy customer experience
- Being a catalyst for positive change
- Being responsive to distinct contexts and communities
- 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, provide environmental improvements and drive beneficial social outcomes for customers and local communities.*



Central Park, Sydney. Landscaped facade treatment helps cool the microclimate.

Architect: Jean Nouvel  
Source: Cox Richardson

#### Guidelines

- Achieve a high level of performance using sustainable design rating systems
- Incorporate emerging environmental and social trends, approaches and priorities key areas of concern for our community and customers into design approach
- Ensure resilience to climate change, by incorporating climate change adaptation measures which respond to weather extremes, including flood risk, and temperature increases.
- Reduce carbon emissions through adopting low carbon design solutions and construction methodology
- Ensure renewables energy solutions are delivered at stations, stabling facility, car parks, and in the public domain where feasible
- Prioritise energy efficiency, including for lighting and vertical transport solutions
- Prioritise reuse of materials, use of recycled materials, and selection of materials from sustainable sources, including engineered timber for structural and non-structural form
- Optimise opportunities for rainwater capture and reuse
- Optimise opportunities for beneficial reuse of spoil in landscape features and other uses on the Project
- Minimise waste through efficient design and material selections, and availability was waste collection avenues
- Provide opportunities for local businesses, social enterprises and Aboriginal businesses to engage with the construction and operational supply chains
- Provide a positive journey experience in station precincts by protecting users from the negative impacts of extreme weather
- Provide noise control measures (where required) to ensure appropriate and comfortable acoustic conditions for users.
- Ensure designs respond to the local micro-climate and incorporate opportunities to reduce heat island effects, including (as appropriate) light coloured finishes, roofs and pavements
- Incorporate passive design solutions
- 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 environmental impact through design and promote ecological function
- Provide and promote green infrastructure that is climate resilience in the form of green walls or roofs, plantings/ landscaping
- Contribute to green and blue grids legacy, and enhance tree canopy cover
- Sustainability elements at Airport stations will need to consider WSA's Airport Protection Requirements.

### 3.2.6 Art

#### Applicable Design Objectives

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

#### Principle

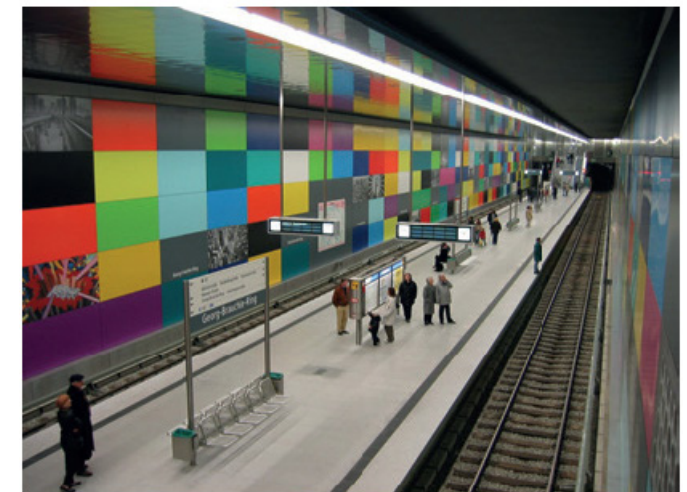
*Ensure public art is integrated within stations, plazas and corridors to elevate customer experience, enhance place-making, and help integrate the station with in the local area.*

#### 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, way-finding, 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.
- 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.
- Where appropriate, 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 way-finding, information and other customer amenities.
- The Line's Public Art Approach and Public Art Procurement process are described in the Sydney Metro Public Art Master plan - Permanent Works.
- Public Art within the station and plaza area may include any or all of the following; these guidelines apply to A,B, and C.
  - A. New permanent public art commissioned by Sydney Metro and built as part of the station works.
  - B. Permanent, pre-existing artworks which were removed from the site and are reinstated
  - C. Heritage Interpretation undertaken by Artist(s)
  - D. Public art initiated by the Sydney Metro Operator and which may be less permanent, and
  - E. Public Art commissioned as part of the related over station development and commissioned by the development owner .
- Public art at Airport stations will need to consider WSA's Airport Protection Requirements.



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

### 3.2.7 Lighting

#### Applicable Design Objectives

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

#### Principle

*Ensure a coordinated station, precinct and corridor lighting design that is appropriate for the local context, addresses CPTED and operational requirements and contributes to a positive image of Sydney Metro in the locality. Lighting should enhance station architecture, contribute to the quality of public spaces as well as the corridor landscape.*



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

#### Guidelines

##### General

- Lighting design should form part of a coordinated approach to station access, way-finding and, where appropriate, public art and activation.
- Lighting design should be generally consistent, in both function and aesthetic intent, across stations.
- Public lighting should highlight station entry and approaches.
- Illumination levels should be fit for purpose, whether way-finding, reading or facial recognition, while minimising light spill.
- Efficiency in lighting design should be pursued and the number of luminaires minimised as far as possible without compromising design intent.
- Market leading energy efficient luminaires and systems must be specified.
- Glare is to be minimised through appropriate specification and location of luminaires.
- Lighting at Airport stations will need to consider WSA's Airport Protection Requirements.

##### Station Lighting

- Lighting design including placement of fittings should be integrated into and serve the station architecture.
- Station and lighting design should achieve a considered balance between natural and artificial light.
- Protection from intense summer sunlight must also be provided.

##### Public Domain Lighting

- Lighting in station precincts and at other facilities must contribute to safe, legible and comfortable environment for all staff and users.
- Public lighting should support a wide range of potential uses.
- All public areas must use a consistent, multi-function pole and associated luminaire.
- Lighting elements must be coordinated spatially and aesthetically with all other public domain elements and the public landscape.
- Precinct lighting must be of an appropriate scale and quality, distinct from adjacent street lighting.

### 3.2.8 Integrated and Precinct Development

#### Applicable Design Objectives

- Ensuring an easy customer experience
- Being a catalyst for positive change
- Being responsive to distinct contexts and communities
- Delivering an enduring and sustainable legacy for Sydney

#### Principle

*Integrated and Precinct Development can, where viable, contribute to an active, safe and stimulating public realm around stations.*

#### Guidelines

- Design plazas and public spaces to complement and integrate with integrated or precinct development opportunities.
- Integrated and precinct development should be designed to prioritise the activation of the public domain, particularly plazas and key pedestrian routes.
- Integrated and precinct development will consider and minimise potential negative impacts of development on public spaces, including the overshadowing of key spaces of congregation and activity.
- Plazas will be designed to facilitate active uses at the interface with integrated and precinct development. Consider the role of landscaping, level changes and outdoor dining space in activating the interface zone.



### 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, kiss and ride, and park 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 environment.

