02 Project Metropolitan Planning Context & System Wide Design Framework

Artist Impression of Norwest Station. Source:Ai3D

This section of the report presents a summary of the overarching metropolitan planning context and system wide design framework for the project. The focus is on those aspects of the project of specific relevance to the Urban Design and Corridor Landscape Plan. Greater detail is available from the specialist planning and subject study reports related to the project and listed in Appendix D: Glossary and References.

2.1 Project Context

Sydney Metro Northwest, formerly known as the North West Rail Link (NWRL) is a priority railway transport infrastructure project for the NSW Government. It is the first stage of Sydney Metro.

The Sydney Metro Northwest will be integrated with the CityRail network, and will include eight new stations and services over a 23 kilometre rail line from Epping to Rouse Hill in North West Sydney.

In summary, the Sydney Metro Northwest will include:

- Eight new train stations at Cherrybrook, Castle Hill, Showground, Norwest, Bella Vista, Kellyville, Rouse Hill and Cudgegong Road
- A direct underground connection into the existing Epping to Chatswood rail line at Epping
- An underground section of route comprising 15.5km of two track railway in a twin tunnel configuration between Epping and Bella Vista
- A 7.5km section of above ground route from Bella Vista to the Cudgegong Road Station, comprising a combination of viaduct, embankment, at grade and cutting
- Service facilities at Epping and Cheltenham and the Sydney Metro Trains Facility (SMTF) at Tallawong Road Cudgegong. The SMTF is not part of this UDCLP
- Bus, taxi, kiss and ride, pedestrian and cycling access facilities at all stations
- Commuter car parking facilities at Cherrybrook, Showground, Bella Vista, Kellyville and Cudgegong Road stations.

The line diagram on the following page (Refer Figure 2.1_Sydney Metro Northwest Line Diagram) shows the proposed route of the Sydney Metro Northwest, the stations and facilities along it, broad corridor type (tunnel, at grade etc) and the new centres and planning precincts designated by the NSW Department of Planning and Environment (DP&E).

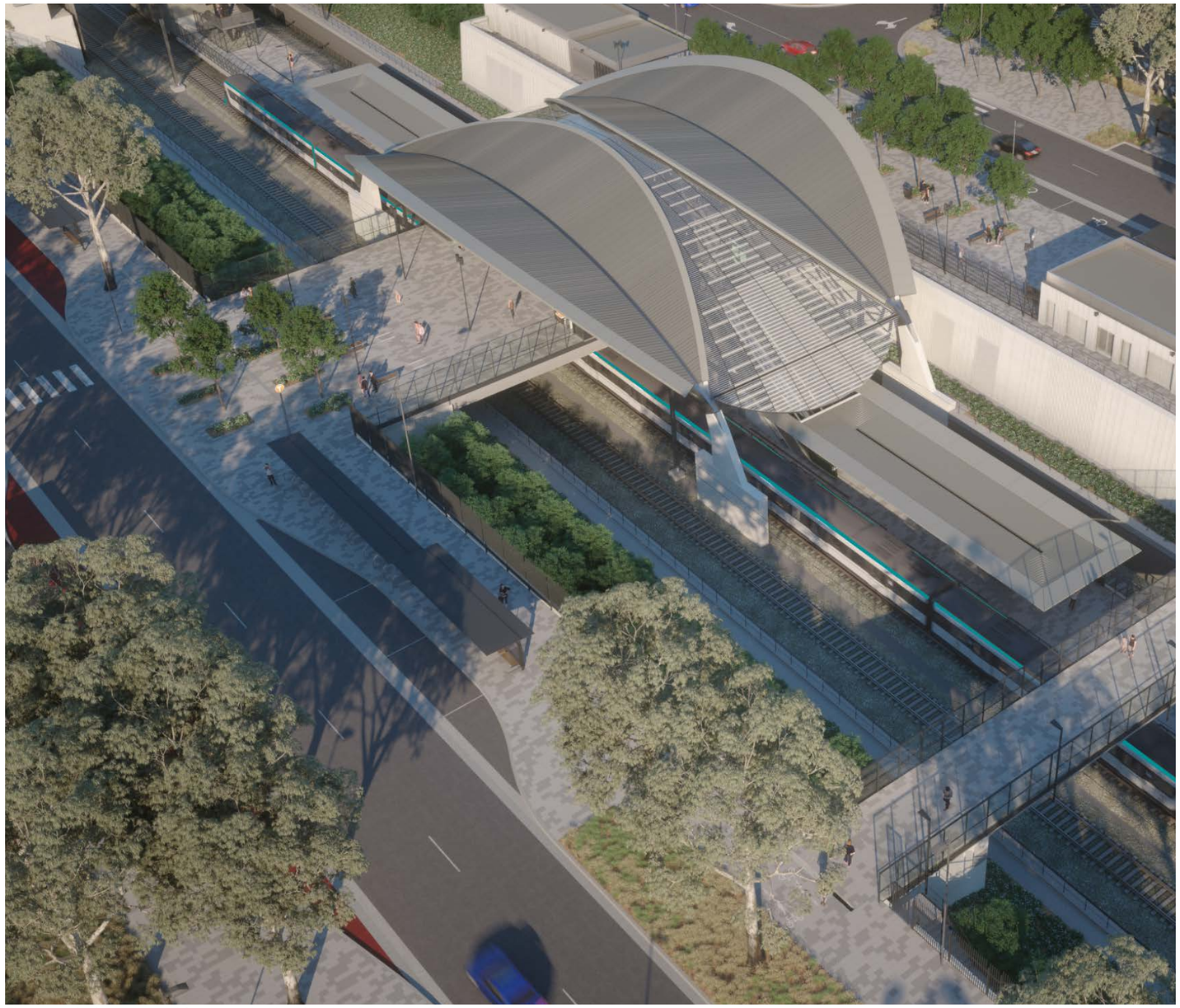


Figure 2.1_Cudgegong Road Station Artist Visualisation. Source: Ai3D.

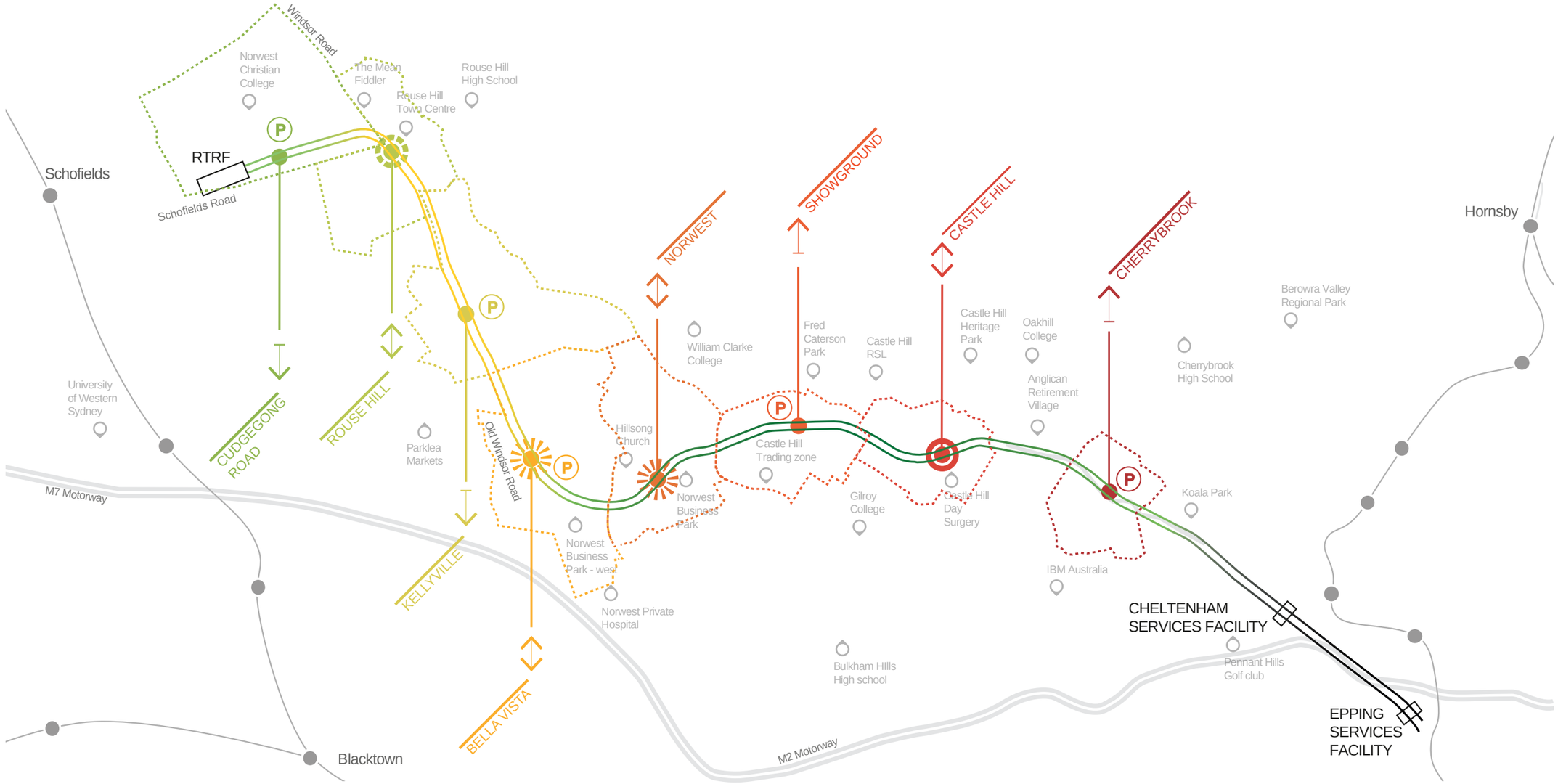


Figure 2.2_Line Diagram. Source: HASSELL.

2.2 Strategic and Statutory Context

The strategic and statutory planning context for the Sydney Metro Northwest project is detailed in numerous documents. Of particular relevance to the urban and landscape design of the project is the North West Rail Link Corridor Strategy (2013) prepared by the NSW Department of Planning and Infrastructure (now NSW Department of Planning and Environment), which draws upon higher level national, state, regional and local planning strategies to prepare the corridor strategy. Those of particular relevance that informed the corridor strategy and the subsequent urban and landscape design include the following.

2.2.1 National Planning Context

2009 Cities Agenda of the Council of Australian Governments (COAG)

Sets out the criteria to ensure Australian capital cities have long term plans to manage growth.

2.2.2 State and Regional Planning Policies

NSW 2021 Plan

The State Government's 10 year strategic business plan to guide policy, Government investment and budget allocation to deliver on community priorities for public services and the provision of infrastructure.

Draft Metropolitan Strategy for Sydney to 2031

Comprises strategies for a 10 year strategic business plan to guide policy, Government investment and budget allocation to deliver on community priorities for public services and the provision of infrastructure. The Draft Metropolitan Strategy identifies a number of policies and actions of particular relevance to the Sydney Metro corridor. The corridor is identified as a key "city-shaper" because of the scale of opportunities for change and investment that will be critical for the growth of Sydney. Refer Figure 2.3_ Draft Metropolitan Plan for Sydney: Vision for Sydney in 2031.

Rebuilding NSW- State Infrastructure Strategy

This identifies and prioritises the delivery of critical public infrastructure for NSW in sectors such as transport, water, electricity, health and telecommunications.

NSW Long Term Transport Master Plan

This plan provides a framework to deliver an integrated, modern transport system by identifying NSW's transport objectives and investment priorities over the next 20 years. The Long Term Transport Master Plan recognises that the integration of land use and transport is a critical feature of the planning for Sydney Metro Northwest. Refer Figure 2.4_Sydney's Rail Future.