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

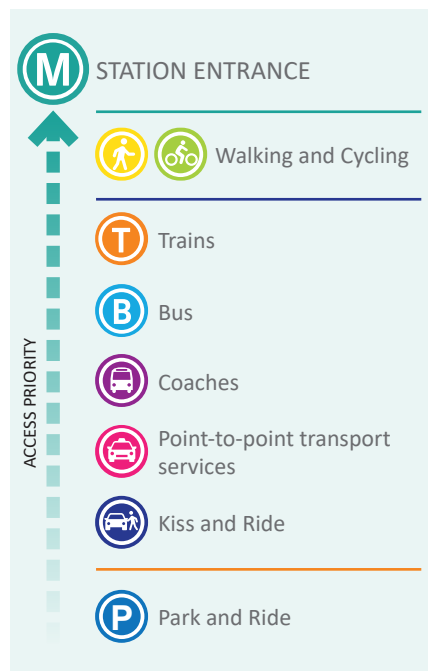
### 3.3.1 Interchange

#### Applicable Design Objectives

- Safe and customer-focused transport service
- Realising the 30-minute city

#### Principle

*Provide an easy, accessible, safe and efficient transfer experience to serve a diverse set of customers.*



Sydney Metro - Western Sydney Airport  
Station Access Hierarchy  
Source: Sydney Metro

#### Guidelines

- Station Planning and design is to acknowledge Sydney Metro - Western Sydney Airport will prioritise interchange movements from more equitable and sustainable modes, at each of their stations by applying the Sydney Metro modal access hierarchy:
  - Priority 1: Pedestrian, wheelchair and pram movement and access
  - Priority 2: Bicycle movement and access
  - Priority 3: Heavy Rail and Metro
  - Priority 4: Bus (including coach)
  - Priority 5: Point-to-Point transport services (including taxi and ride-share)
  - Priority 6: Kiss and Ride movement and access
  - Priority 7: Park and Ride movement and access
- Where feasible, providing a less than five-minute transfer between modes, aligning with Future Transport Strategy 2056 Customer outcomes. Where required, additional infrastructure to achieve safe and fast transfer between modes, such as signalised pedestrian crossings, subways and overbridges, has been identified for each station.
- Integration of interchange 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.
- Stations and interchanges are to provide a safe, welcoming, intuitive and accessible environment, supporting independent travel for customers transferring between transport modes.
- Shelter and protection from extreme weather will be provided, where applicable, to improve the experience as customers transfer or wait to transfer to the next mode.
- Interchange design 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 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 prioritised and accommodated to avoid user conflicts.
- Provide point of decision way-finding signage to facilitate walking and cycling choices.
- Station and interchange designed to adapt to future technologies, such as micro-mobility and on-demand public transport, to improve the way people work and travel.
- Station interchange areas and facilities will be designed to cater for the needs of transferring airport passengers as well as commuters and other users.

### 3.3.2 Pedestrian Movement

#### Applicable Design Objectives

- Safe And customer-focused transport service

#### 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.*

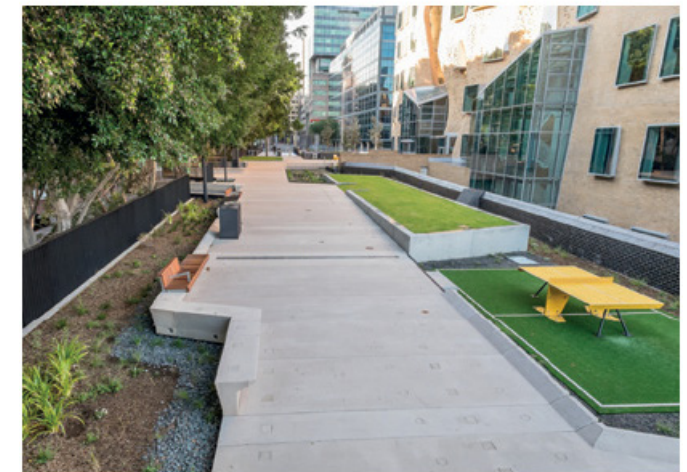
*Ensure the vertical journey is a core element of the station architecture and provides step free access between the street and the platforms as it is integral to the stations design and has a major influence on the function and visual impact of the station environment.*

#### Guidelines

- The station forecourts 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.
- Interchange precincts are to provide pedestrian routes that connect people with places they want to go and provide clear sight lines through open, uncluttered spaces along pedestrian lines between key destinations.
- Easy-to-navigate connections and legible way-finding will facilitate interchange at stations and destinations, designed for customers with strollers, wheelchairs or luggage, through the use of elevators, minimising the need for going to different floors and level footways.
- 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

#### Applicable Design Objectives

- Safe and customer-focused transport service

#### Principle

*Prioritise bicycle movement consistent with 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 align with and be connected to master plans for precincts in the Western Parklands City.
- Bicycle infrastructure is to be responsive to the specific characteristics of the station precinct, address the bicycle network and storage requirements, and integrate them into the broader precinct movement networks.
- Provide convenient and safe bicycle storage facilities with good natural surveillance and weather protection, connected to cycle ways.
- Provide infrastructure to support shared mobility schemes, allowing users to access transport modes on an as-needed basis without requiring ownership of a vehicle.
- 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.
- Conflicts between pedestrians and cyclists at stations are to be avoided through design, particularly at high activity zones such as station entries and retail areas.
- 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 for customers with mobility and vision impairment.
- Station design to enable through-access to allow for bicycles to be taken on metro trains.
- Design for bicycle facilities is to give priority to bicycle safety at road interfaces.



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

#### Applicable Design Objectives

- Safe And customer-focused transport service

#### 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.*



Sydney. Dedicated bicycle and bus lanes.  
Source: TfNSW

#### 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, and street tree planting and pedestrian amenity.
- Modifications to existing roads and development of new roads in station precincts are to consider:
  - Number of traffic lanes
  - Length and type of slip lanes
  - Intersection types and configuration signalling requirements
  - Speed environments and traffic calming measures
  - Kerbside zones
  - Cycling
  - Footpaths
  - Crossings
- Streets, footpaths, and bicycle paths are to contribute to the quality and character of urban area, and will heavily influence customer experience.
- Provide kerbside space in a flexible manner that can be reallocated according to changing access requirements. Kerbside allocation will also encourage efficient and complementary access routes for all modes, avoiding conflict and unnecessary circulation.
- Vehicular traffic planning is to be integrated with the built form and spatial planning of precincts.
- Bus stops are to be located close to the station in accordance with the modal hierarchy, to be accessed safely and efficiently by all customers.
- Design of streets adjacent to station entries that allow private vehicle and bus access are to prioritise the safe and efficient movement of the active transport network.
- Consider locker provision at stations to cater for storage of electric scooters, electric bicycles and batteries, and charging of personal electric transport.
- Taxi, ride-share and kiss and ride spaces to be located in accordance with the modal hierarchy, where safe and efficient vehicle access and high turnover is available, minimising conflicts with pedestrians, cycles, buses and other vehicles.
- Service vehicle access for all precinct functions is to be addressed as part of the broader station precinct movement strategies.
- Consider allowing adaptive use of kerbside spaces to accommodate rail replacement vehicles through design.