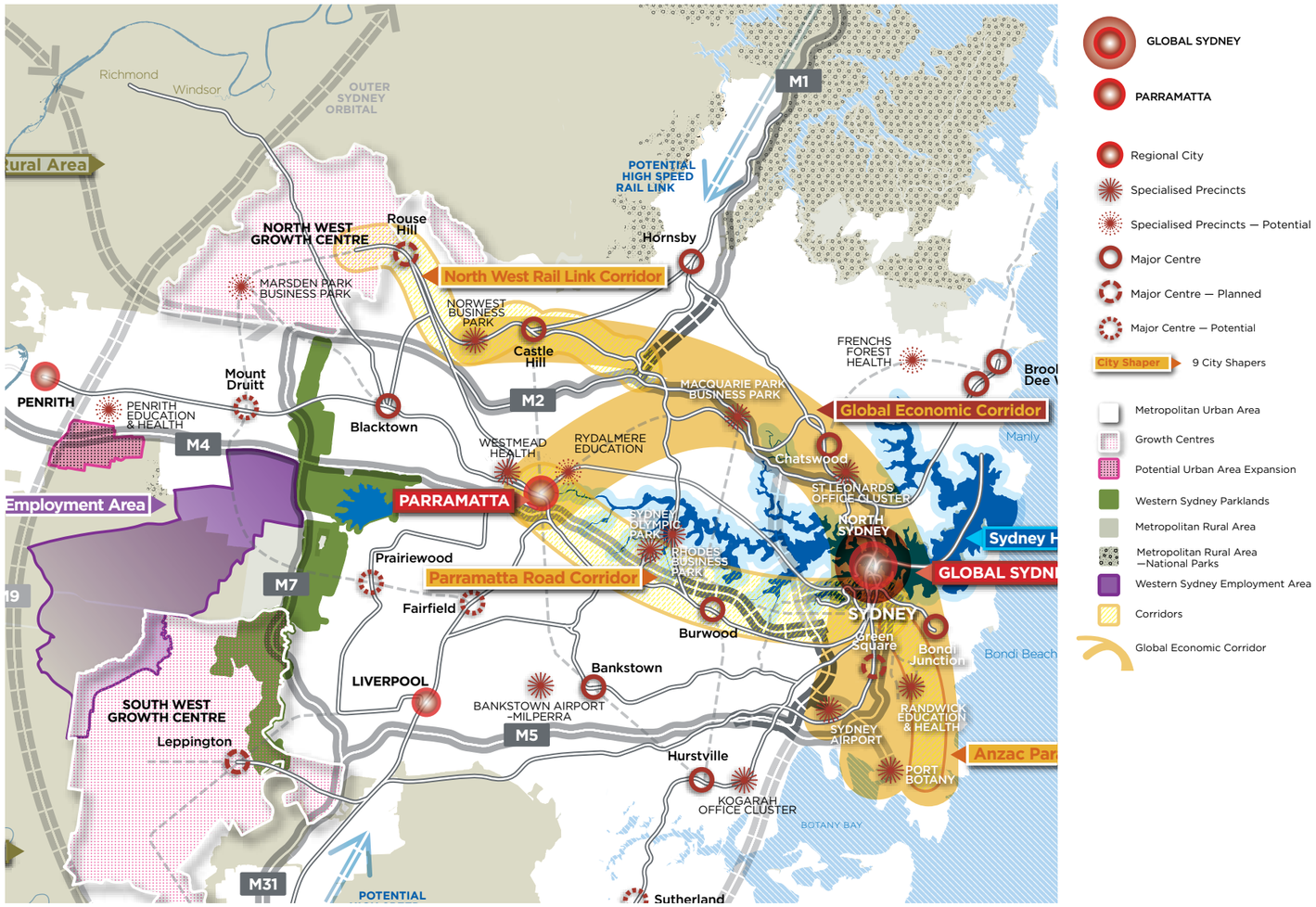


Figure 2.3_Draft Metropolitan Plan for Sydney, Vision for Sydney in 2031. Source: Draft Metropolitan Strategy For Sydney to 2031 (March 2013) NSW Government. The Draft Metropolitan Plan for Sydney describes the strategic significance of the North West Rail Link Corridor in connecting the North West Growth Centre to the city.

A Plan for Growing Sydney, December 2014

This is the NSW Government's plan for the future of the Sydney Metropolitan Area over the next 20 years. The Plan provides key directions and actions to guide Sydney's productivity, environmental management, and liveability including the delivery of housing, employment, infrastructure and open space.

Subregional Planning

Subregional Plans contained in 'A Plan for Growing Sydney', detail how the metropolitan strategies will be applied in Sydney's six regions. There are two subregions traversed by the Sydney Metro Northwest project - North and West Central.

Local Strategic Planning

Relevant local strategic plans developed by Hill Shire Council, Hornsby Shire Council and Blacktown Council LGAs incorporate the local community's aspirations.

The construction of the Sydney Metro Northwest also provides the opportunity to plan for and build liveable centres around each of the proposed new stations, through the creation of sustainable, well designed, higher density mixed use precincts connected by frequent rail and bus services.

This principle of transit oriented development will maximise the benefits of this major rail infrastructure investment, and provide the potential to help deliver dwelling and employment growth for the area. The Sydney Metro Northwest will also support the NSW 2021 goals to grow patronage and increase access to public transport, help communities access jobs and services closer to home, build livable centres and to improve housing availability. The NSW Department of Planning and Environment (DP&E) has worked closely with Transport for NSW (TfNSW) and local councils to ensure future growth along the Sydney Metro Northwest corridor achieves the land use planning goals and objectives of the 'NSW 2021 Plan' and the 'Draft Metropolitan Strategy for Sydney to 2031' by coordinating the provision of housing and employment in close proximity to a reliable public transport system.

The Sydney Metro Northwest has the potential to be a transformative project and provides a once in a generation opportunity to fully integrate land use, transport and infrastructure planning in North West Sydney. It is for this reason it is identified as one of the Draft Metropolitan Strategy for Sydney to 2031's `City Shapers' because of the unique opportunities it presents for change and investment that are critical for the growth of Sydney.

Investment in the Sydney Metro Northwest will help drive a more diverse, competitive and sustainable economy and generate substantial and lasting economic, social and environmental benefits.

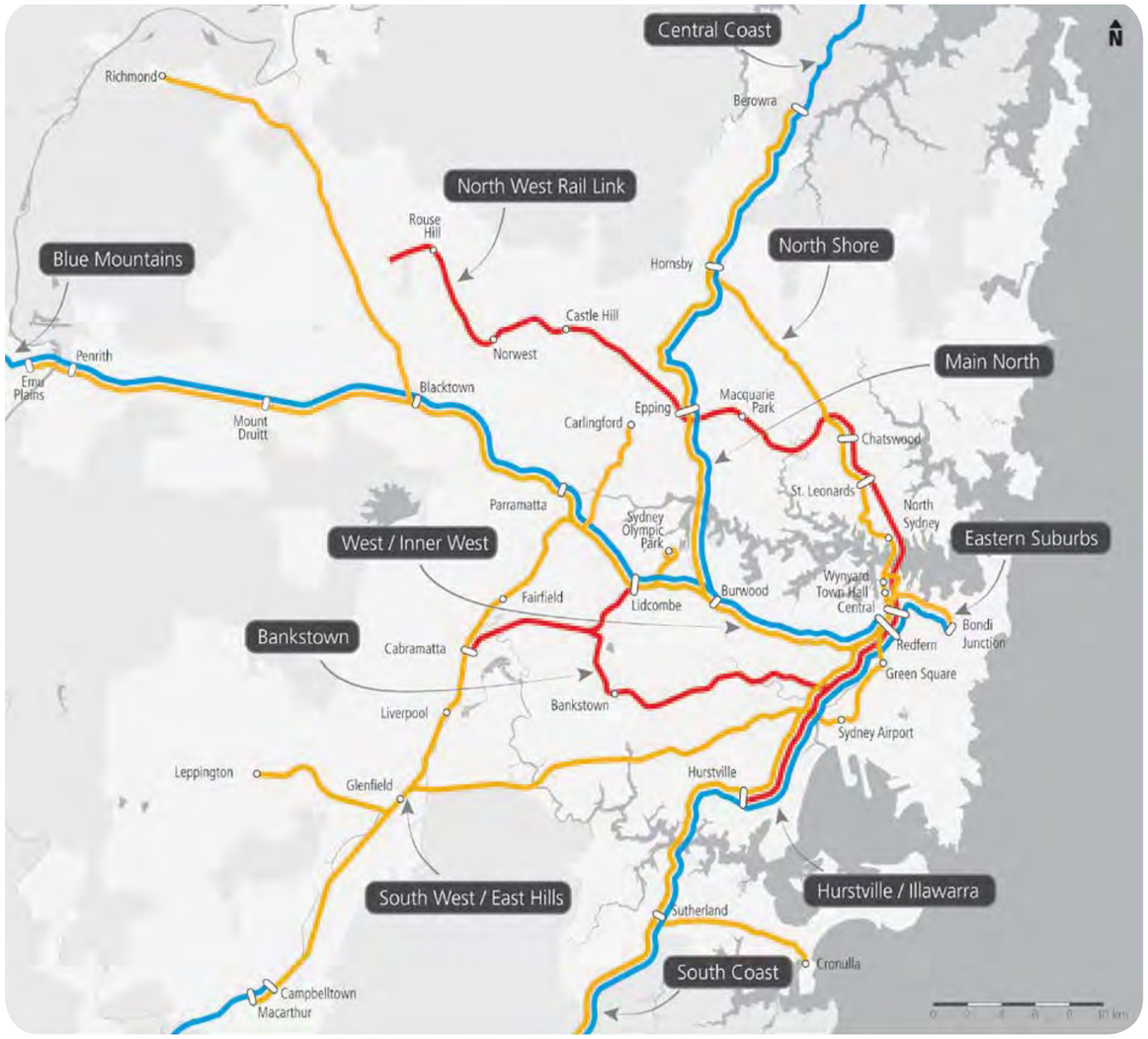
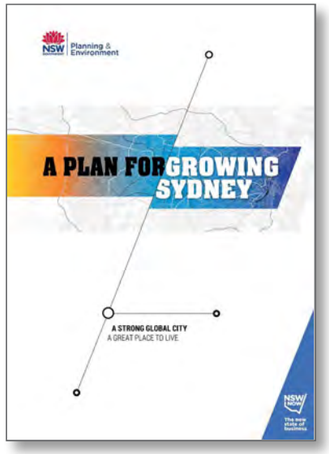


Figure 2.4_Sydney's Rail Futue, Modernising Sydney's Trains (June 2012). Source: NSW Government. The NSW Transport Plan describes the role the North West Rail Link will play in building a long term mass transit network for Sydney that will cross under the harbour and through the CBD towards the South West.

Key Reference Documents

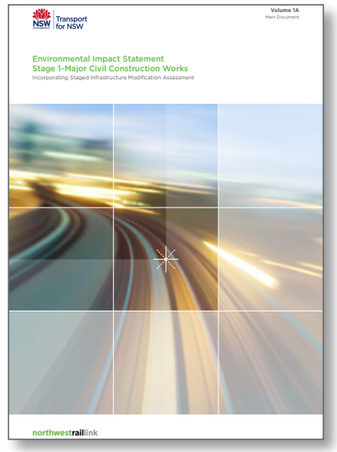
The key reference documents that have informed the urban design and landscape corridor plan as well as the detailed planning and design of this project are listed opposite. These and others to have informed the project work are listed in Appendix D: Glossary and References.

A Plan For Growing Sydney
December 2014



NSW Long Term Transport Master Plan
December 2012

North West Rail Link
Environmental Impact Statement Stage 1-Major Civil Construction Works
March 2012



North West Rail Link Sustainability Strategy
October 2012

North West Rail Link Corridor Strategy
September 2013

North West Rail Link
Environmental Impact Statement
Stage 2- Stations, Rail Infrastrucutre and Systems
October 2012

Bella Vista Station Precinct Proposal
December 2015

Showground Station Precinct Proposal
December 2015

Kellyville Station Precinct Proposal
December 2015

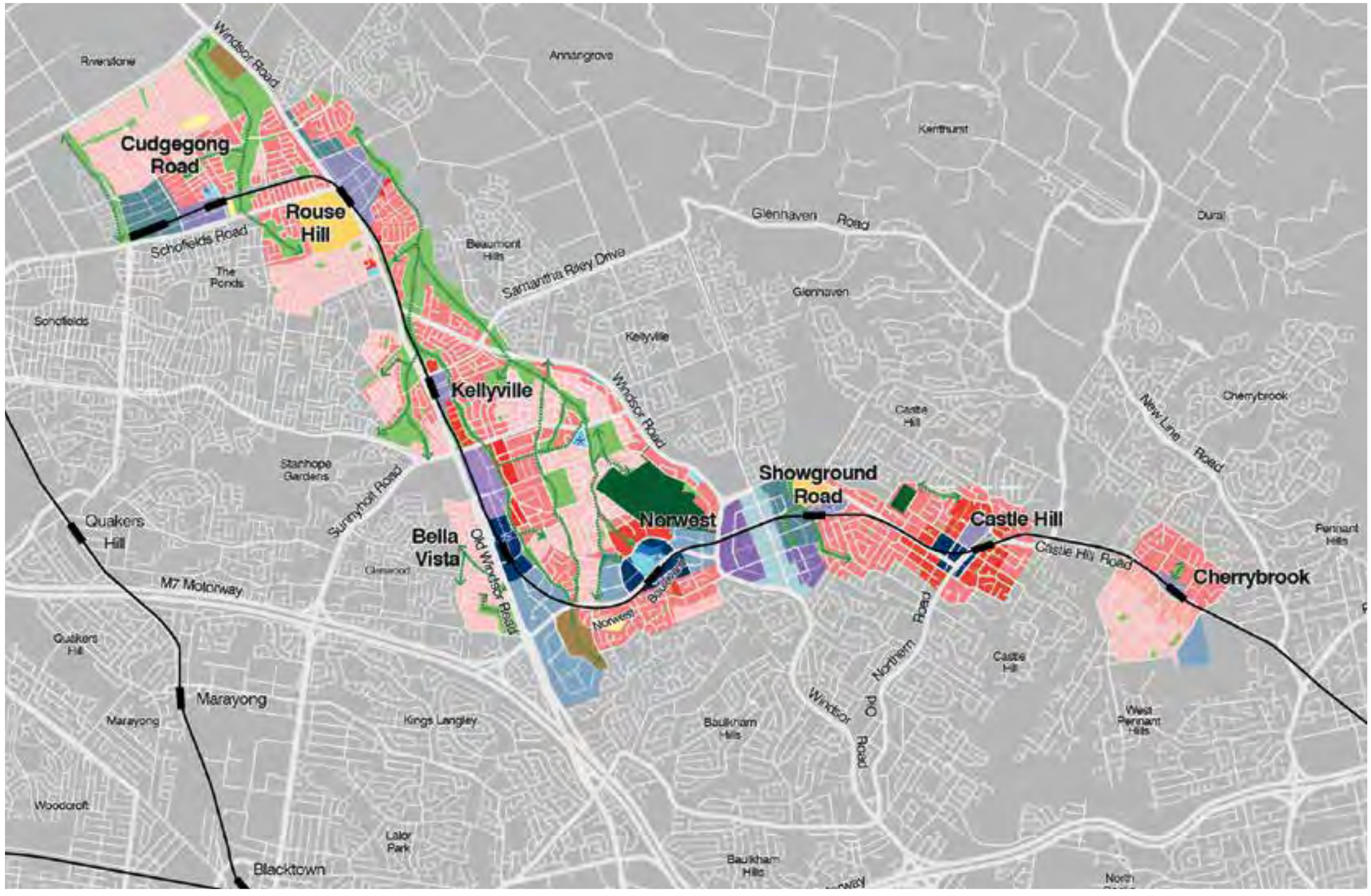
2.3 Functional, Land Use and Transport Context

The 'North West Rail Link Corridor Strategy' was prepared by the NSW Department of Planning and Infrastructure (now NSW DP&E) to give physical form to the functional land use and transport requirements for the surrounding urban area consistent with the policies and strategies contained in the Metropolitan and regional plans. The corridor strategy provides a framework to guide the planning within and adjacent to the corridor and the eight planning precincts it identified, which are traversed by the Sydney Metro Northwest project. Refer Figure 2.5 North West Rail Link Corridor Strategy (next page).

At the local precinct level, further plans developed by the LGA's have been used to ensure the Sydney Metro Northwest project is effectively integrated with its host communities. The corridor strategy is based on three key components:

- Functional relationships by providing direction on how the Sydney Metro Northwest will be integrated with the various components and functions of the areas it traverses (connectivity, amenity, land use, other infrastructure and the environment etc)
- Land use with particular emphasis on the way the Sydney Metro Northwest project acts as a catalyser for future residential and employment lands creation as well as its main components providing service nodes for the surrounding communities.
- Transport in relation to catering for the anticipated passenger volumes generated by the project and the integration of the Sydney Metro Northwest with other transport modes. It also seeks to provide greater conectivity, strengthen existing and provide new links between the new stations and the adjacent communities.

The North West Rail Link Corridor Strategy (Refer Figure 2.5) together with the detailed area or precinct plans provide a framework within which the urban design and corridor landscape plans were developed. Refer Section 3 of this UDCLP for details of individual precinct plans.



Legend

- Study Area Boundary
- Station Platform
- Primary Road
- Secondary Road
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Potential Medium Density Residential subject to further studies
- Commercial Core
- Business Park
- Bulky Goods
- Light Industrial
- Employment
- Local Centre
- Mixed Use
- Special Use
- Public Infrastructure
- Future Local Centre
- Open Space
- Private Recreation
- Heritage
- New Link
- Green Link

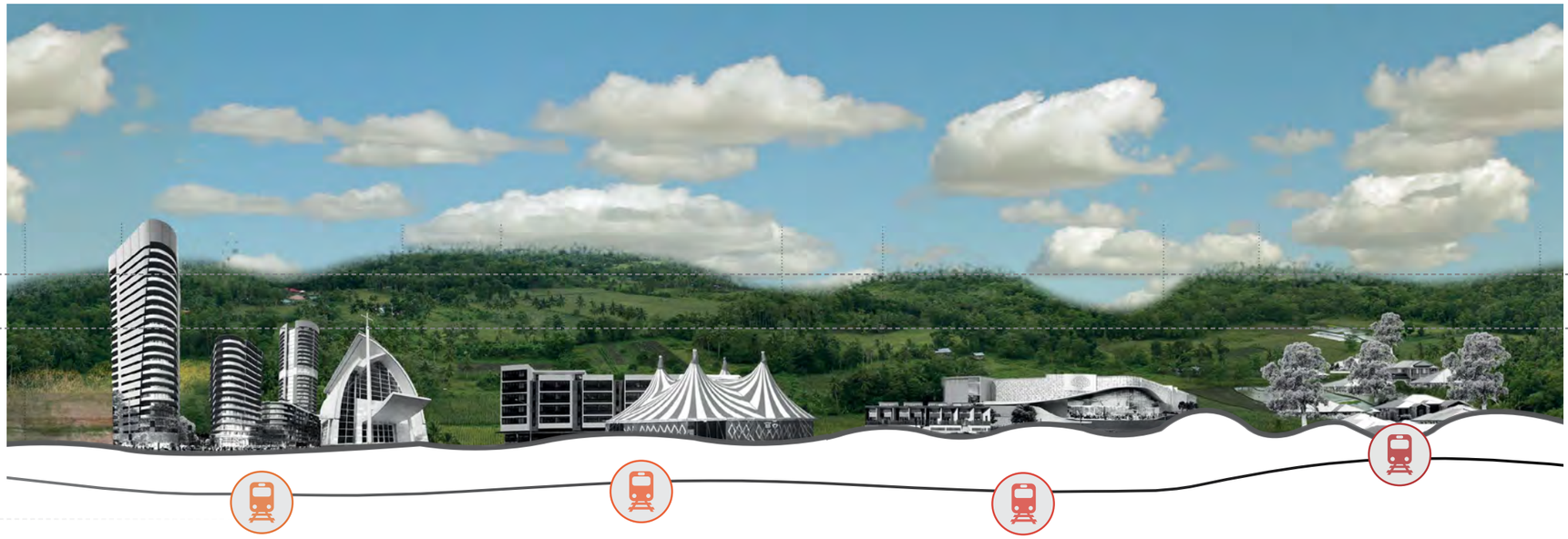
Figure 2.5_ The North West Rail Link Corridor Strategy and describes the proposed framework to guide future planning. It is founded on principles of providing greater connectivity, strengthening existing links and providing new links between the station and surrounding uses. Source: NSW Goverment North West Rail Link Corridor Strategy (September 2013).

The following two page spread illustrates how the Sydney Metro Northwest will be integrated into its urban and natural environment in broad terms, as well as the main features of the project as it traverses the route from west to east. Refer Figure 2.6_Sydney Metro Northwest Urban and Landscape Sectional Context.

This sectional view contains the following information from top to bottom of the page:

- The natural landscape setting
- The urban landscape setting
- The line elevation in relation to the existing ground level
- The names of the main facility locations along the route
- Schematic section of the proposed built form at each facility location
- Project data summary at each facility location.

Figure 2.6_Sydney Metro Northwest Urban and Landscape Sectional Context. Source: HASSELL



	NORWEST	SHOWGROUND	CASTLE HILL	CHERRYBROOK
Natural Landscape Setting				
Urban Landscape Setting				
Relationship to Existing Ground Level				
Station Name	NORWEST	SHOWGROUND	CASTLE HILL	CHERRYBROOK
Station Typology	Cut and cover	Cut and cover	Cut and cover	Open cut
Centre Type	Specialised centre	Future neighbourhood	Major centre	Future neighbourhood
Catchment Area	Employment and residential	Employment, leisure and residential	Employment, retail and residential	Predominantly residential
Depth Below Concourse	21.060m	16.800m	22.100m	6.250m
Height Above Concourse				

2.4 Metropolitan Scale Design Objectives and Vision

A high level metropolitan scale project vision has been adopted for the urban and landscape design of the project, which is to:

"deliver a new infrastructure model, an urbane, civic and people centric product, which promotes improved liveability and quality of life, connectivity and safety and which, enables the future growth of the North West."

This vision is based on the following precept:

"A sustainable city built upon civic infrastructure".

Planning and design objectives based on TfNSW's strategies relating to customer experience, construction and operations and project delivery have been adopted to inform the design of all elements of the project. From these, seven core design principles have been defined to drive the development of this urban design and landscape corridor plan and the built form elements.

These high level considerations are derived from and complement the main Customer Service Drivers defined by TfNSW.

The TfNSW's customer satisfaction service drivers are listed below.

- Timeliness
- Information
- Ticketing
- Convenience
- Accessibility
- Cleanliness
- Comfort
- Personal Safety and Security
- Customer Service

The suite of system wide design aspirations and principles developed from these customer service drivers is summarised on the adjacent diagram (Refer Figure 2.8_ Project Vision. Taken from TfNSW Operations, Trains and Systems Volume 1 Overview) and accompanying text and elaborated on the following pages.