## Part 4

# Elements

## About this Section

This section provides guidelines for the design of elements that make up the fabric of stations and the public domain around stations. These guidelines are covered in the following three topics:

- Stations
- Public Domain
- Operations and Services

Greater detail and project specific requirements for these elements will be included in the Scope and Performance Requirements during the procurement stage.

It is noted that design of Sydney Metro stations at Western Sydney International Airport will require consideration of WSA's Airport Protection Requirements and alignment with any relevant interface deed.



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



## 4.1 Stations

Sydney Metro - Western Sydney Airport stations are part of a wider system that requires some degree of consistency in station planning, architecture and operations across lines. Although stations will be designed in response to their particular local context they will be recognisable as Metro stations. Station precincts and their interchange facilities will be well integrated with existing or emerging urban settings such that stations are central to a legible and accessible public transport system.

Station and precinct design should seek to deliver an easy, uplifting customer experience. Station entries, circulation and vertical transport zones, platforms and waiting areas must be designed to meet operational requirements and provide an easy customer experience. Stations are public buildings and their design and materiality must be of an appropriate quality. Structures and finishes must be sufficiently robust for the public and rail environment.

The design the Western Sydney Airport line stations must also consider the particular needs of airport travellers, many of whom will be first time users.

This section of the guidelines includes the following station areas and elements:

- Stations - General
- Station Entries
- Platforms
- Circulation and Vertical Transport
- Flooring and Pavement
- Walls, Ceilings and Platform Screen Doors
- Lighting



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



#### 4.1.1 Stations - General

##### Applicable Design Objectives

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

##### Principles

*Station designs are to deliver consistent station planning and operations across the different station typologies. The architecture of the stations must establish a recognisable line-wide language for all stations whilst responding to it's individual urban context.*

*Sydney Metro - Western Sydney Airport includes underground, trough and viaduct stations.*

##### Guidelines

- Station design is to be integrated with adjoining precinct design to ensure safe and efficient access to stations.
- Station design must allow for potential integration with appropriate adjacent developments or development sites.
- Station entries must be highly legible in their precinct.
- The legibility of the Airport Terminal Station, and its functional and visual relationship to the airport terminal and precinct, must be considered in design.
- Where space and other urban design considerations allow, entries and gate lines are to be located at in highly visible locations at street level.
- Entries and station concourses are to be transparent, generous and inviting spaces.
- Stations should, as far as possible, be naturally lit and ventilated.
- Station and precinct design should provide a seamless transition between transport modes.
- Key functional elements of stations and precincts should be consistent across stations.
- Operational and customer facilities are to be integrated in a consistent fashion, regardless of station typology, to ensure a consistent customer experience.
- Level changes between the street and station entries should be minimised.
- Station design must provide efficient, intuitive circulation between station entry and platforms.
- Precinct and station planning should allow for inclusion of affordable and flexible business premises, such as small scale retail, pop ups or micro-businesses.
- Design of station plazas, including any retail component, should consider and promote day and night time public use and activation.
- Permanent public art should be included in design of the station and/or precinct.

### 4.1.2 Station Entries

#### Applicable Design Objectives

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

#### Principle

*The design of station entries, their canopies and concourses, is to create a strong, consistent line-wide identity. Concourse design must provide efficient and intuitive circulation and interchange spaces.*



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

#### Guidelines

##### General

- Station canopy and entry design must consider existing or anticipated urban form, in terms of scale, character and heritage, where relevant.
- Station entries should be clearly visible in the locality.
- Design of station buildings is to avoid long, blank walls addressing the public domain. Articulation of built form and appropriate landscaping should be employed to mitigate building mass.
- Provision must be made for active street frontages wherever possible, particularly at station entries.
- Station entries must include adequate weather protection for customers at gate lines, queuing zones, amenities, ticketing and information areas.
- Entry concourses should present as simple volumes, be clutter-free and feature flush, continuous materials and clear directional signage that assist way-finding.
- Entry spaces should provide a safe, well lit, open and welcoming customer environment that has clear sight lines between the interior and exterior of the station.
- Wherever possible, vertical transport and concourse areas should be naturally lit.
- Sufficient space must be provided, separate to primary paths of travel, to meet anticipated patronage and to provide clear zones for queuing at ticket vending machines (TVMs), vertical transport and gate lines, including during special events.
- Design should seek to minimise the number of columns and avoid these and other obstacles on key sight lines and paths of travel.
- Lighting, communication, way-finding, information and security systems must be architecturally integrated, and recessed wherever possible.
- Unobtrusive maintenance access shall be allowed for in the design.
- The materials used in station entry areas should complement the adjacent public domain finishes.
- Station entries must include a well-integrated and secure means for shutting stations in non-operational hours.

##### Canopies and Awnings

- Protection from the elements at station entries and concourses should be provided by a single architectural element.
- Skylights should be included in the entry canopy, with a focus on the primary path of travel to vertical circulation zones.

### 4.1.3 Platforms

#### Applicable Design Objectives

- Ensuring an easy customer experience

#### Principle

*Platform design must maximise efficiency, provide a high level of service and an easy customer experience, especially for customers with luggage.*

#### Guidelines

- Efficient, safe access to metro services will be provided on platforms that have clear sight lines and generous, obstruction free circulation and waiting spaces.
- The location and distribution of vertical transport (lifts and escalators) is to be informed by anticipated customer demand and movement patterns.
- Platforms are to be free of any recesses that could offer hiding places, hinder CCTV coverage, become litter traps or disrupt continuous paths of travel for the visually impaired.
- Emergency egress must be provided in accordance with the Fire Life Safety requirements.
- Design of platform areas, using the architecture, materials and lighting, must have a clear relationship to the vertical circulation zone.
- Platform design should seek to minimise the number of columns and avoid these and other obstacles on key sight lines and in waiting and circulation zones.



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 Vertical Transport

##### Applicable Design Objectives

- Ensuring an easy customer experience
- 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 well-integrated in the design of station.*

##### Guidelines

- All platforms are to be served by escalators and lifts that provide efficient access from entry concourse to platforms.
- Where stairs are included as a secondary means of access, they must be easy and safe to use.
- Where stairs form the primary means of access and ramps, lifts and escalators are an alternative, this alternative path must not result in a longer journey time than the primary path.
- Where feasible provide stairs adjacent to escalators to cater for higher levels of pedestrian movement and as an alternative when escalators are undergoing maintenance.
- Integrate lifts in station design such that they are expressed as strong, architectural elements in their own right.
- Vertical circulation elements are to be made from high quality materials.



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



#### 4.1.5 Flooring and Pavement

##### Applicable Design Objectives

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

##### Principle

*Allow for the safe and efficient movement of pedestrians, including people with disabilities, through the provision of high quality, robust flooring and paving suitable for public areas and the rail environment.*

##### Guidelines

- Floor and pavement surfaces within and outside stations are to be of a consistent, high quality that reflects the Sydney Metro - Western Sydney Airport identity.
- Flooring must be durable, hard-wearing, easy to clean and slip resistant.
- Material selection is to consider sustainability factors such as dematerialisation, embodied carbon and replacement.
- Station flooring and plaza pavements are to be complement adjacent public domain finishes where these exist, or are planned.
- Station flooring must present a clean, attractive and uniform appearance and form part of a coordinated palette of station materials.
- Paving and flooring patterns or configuration should serve to indicate, if possible, the prevailing paths of travel.



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 Walls, Ceilings and Platform Screen Doors

##### Applicable Design Objectives

- Ensuring an easy customer experience
- Delivering an enduring and sustainable legacy for Sydney

##### Principle

*Wall and ceiling materials should form part of a flexible system of elements that allows for a reasonable level of standardisation of components without precluding individual expression at any or all stations.*



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

##### Guidelines

##### Walls and Ceilings

- The structure, finish and appearance and of walls must be suitable for the public, rail environment.
- Durable cladding and or finishes that are suited to local environmental conditions must be specified.
- Wall systems, components and fixing details must be fit for purpose including appropriateness for the given acoustic environment.
- Design must consider ease of access for maintenance and replacement of wall and ceiling sections or panels.
- Wall and ceilings in the rail (track) zone should be subdued and simple.
- Feature walls or ceiling planes may be used as architectural elements to identify a station and/or highlight vertical circulation and primary paths of travel.
- Use of colour or texture should generally be deployed to assist in station way-finding.
- The balance of station finishes should be relatively neutral, or recessive, relative to areas of bolder expression.
- Wall and ceiling detailing must anticipate the integration of other station elements and fixtures, such as signage, speakers and cameras, and the placement of vending machines, help-points, bins and seating.

##### Platform Screen Doors

- Platform Screen Doors (PSDs) should be as transparent as practicable, with considered structural framing designed to achieve a minimal and elegant platform edge barrier.
- Platform Screen Door design must conform to the following requirements:
  - Minimum 1700mm height
  - Run for full platform length with fixed complementary panels on inactive parts of platform
  - Well resolved integration of end walls
  - Maximised extent of glazing
  - Meet security requirements
  - Be modular to facilitate ease of fabrication, installation repair and replacement
  - Well resolved junctions with adjacent surfaces

## 4.2 Urban Realm

The design principles to govern the integration of rail infrastructure, stations and related facilities into their existing or proposed future urban settings are outlined in this section.

The urban design of station precincts should establish the setting in which stations have a civic presence and become a focus for town centre activation and a catalyst for development. The project, especially in greenfield areas, can influence the configuration of roads and access pathways to, and around, stations. Design of station plazas, interchanges, local streets and pathways will extend the footprint and identity of stations into the precinct. Consideration of the quality and amenity of these elements becomes as important as the station itself, in the early formation and development of these urban areas.



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

#### 4.2.1 Landscape Design

##### Applicable Design Objectives

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

##### Principles

*The landscape design of the project will contribute to the restoration of the natural qualities of the South Creek corridor and its development as a series of high amenity public open spaces.*

*Station precincts will include significant tree planting and well-designed public spaces that set a high standard of public amenity, consistent with whole of government aspirations for the Western Parkland City.*

*The quality of the station precinct and corridor landscape design will be an important component of the public identity of Sydney Metro in the Parkland City.*

*Landscaping of the Sydney Metro - Western Sydney Airport corridor will contribute to revegetation of the South Creek catchment and to whole of government objectives to increase Sydney's urban tree canopy and create a high level of amenity in the Western Parkland City.*

*Water quality basins designed for the retention and treatment of storm water and drainage from the rail alignment will be a considered part of an integrated landscape design.*

##### Guidelines

###### General

- Urban and landscape design should respond to existing local conditions, site history and the anticipated future character of the Parkland City, its residents and workers.
- Materials and planting selections should consider these contextual questions
- Landscape design must be functionally appropriate for an urban station environment and adequately address safety in design issues pertinent to the generic rail environment and the specific road and public realm environment of each station.
- Landscape design must result in appropriately scaled spaces and elements that provide a reasonable level of comfort to users across the seasons, with consideration of the regional and local micro-climate and any anticipated adjacent development.
- The design of plazas and associated spaces should be well-ordered and clearly legible to assist in way-finding.

###### Hard Landscape

- Paving design should aid legibility, in particular the principal paths of travel.
- The design of plazas, precincts and car parks must feature water sensitive urban design, including passive irrigation and permeable pavements.
- The design process must investigate the use of recycled materials, especially those derived from any demolition works.
- Landscape design and the choice of materials must seek to avoid slips, trips and falls.
- Materials, furniture and fixtures must be durable, high quality and contribute to a recognisably civic character for Metro stations.
- Material choice should maximise economies of scale and be designed for safe installation, low maintenance and long term durability.
- Elements and their detailing must meet all functional requirements including customer interface, and component and services integration.
- A hierarchy of paving types will be provided such that pavements are appropriate for their location and function, and include consideration of heat island effect mitigation.
- The paving palette is to be developed with reference to local Council public domain guidelines, where available.
- Paving on either side of gate line should be relatively seamless and if not the same, then clearly complementary.
- Paving must meet the required standards, design codes and specifications for visual and tactile contrast and slip resistance.



**Soft Landscape**

- Plant species must be suited to local environmental conditions and appropriate for the proposed urban or open space setting.
- Planting type, scale and configuration must be spatially appropriate for the scale of the setting and must not compromise the pedestrian capacity of circulation spaces.
- Street trees are to provide strong, legible structural planting in precincts and reinforce connections with adjacent streets or areas, contribute to visual continuity and local character.
- Depending on orientation and degree of urban enclosure, trees are to provide summer shade and good solar access in winter.
- Planting is to be low maintenance, with generally no irrigation requirements beyond the establishment phase.
- Planting design must seek to mitigate heat island effects and maximise public amenity.
- Screen planting is to be employed in the visual mitigation of engineered structures and service and ancillary buildings in the rail corridor.
- Planting design must achieve clear sight lines at road intersections, in plazas on main paths of travel and at interchange facilities.
- Planting design must observe the required offsets – clearance heights and distances – to rail infrastructure.

**Corridor**

- Landscape design in surface sections of the alignment will be based upon the appropriate Cumberland Plain Woodland vegetation communities.
- Riparian zones traversed by the alignment will be revegetated using endemic species from the appropriate vegetation community.
- Planting in viaduct sections of the alignment should mimic relatively open woodland to allow for recreational areas and activities to be included in the design.
- Landscape design will consider relevant guidelines regarding species selection to mitigate bird strike in identified areas around the Western Sydney International (Nancy-Bird Walton) Airport .