1_Integrated, Safe, Efficient, Enjoyable Experience

- Maximise customer safety and feeling of safety
- Maximise journey efficiency
- Create a memorable experience
- Consider the complete experience door to door
- Make the journey simple and intuitive
- Ensure the journey is accessible to all
- Focus on the detail that people touch

2_Beautiful Places and Buildings

- Reduce energy use, maximise passive performance
- Optimise renewables
- Optimise water catchment and re-use
- Consider whole of life requirements
- Regenerate local habitats
- Minimise waste

Figure 2.7_Project Vision. Taken from TfNSW Operations, Trains and Systems Volume 1 Overview. Source: TfNSW

3_ A Natural Systems Approach

_ Define and enhance the unique qualities of each station location [specific to 'The Hills' and 'The Plains']
_ Respond to the local environment, micro climate and topography
_ Reinforce local networks and connections, people and environment
_ Focus on design excellence, quality and coherence

4_Embedded Social Infrastructure

_ A key community use future proofed at each station
_ Use of integrated art to reinforce community identity, culture and heritage
_ Accommodate future activity/ development specific to local needs

5_Safeguarding Future Growth

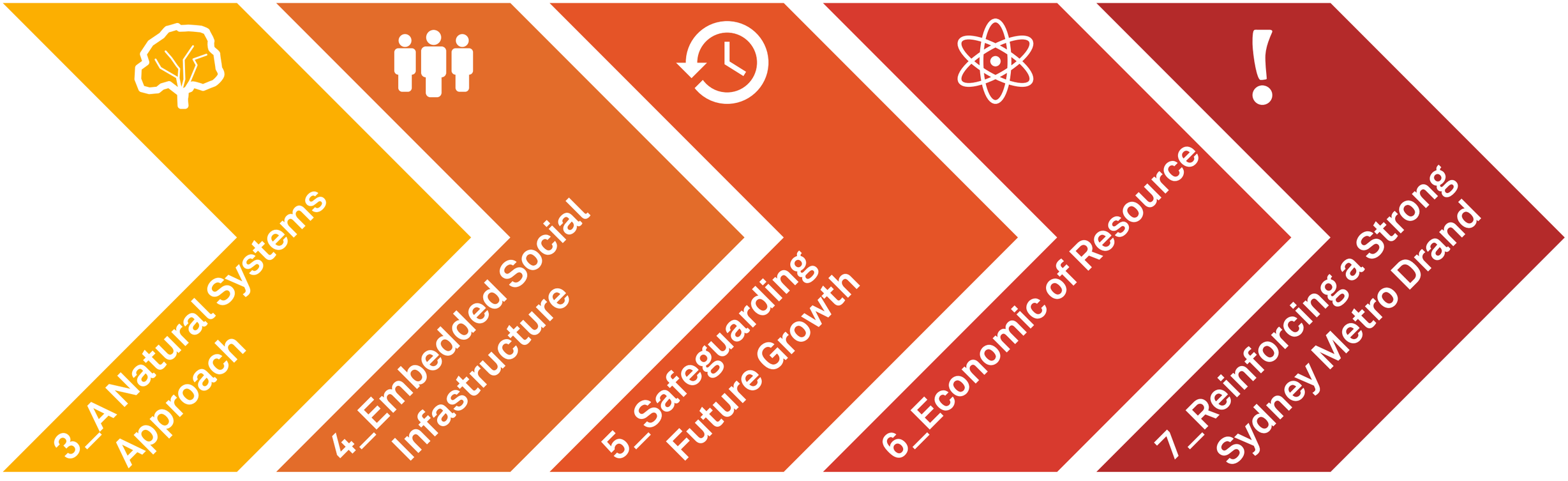
_ Build in flexibility
_ Built to last
_ Visionary
_ Demanding of current technology

6_Economic of Resource

_ Minimal use of structure and materiality
_ 'Kit of Parts' strategy
_ Energy efficient
_ Cost effective

7_Reinforcing a Strong Sydney Metro Brand

_ A family of distinctive and identifiable elements
_ A coherent design language that reinforces the transport brand
_ Use of a 'Kit of Parts' strategy
_ A language that ties into existing stations



2.5 Urban and Landscape Design Values and Approach

The seven core design principles used as the basis for the planning and design of the Sydney Metro Northwest are elaborated on in this section by discussion of the values that underpin them and the associated initiatives/responses designed to integrate rail infrastructure, stations and facilities into their existing and proposed settings.

2.5.1 An Integrated, Efficient, Safe and Enjoyable Experience

The Door to Door Journey

The integration of the travel experience into the wider network is incredibly important for the success of Sydney's Rail Future. The customer journey begins at home and in the local neighbourhood and progresses through a sequence of experiences: buying, seeking and receiving information, departing, travelling and arriving.

The Sydney Metro Northwest design will create a seamless customer journey experience, an effortless progression of activities and a familiar and delightful part of everyday life. Refer Figure 2.8.

Immersion and Release

The journey from Cherrybrook to Cudgegong Road will be a rich sequence of spatial and sensory experiences. These spatial and sensory experiences will comprise:

- ***Grounded with relief*** – deep cavern, tunnel, open box, tunnel, occasional glimpse of sky
- ***Engagement with outlook*** – station cutting, corridor cutting, largely continuous view of sky
- ***Elevation and immersion*** – at grade, embankment and viaduct, immersion in the landscape and big sky of the North West.

The travel experience will be a progressive sequence of *'immersion and release'*. Immersion in grounded space and release into the light. Throughout this journey, the local landscape, geology, flora, vistas are accented and used to articulate the travel experience.

At the *'grounded'* stations of Castle Hill, Showground and Norwest and the *'engaged'* stations of Cherrybrook, Bella Vista and Cudgegong Road daylight will be maximised to provide spatial relief and connect with the local conditions on the surface.

Where the rail line emerges from the tunnel and into the linear park north of Bella Vista, the customer experience will be richer and more diverse.

Customers will experience short, medium and long distance views from the viaduct of the Cumberland Plain Woodland Landscape.

The *'elevated'* stations at Kellyville and Rouse Hill will optimise the views as grand belvederes and the immersion of the customer in a Cumberland Plain Woodland landscape.

A Pleasure Ground

From Kellyville to Cudgegong Road the Sydney Metro Northwest corridor varies in width and can support pedestrian and cycle routes.

The corridor will provide an opportunity to enable the enhancement of the existing landscape, the creation of new habitats and the provision of active open space integrated with the local community and transport development.

Modal and Service Integration

A modal hierarchy has been adopted that prioritises allocation of space within transport interchanges in the order of pedestrians, cyclists, bus/taxis, kiss and ride, and park and ride.

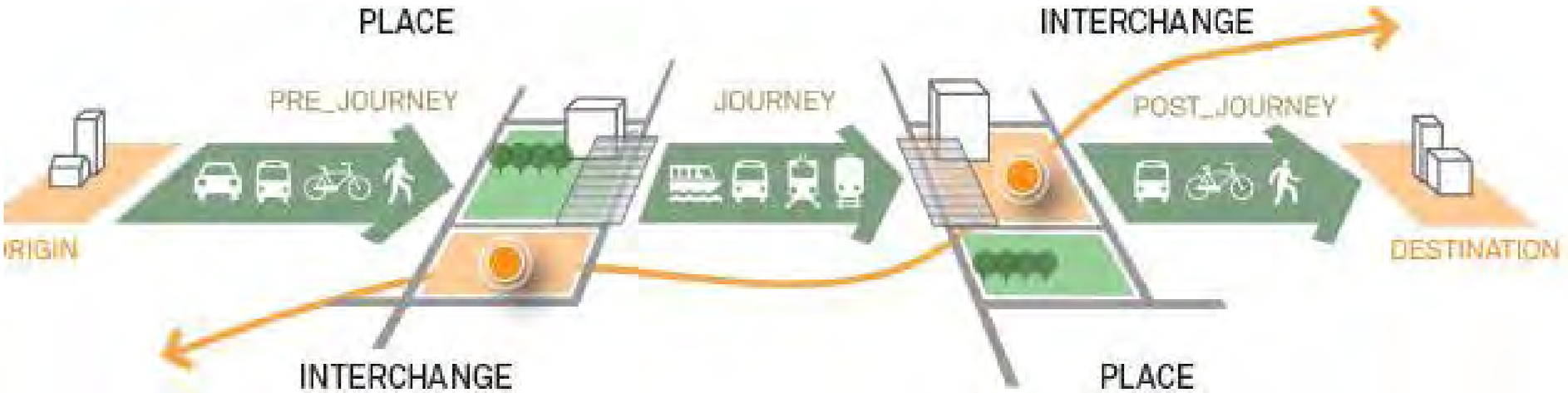


Figure 2.8_The Door to Door Journey – Making Interchange Places. Source: HASSELL

Connectivity – Physical, Social, Visual, Technological and Economic

Connectivity is the essence of a humane place and an efficient and equitable transport service. All the Sydney Metro Northwest stations will be:

- Served by a fine, interconnected network of local streets
- Conjoined to a substantial public place, street, park or promenade
- Integrated with a proposed program for social squares and future multi purpose social hubs
- Set in open, barrier free and comfortable spaces
- Served by the latest information, communications systems, efficient lighting and signage
- Activated by local commerce, retail and community activities.

The stations and the corridor will provide both longitudinal and lateral connections for the local community. These connections will be in the form of shared paths and bridge connections over major roads and the rail corridor where possible.

2.5.2 A Natural Systems Approach

The approach to the urban and landscape design of the Sydney Metro Northwest is strongly based on consideration of the conservation of the natural values of the North West region of Sydney and the integration of the Sydney Metro Northwest with the regional and local environment it traverses.

Climate, Geology, Landform: Landscape

The North West region of Sydney has a benign climate but as it is remote from the tempering influence of the ocean, it experiences hot, humid summers (mean max: 5°C hotter than the CBD with hot west and north west winds) and cold dry winters (mean min: 4.5°C colder than CBD with cold southerly and westerly winds). The region experiences occasional hail storms and frosts.

The stations, precincts and corridor will ameliorate the harsh aspects of this climate by:

- Providing generous shade in summer
- Providing generous wet weather protection
- Enabling access to warm sunlight spaces in winter
- Allowing buildings to be naturally ventilated

An Urban Ecology

The principles of urban ecology are a key aspect of the approach to the design of the Sydney Metro Northwest. This means the protection of habitat, the use of endemic species, the minimisation of waste, the recycling of resources, use of local materials and the minimisation of energy use.

Application of urban ecological principles underpins a broad suite of initiatives including ground water recharge, infiltration, insulation of buildings, installation of green roofs, water harvesting, collection, treatment and reuse, recycling programs, replanting programs, urban wetlands and bioswales – as these are the essential tools of an urban ecology.

The Hills and Plain

The Sydney Metro Northwest will pass through two distinct landscape settings and a memorable sequence of landscape character types; predominantly the steeply undulating, cool, forested and enclosed ridges and valleys of the Hills District, and the more expansive, warm, dry and undulating plains and shallow creek lines of the Cumberland Plain. Refer Figure 2.9_ Regional Environment-The Hills and Plain.

These settings and character types will be the foundations of the stations, precincts and corridor design, and will help shape a truly memorable customer experience. Refer Figures 2.10_Station Precincts and the Regional Environment within the Local Context and Figure 2.11_Station Precinct Local Context.

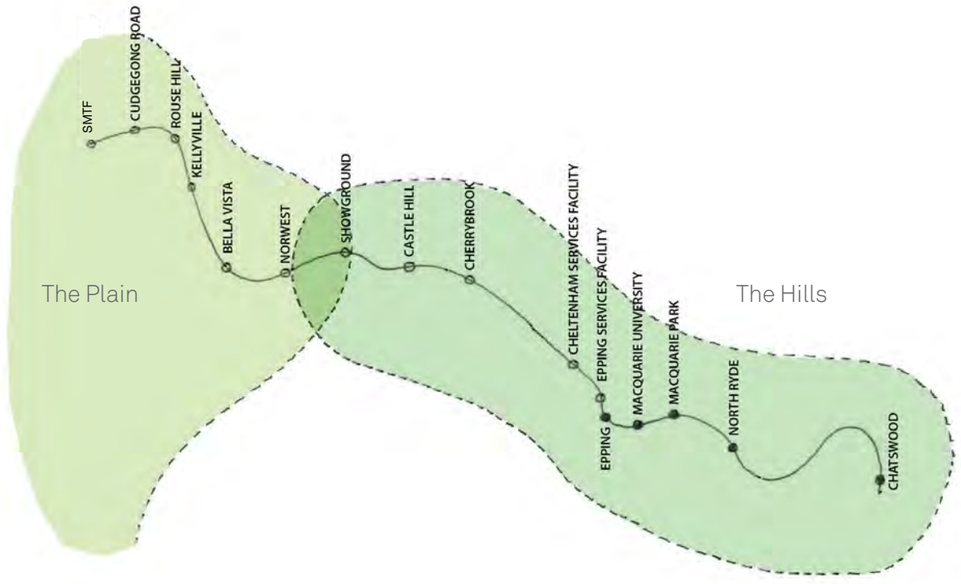


Figure 2.9_Regional Environment- The Hills and Plain. Source: HASSELL

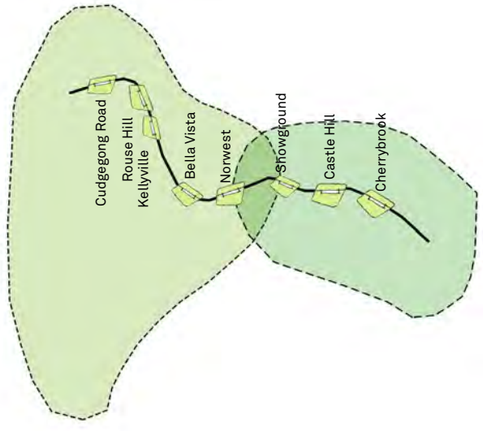


Figure 2.10_Station Precincts and the Regional Environment within the Local Context. Source: HASSELL

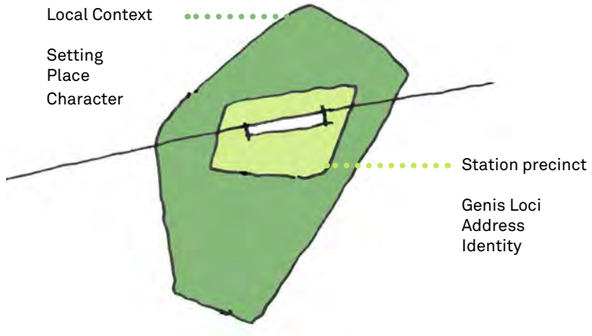


Figure 2.11_Station Precinct Local Context. Source: HASSELL

Six Creeks: Six Corridors

The Sydney Metro Northwest follows the southern border of the Hawkesbury River catchment. The dendritic patterns of its tributaries, Second Ponds, Caddies, Elizabeth Macarthur, Smalls and Cattai creeks fan across the corridor alignment (Refer Figure 2.12_ Six Creeks: Six Corridors). These riparian zones are the life source of the Hawkesbury River and are essential interconnecting fingers of habitat, movement, recreation and amenity for North West Sydney.