**Water Quality Basins**

- Basins will be designed to achieve these functions but also as landscape elements that contribute to local ecology and amenity.
- Generally basins will be naturalistic in shape and contoured to blend with adjacent landform.
- Basin planting will include selected indigenous grasses and sedges and appropriate trees and shrubs specified as part of the wider landscape design.

#### 4.2.2 Civic Interface

##### Applicable Design Objectives

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

##### Principles

*Contribute to an urban framework that establishes stations as focal points in town centres.*

*Develop an architectural language for stations that lends a civic quality to the stations, at an appropriate scale in relation to the anticipated urban form of precincts.*

*Station and precinct design should, where appropriate, be informed by the landscape character of the region and the needs of existing and future communities that will be serviced by the line.*

##### Guidelines

- Roads and pedestrian/cycle connections to stations that are clear, safe and attractive.
- Plazas adjacent to stations that provide a high level of public and landscape amenity.
- Architectural expression, material choices and appropriate scaling of elements to give the station a local civic presence.
- The development of architectural language or form at the Airport Terminal Station that is complementary to the terminal and precinct design.
- The design of the public landscape should also aim for a civic quality.
- Public art and cultural interpretation which explores local identity should be embedded in public domain or station design.

### 4.2.3 Plazas

#### Applicable Design Objectives

- Ensuring an easy customer experience
- Being a catalyst for positive change
- Being responsive to distinct contexts and communities
- Delivering an enduring and sustainable legacy for Sydney

#### Principles

*Appropriately scaled plazas shall integrate the station entry, street frontages, pedestrian crossing points and transport interchange facilities to achieve a coherent public domain around stations.*

*Ensure pedestrian priority across local streets is aligned with station entry/s.*

*Plaza design shall provide unhindered access across plaza to the station entrance.*

#### Guidelines

##### General

- Ground levels manipulated to allow gently graded walkways rather than stairs and ramps wherever possible.
- Design composition, furniture arrangement and finishes used to enhance legibility and way-finding.
- Weather protection at station entry and all interchange facilities.
- Architectural lighting used in plaza areas to enhance station identity.
- Shade trees and wider planting design must improve micro-climatic conditions.
- Design should include clearly defined entry points to mark a sense of arrival at station.

#### 4.2.4 Access Streets

##### Applicable Design Objectives

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

##### Principles

*Provide a local street interface with the station that is commensurate with projected function and demand.*

*Promote walking and cycling to the station through provision of shaded, comfortable and safe access streets and/or paths and cycleways.*

*Connect access streets to the existing street network.*

##### Guidelines

- Station entries aligned with street axis where possible to maximise visibility of the station.
- Setback and location of the station entrance to allow an appropriately sized public plaza.
- Minimum necessary vehicle carriageway widths (and maximum verge width) to allow for generous, landscaped approaches to stations and safe pedestrian crossings.
- Consideration of potential development sites which should be identified in precinct plans, including future access points and potential complementary urban settings to then station.



#### 4.2.5 Accessible Pathways

##### Applicable Design Objectives

- Ensuring an easy customer experience
- 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 way-finding 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.

#### 4.2.6 Furniture and Fixtures

##### Applicable Design Objectives

- Ensuring an easy customer experience
- Being a catalyst for positive change
- Being responsive to distinct contexts and communities
- Delivering an enduring and sustainable legacy for Sydney

##### Principles

Furniture and related fixtures must be designed as an integrated suite of elements that are high quality, durable and fit for purpose.

##### Guidelines

- The design of elements should achieve clear, honest expression of materials.
- Natural and recycled materials should be used where feasible, without compromising aesthetic and performance outcomes.
- The use of durable, self-finished materials is desirable.
- The design of furniture and fixtures should be complementary to station architecture.
- Site furniture and fixtures such that they do not become obstructions to pedestrian movement in station plazas and interchange areas.
- Elements can be used to delineate functional areas or spatial arrangements.
- All elements should be accessible to the full range of potential users.
- Seating can be integrated with other landscape elements as appropriate to the design.
- Seating should be located along main paths of travel, adjacent to entrances and in interchange areas at a maximum spacing between seats of 60 metres.
- Litter and recycling bins are to be co-located in appropriate locations in stations and the public domain.



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.

#### 4.2.7 Fencing

##### Applicable Design Objectives

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

##### Principles

*Corridor and station precinct fencing and gates will comprise a simple, standardised family of elements that are of high quality, durable and fit for purpose.*

*Fencing location and alignment should be considered as part of the integrated landscape and urban design of stations and corridor.*

##### Guidelines

- Fences and gates must be suitably robust and for the public and rail environment.
- Fixing details must be discreet and well resolved, not visually intrusive,
- Ease of maintenance access must be considered in design.
- Fencing should as far as possible be visually recessive, especially in the station precinct environment.
- Security fencing is to be set back from street edges to allow for a landscape buffer.
- Corridor security fencing must be efficiently integrated with other corridor structures such as bridges and retaining walls.
- Corridor access points must be designed to minimise potential conflicts between maintenance vehicles and open space users such as pedestrians and cyclists.



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



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



#### 4.2.8 Earthworks and Engineered Structures

##### Applicable Design Objectives

- Being responsive to distinct contexts and communities
- Delivering an enduring and sustainable legacy for Sydney.

##### Principles

*Visually integrate earthworks and retaining walls in the rail corridor with their urban or landscape setting, as part of a coordinated whole of corridor design.*

*Ensure safe maintenance access to corridor earthworks and structures*

##### Guidelines

##### Earthworks and Embankments

- All earthworks should sit lightly in their context, exhibiting a 'natural fit' within their landscape setting.
- Use of retaining walls is preferred on batter slopes where gradients exceed 3H:1V.
- Planted batters should generally be 4H:1V wherever space allows.
- Earthworks to be rounded out at top and bottom of batters, and at ends of
- Formations, in order to achieve a 'natural' transition to adjacent landform.
- Where these requirements cannot be met due to limited space, the use of retaining walls is preferred.

##### Retaining Walls and Portals

- Retaining walls and related elements will form part a unified composition, integrated with other components such as fencing, guard rails, lighting, landscape, drainage, and noise walls.
- Retaining walls are only to be used where there is no other alternative.
- Cut and fill batters of 3H:1V or flatter will be vegetated.
- In elevation walls will present a consistent, modular pattern of vertical and horizontal joints expressed as shadow lines.
- Vertical joints are to be coordinated with vertical joints or stanchions of related, adjacent elements.
- Concrete retaining walls will have a smooth Class 2 concrete finish.
- The use of shotcrete is only permitted where there is no other acceptable retaining wall or vegetated embankment alternative.
- Shotcrete finishes will be detailed (smooth trowelled and jointed) to mimic adjacent structures.
- Surface finish of shotcrete will be consistent off-white or grey (according to specified and approved colour prototype) with no obvious patches or stains due to curing agents or the like.

##### Noise Walls

- 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 height of noise walls will be sufficient only to satisfy noise and vibration mitigation requirements.

- Walls are to have long, even curvatures and run parallel with the rail track.
- The ground plane below noise walls should be as even and horizontal as possible.
- Rectilinear, modular walls are to be used for consistency of appearance.
- Ends of noise barriers will be terminated with a curved or raked wall section to allow integration with adjacent structures or landform, or alternatively terminate by over lapping with adjacent structures in a planned and considered way.
- Where steps in noise walls are necessary due to landform, they should present with a consistent and legible rhythm.
- Vertical post supports shall not be visible from the track side unless designed as a specific visual effect.
- Panels shall be made from robust, vandal resistant materials, with recycled materials prioritised.
- Coating systems and applied colours must be readily available, easily and exactly matched throughout the life of the wall.
- Colours selection must consider rail restrictions and not conflict with rail signal visibility.
- The apparent scale and visual impact of noise walls will be mitigated with suitable planting.
- A minimum 1.5m clearance will be provided from the outside of noise walls to any planting to enable inspection and maintenance access.



#### 4.2.9 Viaducts and Bridges

##### Applicable Design Objectives

- Being responsive to distinct contexts and communities
- Delivering an enduring and sustainable legacy for Sydney.

##### Principles

*Visually integrate the viaducts and bridges of the rail corridor with their urban or landscape setting, as part of a whole of corridor design.*

*The viaduct should be an elegant, consistent structure that is proportionally well-resolved with a clear relationship between elements.*

*Create a viaduct that is visually light, and one that allows for active uses below and adjacent to the structure.*

*Safe maintenance access to viaducts and bridges must form part of the design.*



Viaduct piers, Sydney Metro Northwest. Sydney Metro

##### Guidelines

##### Bridges and Viaducts

- The design, form, materials and finishes of bridges and viaducts are to be consistent across the project to ensure visual continuity, unless particular bridges at certain locations require distinct structural or architectural solutions.
- Viaducts and bridges must integrate structural and architectural elements to create high quality, simple and elegant pieces of infrastructure. They must present as coherent, well-proportioned, symmetrical structures.
- The design must present smooth clean lines without unnecessary visual clutter and achieve visual slenderness through rational form and engineering.
- The viaduct must adopt a single pier design without separate headstocks and achieve simply supported spans of segmental box girders.
- Where spans of the viaduct are curved, precast concrete box girders must have a continuous form.
- The viaduct must present a clear structural rhythm with consistent spans between piers.
- The pier design must be proportionally elegant, considering the varying heights of piers from adjacent ground levels to the underside of viaduct girders.
- Viaduct will include integrated parapets that provide effective noise mitigation.
- Abutments must be visually integrated with the viaduct or bridge and sit comfortably in their landscape context.
- The design and height of viaducts and their piers should maximise opportunities for under viaduct activity, and/or landscaping and connectivity.
- The platforms of elevated stations should be supported by the viaduct structure with any additional structure to be complementary in design to the primary form.
- The design of structure associated with viaduct stations should maximise natural light penetration and minimise ground level obstructions, allowing for clear sightlines and unimpeded pedestrian flow.



Skytrain bridge, Sydney Metro Northwest. Sydney Metro

#### 4.2.10 Shared User, Cycle and Pedestrian Paths

##### Applicable Design Objectives

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

##### Principles

*Shared user or cycle paths should be sympathetically integrated with their landscape setting, be safe and legible for all users.*

*A considered landscape design must form part of path design and tree planting opportunities should be maximised along the route.*

##### Guidelines

- Paths must comply with Austroads requirements for dedicated and shared bicycle paths with acceptable minimum widths:
  - Pedestrian - 2 metres
  - Cycle - 2.5 metres
  - Shared Path - 4 metres
- Paths will have adequate lighting, sign-posting and line-marking.
- Paths will include occasional rest stops at logical junctions or landscaped areas that afford shelter and views.
- Rest stops will provide shade, seating, litter bins and drinking fountains as a minimum.
- As a minimum provision, in or adjacent to the rail corridor, new paths should be shared paths (desirable width 4 metres) or, where possible, separated paths.
- Planting design must consider mandatory offsets from rail infrastructure, sight lines for path users, other CPTED considerations and the views and policies of local Councils.
- Where walking or cycling routes have to cross roads/intersections investigate dedicated crossings or other traffic management measures to create safe crossing points.
- Lighting provision should be solar powered (no reticulated supply) unless it is more practical/economical in certain areas to supplement existing street or park lighting from existing supply.
- Lighting design must minimise light spill to adjacent properties.
- Pathway bridges are to be pre-fabricated steel with

a minimum 4000mm clear width if shared between pedestrians and cyclists.

- Bridges are to have fibre reinforced plastic (FRP) decking with a kick rail on each side.
- Bridge design should minimise the structural depth of bridges and maximise under bridge clearances.

## 4.3 Operation and Services

The design of project infrastructure must be tailored to operational requirements and transport functionality over the longer term. Similarly design must anticipate system management and maintenance functions over successive generations as Sydney grows and demands on the public transport network increase.

Stations, buildings, external areas and corridor structures must be suitable for a high capacity passenger rail service that will traverse a range of urban and open space areas with a range of physical interfaces. Stations will have consistent and reliable facilities to facilitate servicing and security functions, as well as to meet the needs of both regular and occasional customers.

This section of the guidelines covers the following elements:

- Way-finding and Signage
- Ticketing Equipment and Fixtures
- Engineering and Services Integration
- Management and Maintenance
- Security
- Emergency Requirements
- Service Vehicle Access

#### 4.3.1 Way-finding and Signage

##### Applicable Design Objectives

- Ensuring an easy customer experience
- Being part of fully integrated transport system
- Being responsive to distinct contexts and communities

##### Principles

*Provide intuitive, clear and consistent information and signage to ensure efficient navigation of the system and easy interchange with other transport modes.*

*Provide a seamless customer journey from point of origin to final destination.*

##### Guidelines

- Way-finding design must comply with Transport for NSW Way-finding Planning Guide (Sydney Metro).
- Information must include but not be limited to, trip planning including real time information for all public transport modes, station and intermodal connection orientation information, station facilities and amenities and local destinations.
- A public address system will be provided that is capable of projecting clearly audible information throughout the station.
- Advertising must not compromise way-finding. Design and placement of customer information must be prioritised as follows:
  - Way-finding 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

#### Applicable Design Objectives

- Ensuring an easy customer experience
- Being part of a fully integrated system

#### Principles

*Provide integrated ticketing equipment and associated fixtures that are consistent with Sydney Trains and Sydney Metro standard equipment across the network.*

*Ticketing equipment will contribute to an efficient, high quality customer service.*

#### Guidelines

##### General

- Common ticketing equipment and fixtures include:
  - Ticket gates
  - Ticket Vending Machines (TVM) and Opal Top-up Machines
- All components must be high quality, durable and suitable for the rail environment.
- Equipment and fixtures must be highly visible and easily accessible to customers and staff.
- Elements must be easily accessed for maintenance, future repairs or replacement.