Revegetating North West Sydney

Over time the pre-European landscape of the Sydney Basin has been given over to the needs of a growing metropolis. From early agricultural holdings, to small villages and then rapid post war expansion of urban development with extensive roads and subdivisions. Little of the original habitat and vegetation of North West Sydney remains.

The scale and location of the Sydney Metro Northwest presents an opportunity to contribute to a grand landscape legacy – the revegetation of North West Sydney.

At all stations, precincts and throughout the corridor, the Blue Gum High Forest, Turpentine and Ironbark Woodlands, and Cumberland Plain Woodlands relevant in each locale will be reinstated using signature trees to provide a canopy at the stations, which will protect, shelter and define public space.

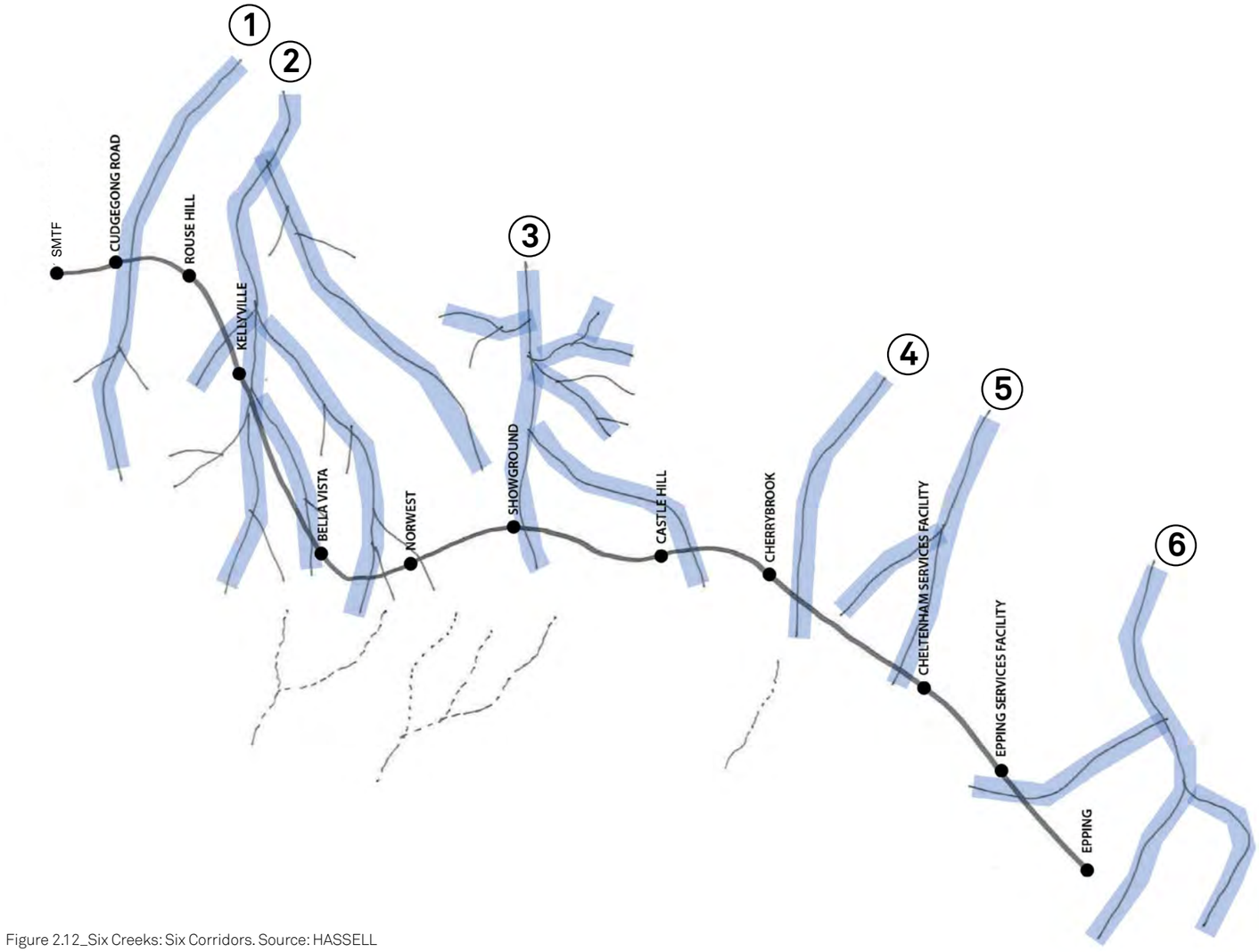


Figure 2.12_Six Creeks: Six Corridors. Source: HASSELL

2.5.3 Beautiful Places and Buildings

Beautiful, signature places and buildings will be the legacy of the Sydney Metro Northwest.

The design focus is to deliver world class, customer focussed stations and precincts that are equivalent to the contemporary benchmarks of urban rail networks such as Copenhagen Metro, and locally, the Epping to Chatswood Rail Link.

Each station and station precinct will encapsulate the spirit of place, the 'genius loci' of its locale eg Cherrybrook (Blue Gum High Forest), Castle Hill (Arthur Whitling Memorial Park), and Showground (Turpentine Ironbark Forest).
Each station locale has a distinctive character, purpose and pattern of land use and occupation.

The design response is to address these unique place defining characteristics and activate the public life of the local community.

The introduction of social squares and future community pavilions at each of these important civic spaces will engage the local community and amplify a sense of place.

Figure 2.13_Artist Visualisation of Bella Vista Public Plaza and Station Canopy. Source: Ai3D

2.5.4 Integrated Public Art_Light Line Social Square

Light Line Social Square, the Public Art Plan for Sydney Metro Northwest, will transform the experience of the customers and communities of the North West in a holistic expression of artful place. It will work at both the scale of the network as a whole and at each station locale.

Light Line Social Square seeks to transcend conventional public transit by creating stations and precincts which bring delight and joy to customers. It seeks to elevate the human spirit, instil community pride, encourage social interaction and promote vibrant meaningful places that are an intrinsic part of everyday life.

The plan fuses art, environment, architecture, urban and landscape design, heritage, lighting, engineering and science with social, economic, environmental and transport initiatives to create a network-wide, and locally specific, total experience of place.

A suite of conceptual ideas founded in memory, place, colour, time and light provide the genesis of ***Light Line Social Square***. Refer Figure 2.15_Light Line Social Square - Fusion of Memory, Place, Colour.

The remembrance of the area's rich agricultural past underpins ***Light Line Social Square***'s integrated, programmed and participatory public art framework. This memory of cultural and economic heritage is inter-woven with the region's endemic landscape fusing past and present, natural and cultural into a contemporary place based response.

Implementation of ***Light Line Social Square***, the Sydney Metro Northwest Public Art Project Plan, will transform the experience of the customers and communities of the north west in a holistic experience of artful place.

Light Line Social Square will work at both the scale of the network as a whole and at each station locale.

Light Line presents a vision for the entire Sydney Metro network. Using linear LED light, a spectrum of cast and electronic colours and temporal program along the length of the network will enrich each passenger's journey from street, to concourse, to platform, to train and to each station.

Social Square will unite each locale along the network drawing references from the indigenous and cultural landscape to create spaces of environmental light, skylight lanterns, fields and facades of cast colour, playful rooms, restful spaces and loose fit pavilions as places of social inclusion and economic vitality.

Each station precinct will be read as a 'public' spatial element distilled and clearly identifiable as civic markers and attractors amongst the developing and enveloping urbanity.

Through the experience of ***Light Line Social Square*** the stations and precincts will create a sense of delight and respite, belonging and engagement for the community and elevate the sense, quality and enjoyment of the journey for everyone.

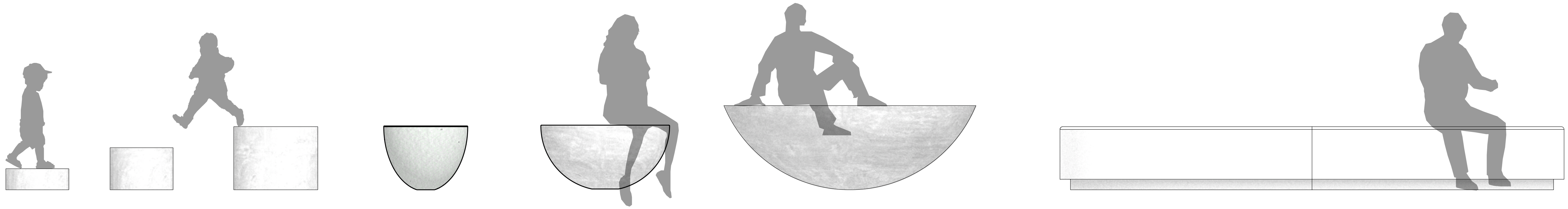


Figure 2.14_Light Line Social Square Social Spheres. Source: Turpin Crawford McGregor Westlake