##### Ticket Gates

- Opal ticket gates are to be used in all stations.
- The number of gates will be sufficient for peak periods.
- At least one wide aisle gate will be provided at each gate line.
- Wide aisle gates must be clearly visible and located on accessible paths of travel.
- All gates at the Airport Terminal Station will be wide aisle gates.
- Adequate runoff space outside of circulations zones will be provided on both sides of gate lines.

#### Ticket Vending and Opal Top-up Machines

- TVMs and Opal Top-up Machines must be clustered together to create a clear ticket sales zone in the unpaid area at the station entrance.
- Machines must be publicly accessible, outside primary circulation areas with sufficient queuing and manoeuvring space for people using mobility aids.
- Machines should be integrated with station architecture and other elements.
- TVMs and Opal Top-up Machines must be standard proprietary items and DDA compliant.



Sydney Trains Opal Only Gates  
Source: TfNSW

### 4.3.3 Engineering and Services Integration

#### Applicable Design Objectives

- Ensuring an easy customer experience
- Being part of a fully integrated system
- Being responsive to distinct contexts and communities

#### Principle

*Rail engineering and service elements in the corridor, at stations and at ancillary facilities will be part of an integrated design that still allows for ease of maintenance.*



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

#### Guidelines

##### General

- Station structures and engineering elements will be designed holistically to achieve an integrated engineering and architectural outcome.
- The integrated design is to include all structural, civil, mechanical, electrical and rail systems elements.
- Placement and arrangement of elements for ease of operations and maintenance, including personnel access, must be a priority in the design.
- Minimise the visual impact of engineering and systems components by concealing all services.
- Dedicated service zones should be included in stations, including space proofing for future anticipated requirements.
- Architectural expression of primary structural elements of buildings or structures should be investigated in the design.

##### Service Buildings

- Service buildings must form part of the integrated design solution with station and precinct design.
- Material quality and architectural resolution should be complementary to station architecture.
- Active frontages to service facilities should be pursued as part of precinct planning.
- Service facilities in sited in urban public areas should be integrated with other functions such as ticketing and information, egress stairs, retail or community facilities, wherever possible.
- Consideration of visual, environmental and acoustic impacts of facilities must be included in the design solution.
- Design should allow for safe access to all areas of service buildings or facilities.

#### 4.3.4 Management and Maintenance

##### Applicable Design Objectives

- Being part of a fully integrated system

##### Principles

*Cost effective, adaptable, durable and easily maintained materials and assets that are fit-for-purpose for the rail environment will be designed and specified for use in the project.*

*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.

##### Guidelines

- Adopt a consistent and coordinated palette of materials, furniture and fixtures to serve a cost effective management and maintenance approach.
- Public domain elements are to comply with any relevant local authority standards to facilitate consistent future management and maintenance.
- Public domain elements are to be consistent with adjacent public finishes - if of an appropriate standard – for ease of maintenance.
- Pavements and roads must be designed to take loads of the vehicle and equipment types that will use facilities.
- All signage, street furniture and operational equipment in the public domain, for e.g. Passenger Information Displays (PIDs) and CCTV systems, must be designed to minimise vandalism and simplify cleaning.
- The placement and detailing of furniture, fixtures and equipment should consider potential impacts from birds, insects and animals on operational assets and the customer environment.
- All assets, including paving, lighting, signage and street furniture, will be a standardised, modular design as far as practical, and be readily available with readily replaceable components.
- All elements must meet the required life cycle objectives of Sydney Metro and the specification of elements must consider sustainability objectives including dematerialisation and embodied energy.
- Materials and finishes must be easily cleaned and maintained and graffiti resistant in all customer interface areas.
- Furniture, fixtures and fittings are to be robust and durable, with consideration of potential vandalism in their detailing and placement.
- Station design must accommodate maintenance access to all elements, including components that require the use of heavy or large machinery or structures for installation of equipment, regular cleaning or repairs.
- Stations and station precincts should be designed to facilitate safe access for both operational staff and customers.

### 4.3.5 Security

#### Applicable Design Objectives

- Being part of a fully integrated system

#### Principles

*Ensure adequate security for rail corridor infrastructure, station assets and for rail users.*

*Visually and physically integrate security elements as part of coordinated station, precinct and corridor design.*

#### Guidelines

- Risk assessments must form part of the design process during all phases.
- A public address system is to be provided at emergency egress points, controllable from Station Control Rooms and Operational Control Rooms.
- CCTV must be provided throughout the station.
- CCTV must be provided at all corridor access/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 maintain safe, accessible paths of travel.

#### Fencing and Gates

- Security fencing must be provided along surface (at-grade) sections of the corridor 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.
- The choice of corridor fencing must also respond to corridor context, including for example, the provision for high quality fencing in station precincts.
- Fencing types must be robust, suitable for the rail environment and consider maintenance and future replacement.
- Fencing in station precincts and public domain areas must avoid creating dead ends.



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

#### Applicable Design Objectives

- Being part of a fully integrated transport system

#### Principles

*Ensure that station precincts, rail facilities and corridors are provide with clearly identified emergency access and egress zones.*

*Design zones to avoid potential conflict between emergency, maintenance and other vehicles as well as pedestrians and cyclists.*

#### Guidelines

- 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 include:
  - Effective and clearly signposted station emergency evacuation routes and assembly areas
  - Adequate zoning and space at emergency assembly points to ensure they are clutter free and accessible at all times
  - Fire safe refuge areas with CCTV and an accessible communication system in underground stations for people who are unable to self-evacuate
  - Emergency lighting to the immediate station curtilage
  - The appropriate location of firefighting equipment, clearly identified and readily accessible
  - Provision of emergency/security electronic help points

#### Hydrant Enclosures

- Hydrant enclosures should be easily identifiable, easily accessed modular components integrated with station/ wall cladding systems.