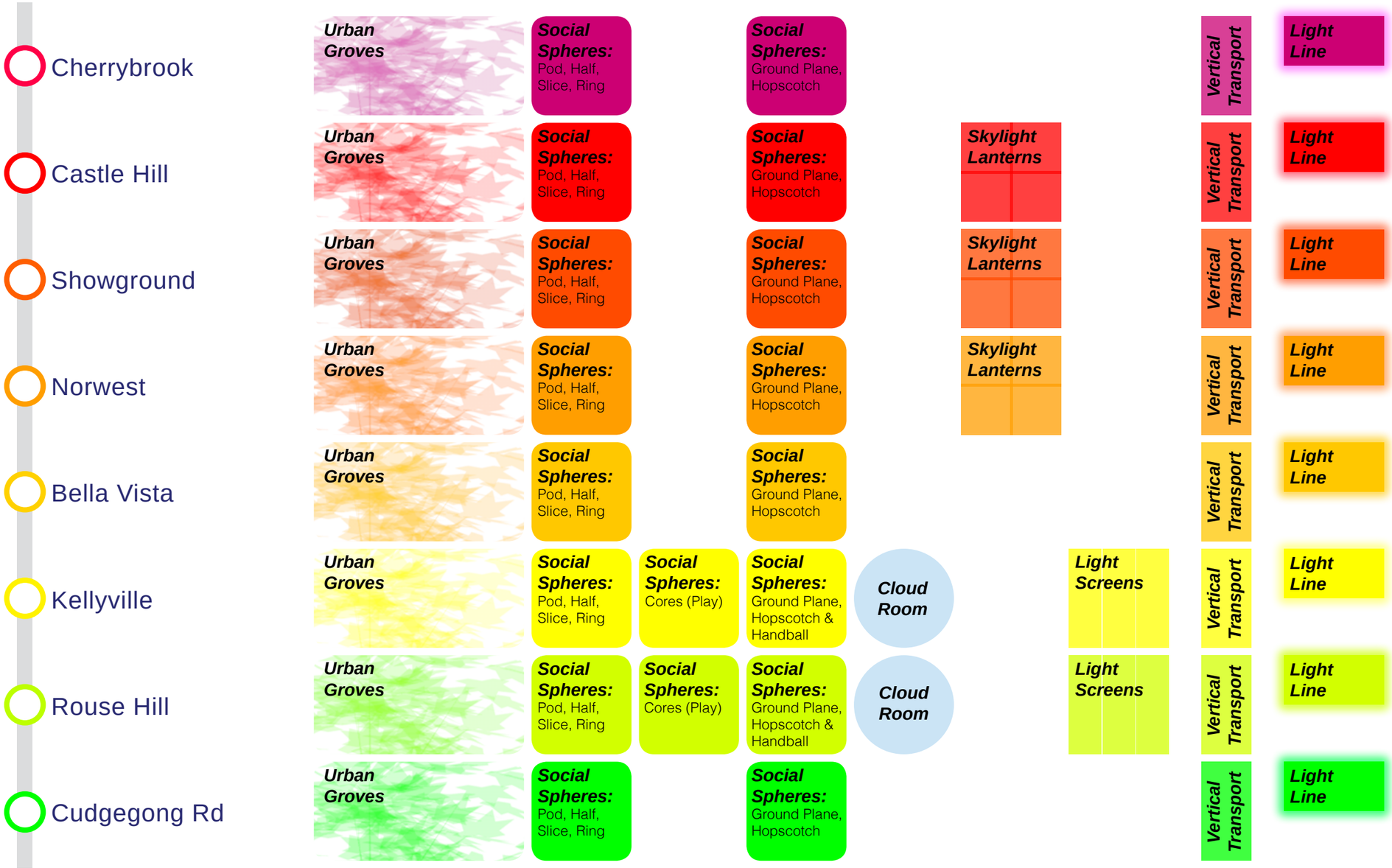


Figure 2.15_Light Line Social Square - Fusion of Memory, Place, Colour. Source: MWA with T+C Studio.

2.5.5 Safeguarding Future Growth

The ability of the stations and other facilities of the Sydney Metro Northwest to be able to adapt to the needs of their host communities as they change over time is of considerable importance to the future proofing of the Sydney Metro Northwest. This will be achieved through the following architecture and urban design initiatives:

- Future underground entries are safeguarded at Castle Hill, Norwest and Showground
- Scalable forms are provided allowing for canopy extension at Showground, Kellyville, Bella Vista and Rouse Hill
- Potential integrated over site development can be accommodated as an option at Showground (in the station precincts and above the structured car park) and Norwest (adjacent development site), stimulating urban renewal and providing additional development land.

2.5.6 Economic of Resource

The responsible use of resources has both sustainability and economic benefits for the project. This has been achieved in the design of the station precincts by:

- the minimal use of structure and a limited material palette
- modularity through the use of a 'Kit of Parts' strategy
- being attuned to the need to be both energy and cost efficient in the selection of technologies, materials, construction and operational methods in the design of facilities.

Examples of how this design principle will be applied and the desired results achieved on the project include the following.

Low Energy, Long Life Buildings

The Sydney Metro Northwest stations and precincts will incorporate a raft of essential energy, water and resource saving initiatives including:

- natural ventilation
- low embodied energy materials
- recycled materials – timber and steel
- low energy and energy saving fittings and equipment
- daylight harvesting and dimming control
- optimised shading for comfort and glare control
- passive design to control prevailing winds for comfort control
- rainwater harvesting for irrigation demands
- design for climate change adaptation
- low carbon material selection and life cycle assessment
- sustainable supply chain.

Kit of Parts

Significant quality benefits, economies of time and cost and reduced risk can be achieved by the modularisation of the station's design. A 'Kit of Parts' (KOP) approach will be employed in the design, documentation and procurement of common architectural and public domain elements summarised as follows:

- canopy roofs and ceilings
- customer service modules
- lifts, escalators, and stairs
- walls, floors and pavements
- screens, barriers and fences
- furniture, fittings and equipment
- bike shed pavilions.

The conceptual approach to one element of the 'Kit of Parts' for this project is illustrated in Figure 2.16 on the following page. The 'Kit of Parts' is elaborated on further in Section 4 System Wide Components.

Table 2.1_Summary of 'Kit of Parts' Benefits

Item	Benefit
Consistent line wide identity	_ Provides the customer and community a recognisable and enduring Sydney Metro Northwest design for orientation to the stations and community pavilion _ Provides the operator with a distinctive brand identity to attract customer use
Standardisation of components	_ Reduced unit cost, rationalise maintenance and replacement _ Interchangeable components for potential repurposing _ Replacement and recyclability of components _ Flexibility _ Scalable: readily extendable or reducible
Prefabrication	_ Quality control _ Dimensional tolerances control _ Reduced onsite construction time _ Reduced material waste in manufacture
Integrated services	_ For 'plug in' installation (power/data, hydraulic, mechanical and electrical) _ Reduced on-site construction time _ Standardised fittings _ Inbuilt spare capacity _ Potential for zoned and auditable energy use
Integrated energy efficiency technologies	_ Modules adapted for current and future technologies _ Expandable to meet demand _ Reduced potential for unsightly retrofitted elements _ Potential for future material/energy technologies built into design
Transportable module dimensions	_ Enables efficient installation _ Reduced onsite adaptation _ Reconfigurable to suit station layouts
Sustainable	_ A highly sustainable approach, increasing the product life cycle, and minimising energy, material usage and waste

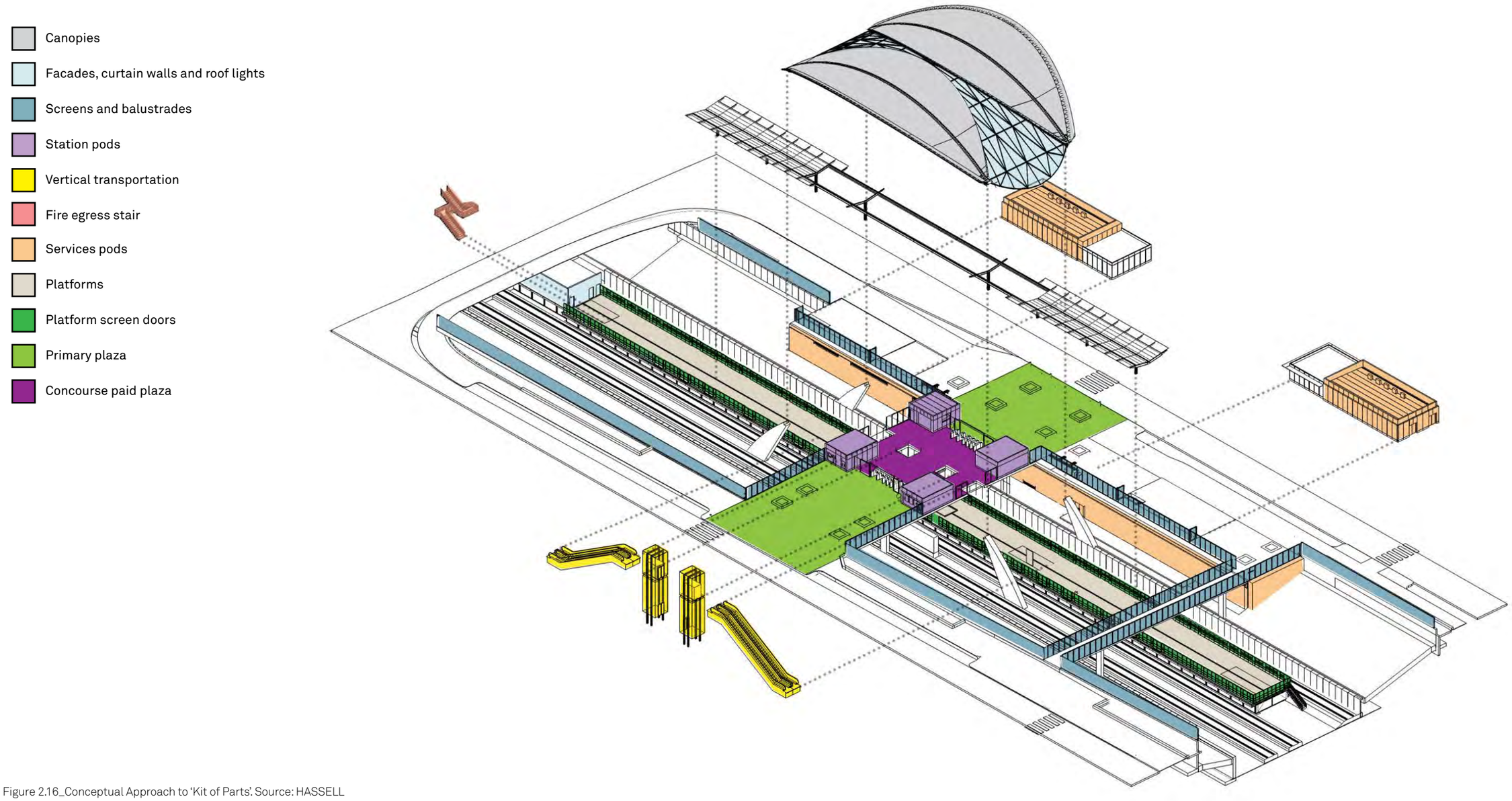


Figure 2.16_Conceptual Approach to 'Kit of Parts'. Source: HASSELL

2.5.7 Reinforcing a Strong Sydney Metro Brand

TfNSW has established a brand strategy for Sydney Metro Northwest. It is a brand which is of its time. The project design will promulgate this brand, which will be contemporary, sustainable and convey quality. The design response to branding is underpinned by the use of a common design language achieved though consistent form, details, materials, equipment and finishes (Refer to Section 4 System Wide Components).

The design presents a cohesive and readily identifiable product solution that ties the formal expression of elements to a common structural and geometric logic. This logic will also be responsive to the particular circumstance of each place, where variations of topography, land use or station program demand adaptation. This approach encapsulates the twin notions of consistency and diversity.

Consistency

Consistency will arise from the repetition of geometric forms and profiles, in material selection and application, and in the design of elements and the selection of equipment and finishes.

Diversity

Diversity will emerge from the specifics of each place and program of uses. The public art colours will vary relative to each locale. The extent and resolution of each canopy will respond to the station configuration, and the design and function of the public domain will respond to each interchange and location specific community needs.

These seemingly conflicting objectives will be achieved through the proposed 'Kit of Parts'. An approach to the modularisation of design, manufacturing, delivery and installation, which when implemented will provide meaning and richness to the experience of the Sydney Metro Northwest.

Colour and the Sydney Metro Network

The colour spectrum of ***Light Line Social Square*** will encompass the entire Sydney Metro Network. Stations along the Sydney Metro Northwest project will be identified using place specific colours that are part of a wider colour palette concept for the Sydney Metro brand applied throughout the system. Refer Figure 2.17_Sydney Metro Northwest Public Art Plan Colour Spectrum Concept.

In a Sydney-wide story, the verdant greens of the Plains and warm hues of the northwest transition in the cavern stations and tunnels.

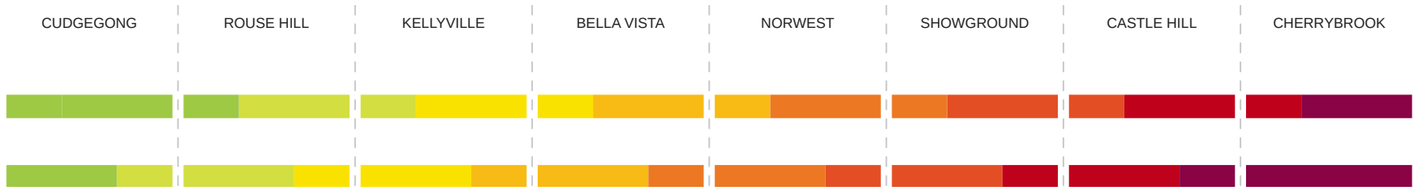


Figure 2.17_Sydney Metro Northwest Public Art Plan Colour Spectrum Concept. Source: MWA with T + C Studio.