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

#### 4.3.7 Service Vehicle Access

##### Applicable Design Objectives

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

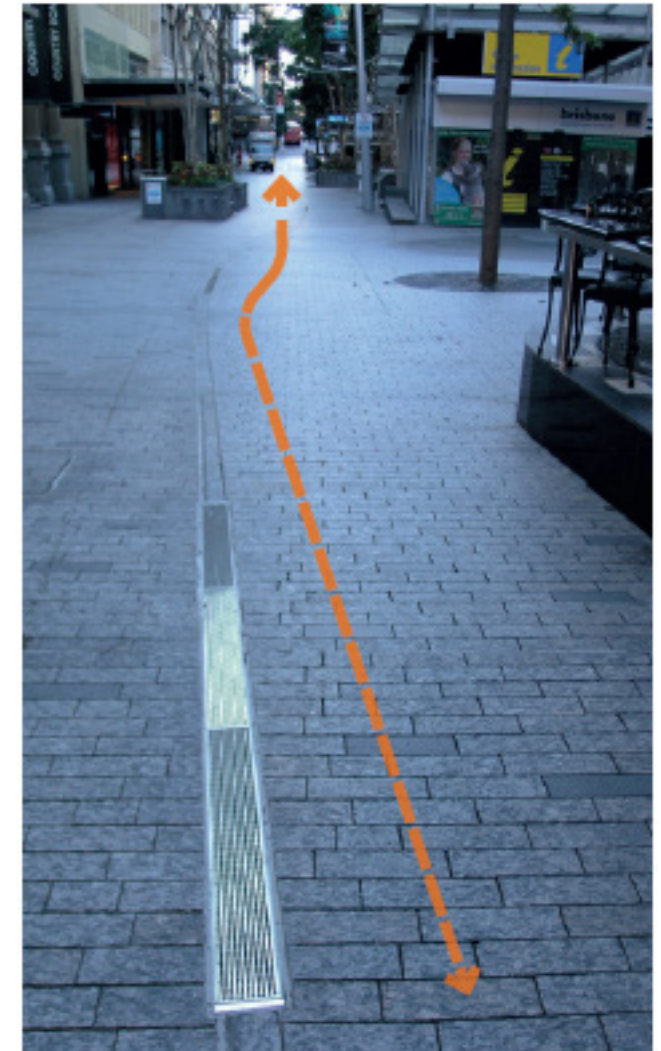
##### Principles

*The station design is to include access for service vehicles.*

*Ensure service vehicle movement paths in precincts are well defined and efficient.*

##### Guidelines

- 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 planning. This must address the project works requirements and any increased movements over the life of the project and precinct.
- 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.



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

### 4.3.8 Commuter Car Parking

#### Applicable Design Objectives

- Safe and customer-focused transport service
- Realising the 30-minute city

Sydney Metro - Western Sydney Airport is designed in part as a catalyst for changing established car-dependent travel patterns in Western Sydney. In this context, commuter car parking should only be provided where no readily accessible transport alternative exists, or is planned to exist.

#### Principles

*Parking facilities will be used to extend 30 minute station catchments without adversely affecting public transport patronage.*

*Car parking facilities should be designed with future flexibility or adaptability in mind so that structures can evolve in use if parking demand decreases.*

*Any surface car parking or parking structures must be sensitively integrated in the urban structure of station precincts. The form, scale and prominence of parking facilities should be appropriate to the anticipated urban form and well resolved architecturally and in terms of landscape design.*

*Parking structures must be secondary, in terms of visual prominence, to stations.*

#### Guidelines

- Locate car parks in line with the Transport for NSW modal hierarchy while minimising distances between parking facilities and the station.
- The location and design of facilities must consider future stages of transport network development, future development potential and potential changes in customer preferences.
- Consolidate parking areas to reduce their impact on the urban and landscape setting, and minimise any impact to active street frontages without compromising interchange facilities and precinct amenity.
- The design of car parking structures must endeavour to minimise their perceived bulk, reflecting an appropriate scale for the precinct.
- Architectural and landscape screening must be used to visually soften and integrate parking facilities with their urban/streetscape setting.
- Natural and recycled materials must be considered in the design of parking facilities and associated screening details.
- Provide safe, accessible and legible, landscaped connections between car parks and station plazas.
- Provide sufficient space at car park entries to accommodate queueing zones and future potential access gates or other entry infrastructure.
- Provide safe, well-lit entrance lobbies to parking structures.
- Surface car parks will be designed to achieve a closed tree canopy within ten years of opening to shade all parking.
- Provision for future electric vehicle charging will be included in parking facilities, including space for pad mounts.
- Priority spaces must be included for accessible parking, compact vehicles and motorcycle parking.
- Water sensitive urban design principles will be incorporated into car park design
- Opportunities for rainwater harvesting and onsite renewables must be considered in car park design.

## 4.4 Stabling and Maintenance Facilities

### Context

The proposed stabling and maintenance facility and operational control centre to support the operation of Sydney Metro - Western Sydney Airport will be located to the south of Blaxland Creek between the proposed metro alignment and the proposed corridor for the Outer Sydney Orbital at Orchard Hills. The facility will provide operational functions including the operations control centre and all infrastructure required to maintain a train fleet. Vehicular access will be provided via separate access/egress points on Luddenham Road and Patons Lane (for general staff access as well as delivery and large vehicle access). An internal access road network will provide for general circulation while providing appropriate separation to the main train fleet (with limited crossing points). The site would also be fenced from general public access and lit at night for safety and security. Other ancillary facilities required for the operation of Sydney Metro - Western Sydney Airport include the intermediate services facility, tunnel portal facility, and substations.

### 4.4.1 Stabling and Maintenance Facilities

#### Principle

*Ancillary facilities will be architecturally designed and also given appropriate urban design consideration. Buildings will be robust and functional but modest objects that sit comfortably in their context.*

#### Guidelines

##### General

- The design of ancillary facilities shall be visually unobtrusive and minimise adverse impacts on the surrounding environment, including the existing residential development to the west of the proposed stabling and maintenance facility.
- The design shall minimise visual and acoustic impacts to existing creek lines and fauna movement corridors, including Blaxland Creek.
- Landscape screening will be provided to reduce the visual impact of, and any light spill from, facilities.
- Landscape screening and/or climbing plants shall be used where feasible on facility buildings as a means to deter graffiti.
- The design of the stabling and maintenance facility shall allow for expansion to accommodate a larger, ultimate fleet capacity
- Stabling facilities will incorporate rainwater harvesting and onsite renewables.



## 4.5 Service Facilities and Tunnel Portals

### 4.5.1 Service facilities and tunnel portals

#### Principle

*Ancillary facilities will be architecturally designed and also given appropriate urban design consideration. Buildings will be robust and functional, but modest objects that sit comfortably in their context.*

#### Guidelines

##### General

- The design approach to portal buildings must include considered material choice and expression, appropriate articulation of built form and landscape screening to mitigate building mass.
- Material quality and architectural resolution should be complementary to station architecture.
- The design and materiality of portals must be sufficiently robust for the rail environment yet appropriate to an emerging urban context where they will be highly visible structures in the local environment.
- Consideration of visual, environmental and acoustic impacts of facilities must be included in the design solution.
- Architectural expression of primary structural elements of buildings or structures should be considered in the design.
- Unobtrusive maintenance access shall be allowed for in the design.