2.6 Design Themes and Conceptual Approach

2.6.1 Station Precinct Design Principles

Four design principles inform and underpin the design response at all scales of the Sydney Metro Northwest. This will ensure a seamless and integrated treatment of all elements of the public domain to be experienced by patrons and the community at large. The scales vary from the city scale, such as the overarching landscape design themes to be applied throughout the corridor, to the public domain spaces and the built form elements within them.

The four design principles have been derived from the project design principles described in Section 2.5. These are consistent with an overarching philosophy to create "Living Infrastructure". Refer Figure 2.18_Sydney Metro Northwest Gradation Concept.

Further detail about the system wide componentry is contained in Section 4 System Wide Components

1_Gradation from Landscape to Station

rough to smooth, formal to informal, movement to stationary, circulation to waiting, natural bush re-vegetation to civic planting character

2_External Resilience, Internal Warmth

hard shell, soft warm welcoming inside, heroic scale to human dimension

3_Accent Colour and Texture

for intuitive wayfinding, a subdued and calm background or station specific, colour where people touch, colour planting species to highlight civic entries

4_Modularity and Verticality

a simple canvas for activity, not prescriptive, able to accommodate future change

Figure 2.18_Sydney Metro Northwest Gradation Concept. Source: HASSELL

2.6.2 Line Wide Consistency and Precinct Identity

Inherent in the experience of Sydney Metro Northwest are a set of consistent concepts, design themes and approaches to the station architecture and public domain elements. This provides a sense of familiarity and legibility for customers using the rail line.

Station typology is a linewide concept applied to local context. Each station has a typology which relates to the individual precinct and emphasizes the relationship with the natural ground plane: Elevated, open cut, and cut and cover. Refer Figure 2.19_Sydney Metro Northwest Station Elements to Typologies Concept.

At each station there is a local site response to the nature of that place. Each precinct has a distinct identity which responds to the character of that landscape setting. Each precinct will have a distinctive signature through the application of station typology and the insertion of distinctive elements to encourage a precinct identity to become established.

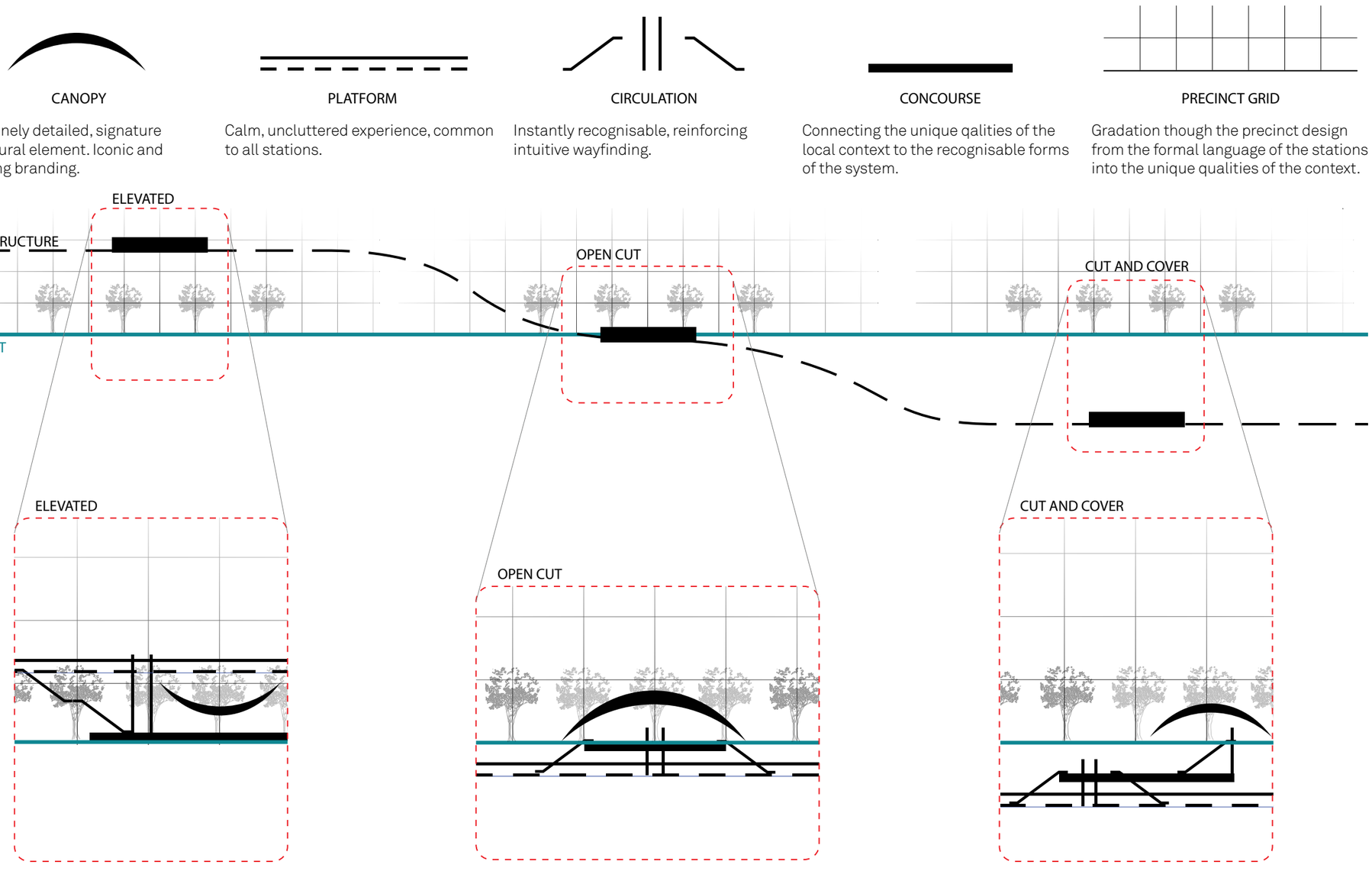


Figure 2.19_Sydney Metro Northwest Station Elements to Typologies Concept. Source: HASSELL

2.6.3 Precincts and Community

The design of the places is at its core in the precinct focused community development approach formulated by the NSW Department of Planning and Infrastructure in its North West Rail Link Corridor Strategy. At the regional scale the concept is for 'A Network of Places' with the station at the core of each precinct. This will provide a strong basis for each station precinct to develop with people at the centre; in effect a living spine binding the station precinct to the rail, and via this to the wider metropolitan community.

Ideas encapsulated in such initiatives as the art program are envisaged to promote local community engagement and develop a strong sense of local ownership unique to each location. This is a significant mechanism for people to forge a connection to place based on their precinct and their local station that will develop over time derived from the impetus provided by the construction of the Sydney Metro Northwest - a catalyst to connect communities within and with each other in North Western Sydney.

Centre Typology

The typology of all public places and centres along the corridor is illustrated in Figure 2.20_ Metro Sydney Northwest Place and Centre Typologies.

The civic spaces will identify and characterise each station uniquely with its location. These civic spaces will be:

- A town square (Kellyville, Rouse Hill, Bella Vista)
- A park (Castle Hill)
- A forecourt (Cherrybrook),
- A promenade or public street (Cudgegong Road, Norwest)
- A plaza (Showground).

The layout, character and function of each centre and its essential place are detailed in Section 3 of this Urban Design and Landscape Corridor Plan.

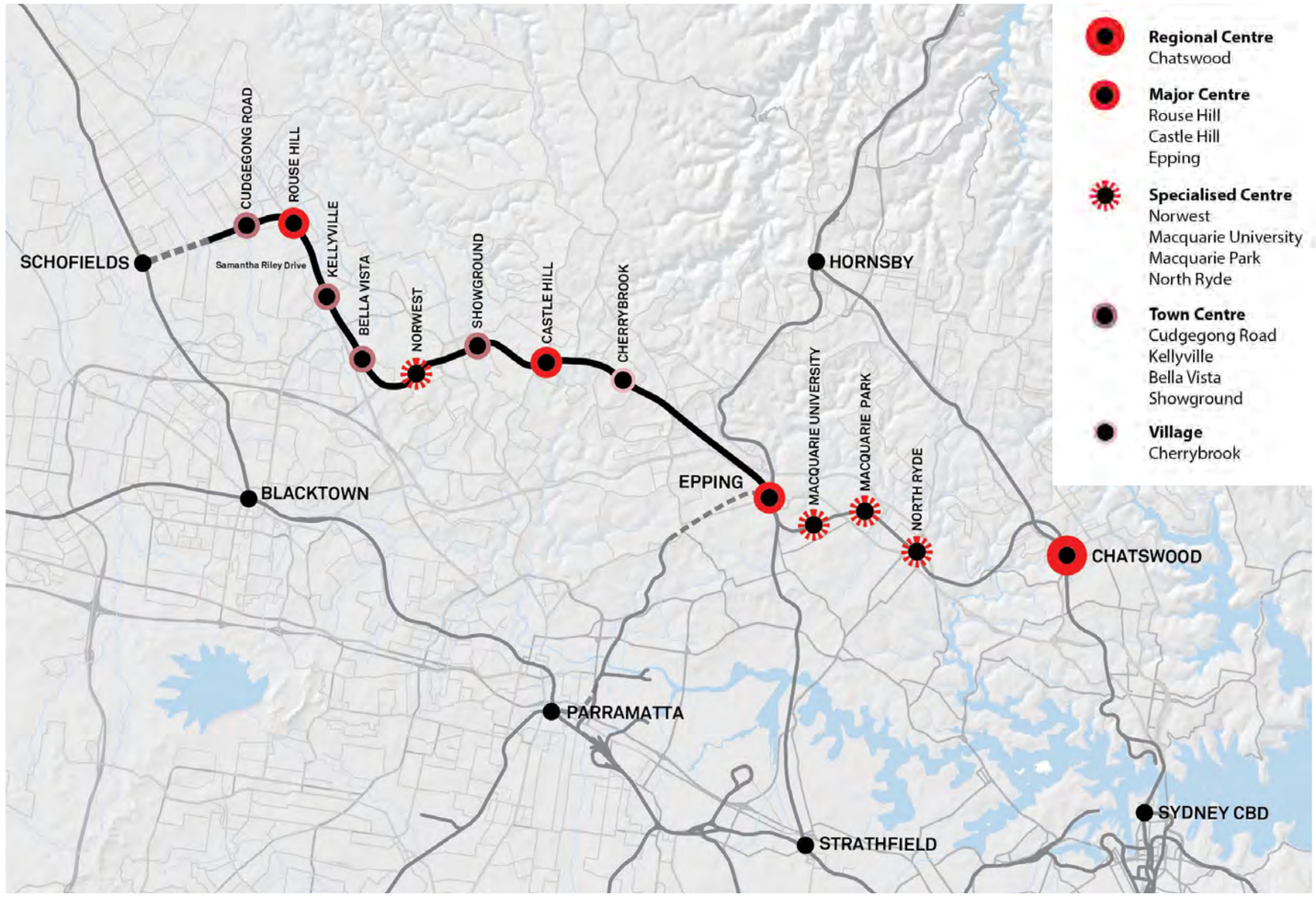


Figure 2.20_Sydney Metro Northwest place and centre typologies. Metro Sydney Northwest Place and Centre Typologies. Source: Tender Document p39 of Volume 2 Part D: Non commercial.

2.6.4 Public Domain

The approach to the design of the public domain is focussed on creating a network of high quality public spaces to encourage efficient, safe and enjoyable journeys to the stations and help support and encourage high quality urban development in the surrounding precincts.

The conceptual approach enables:

- An enjoyable experience for the customer in the public domain with a focus on the journey through the secondary and primary plazas connected to the stations
- Opportunity for the realisation of vibrant multi purpose social hubs to engage locals with their precinct and the wider community
- Public space anchored by the primary plaza that unites the areas around the station and releases space for an integrated urban environment
- ***Light Line Social Square*** public art program to generate social engagement and creative enriching experiences with art as a central theme
- Opportunities for future convenient services for the customer and the public such as a crèche, cafe, community park, community hall, retail or cycle hubs as an example
- Places for rest, respite and play within functional landscaped areas responsive to the seasonal changes and times during the day
- Spaces of varying scale, which provide opportunity for individual to large gatherings.

Station precincts and streets characterised by shady trees from the boulevard scale to the intimate scale. Sustainable water reuse, through swales and rain water storage, has also been carefully integrated with the urban fabric.

Primary circulation pathways between car parks and interchange streets are supported by high quality surface finishes and lighting. Pedestrian connections have been planned to ensure the highest safety standards apply between pedestrian and vehicular traffic.

Figure 2.21_Artist Impression of Bella Vista Station Public Domain Source: Ai3D.

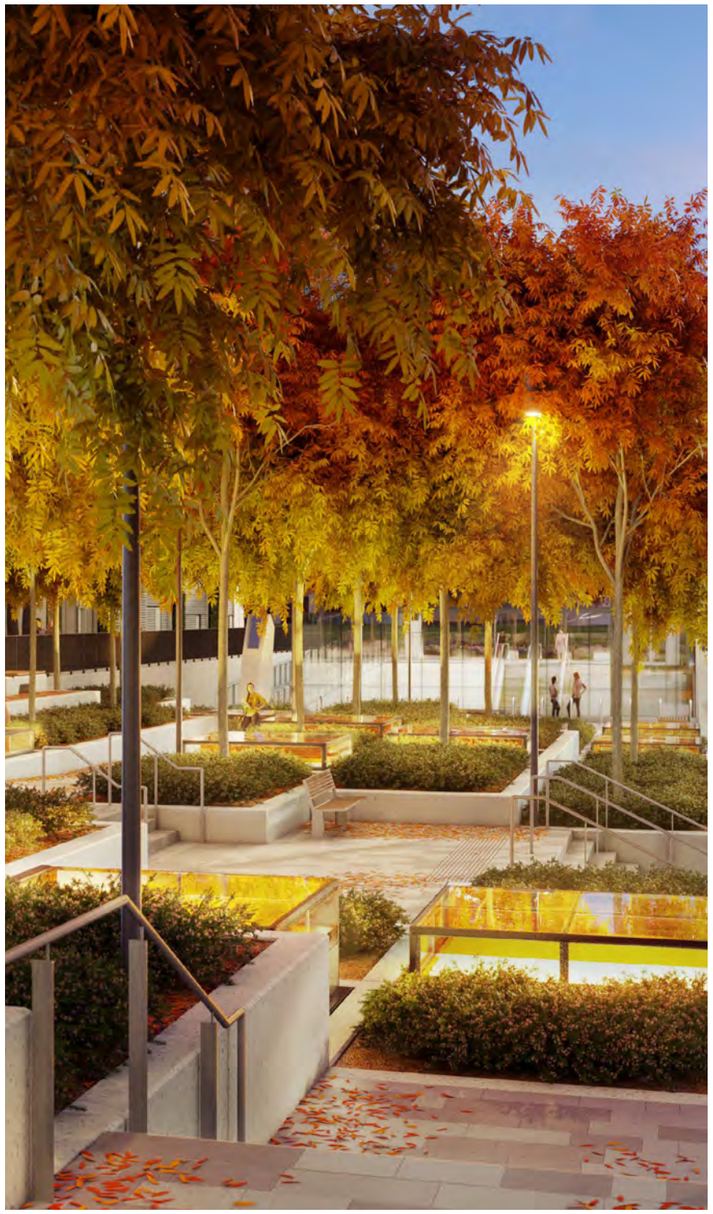


Figure 2.22_Artist Impression of Norwest Station Public Domain Source: Ai3D.

2.6.5 Building Architecture Design Approach

The conceptual approach to the design of the building elements on the project is overviewed in this section. How the conceptual approach has been realised at each precinct is detailed in Section 3 Precinct Plans and the componentry in Section 4 System Wide Components.

Station Design

Sydney Metro Northwest station designs reflect the core functional requirements of rail travel including timeliness, information, ticketing, convenience, accessibility, cleanliness, comfort, safety and security and Station typology.

There will be eight new stations along the Sydney Metro Northwest. The three station types are:

- Cut and Cover: Showground, Norwest and Castle Hill.
- Open Cut: Cherrybrook, Bella Vista and Cudgegong Road.
- Elevated: Kellyville and Rouse Hill.

Refer Figure 2.23_Sydney Metro Northwest Station Typologies.

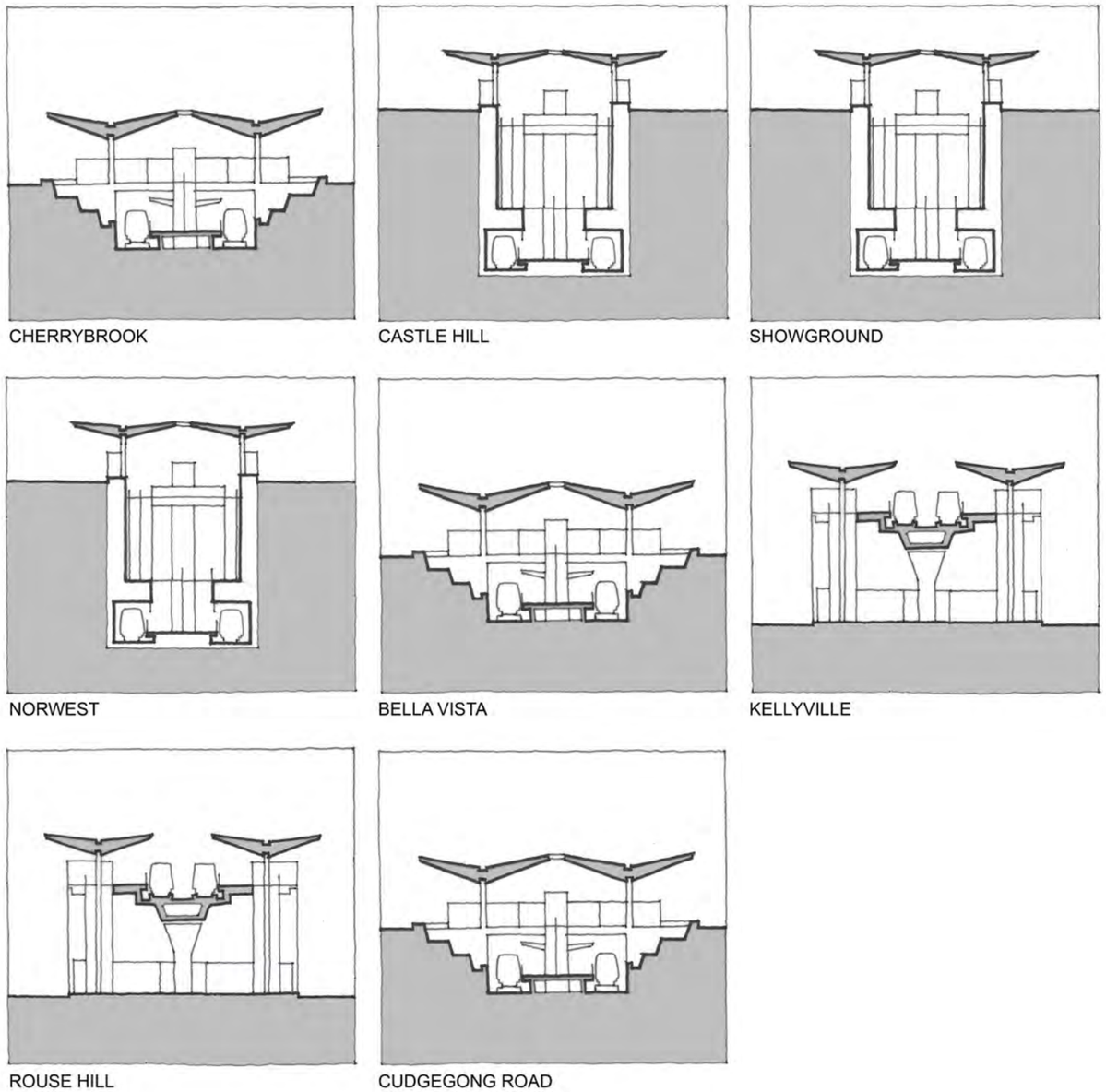


Figure 2.23_Sydney Metro Northwest Station Typologies. Source: HASSELL

Canopy

The station canopies are the most recognisable and distinguishing feature of the station's design. They provide the public face of the transport system, establish a linewide idenitiy, act as clear markers within the community, and demonstrate concern for the comfort and amenity of customers.

There are three primary canopy types, one for each station type, and a suite of smaller configurations to deal with shelter and accommodation in the public domain.

The canopies provide a sensitive response to the spirit of North Western Sydney, using local materials and influences to establish a contemporary character that is appropriate to its time and will define the stations and precincts for future generations.

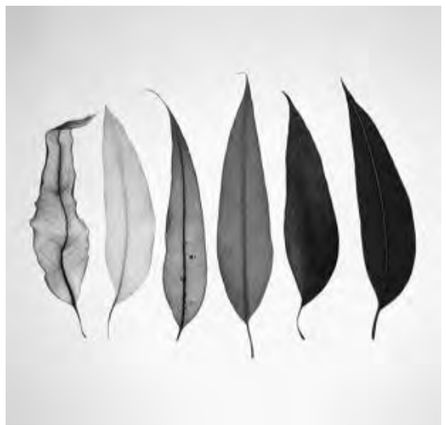
The design response and essence of the concept 'Canopy' will:

- Provide a recognisable form derived from the leaf of a eucalypt, with common geometry and materials for line wide brand and identity
- Shelter, protect and enrich the customer experience
- Filter Sydney's strong light quality to create translucency and a sense of movement
- Capture rainwater for re-use
- Create a strong sense of colour in response to context and seasonal variation
- Ensure structural efficiency is derived from natural structures, such as the compression arch and space frame geometries.

The canopies have a common design language and are:

- Beautiful – places and buildings
- Scalable – providing increased height, width and length
- Generous – providing a substantial physical presence and an uplifting experience for the customer and generous weather protection
- Efficient – they are founded on a simple and rational structural logic
- Sustainable – they will transmit daylight and air movement and capture rainwater for reuse in the station precincts
- Safe – they will enable the highest levels of visual surveillance
- Adaptable – they will support a range of complimentary functions including bicycle storage, future retail concessions, interchange shelter, advertising, public address and wayfinding.

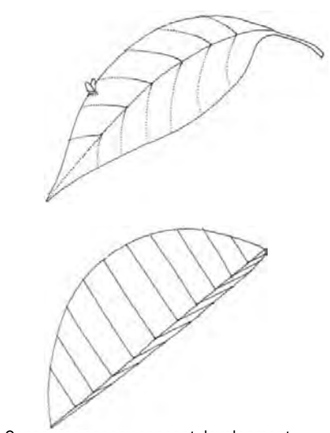
The design approach is specific to North West Sydney; the colours, hues and textures of the station buildings will reflect the colours, hues and textures of the local landscape. This approach promotes a unifying form, and a canopy of consistent geometric profile across the entry and concourse areas at each station.



Inspiration

Conceptual genesis

Local colours, local hues and local textures enrich each place



Concourse canopy concept development

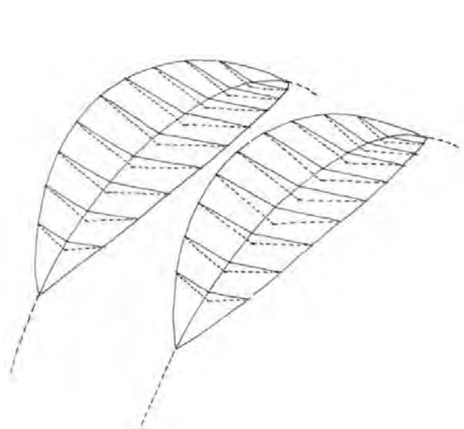


Figure 2.24_Design Development. Source: HASSELL

Plaza

The station precincts are anchored by a network of primary and secondary plazas, which will seamlessly connect station entrances and concourses to the public domain. Plazas will:

- Serve as the prime civic address and unifying space to support a local community 'hub' of activity
- Establish a coherent, integrated and seamless transition for the customers journey from precinct to rail
- Provide unimpeded, safe access from commuter car parking to the station gateline
- Enable a comfortable, safe environment for the dwelling and movement of pedestrians and cyclists
- Accommodate efficient, accessible interchange for pedestrians, cyclists, bus, kiss and ride, taxis and private vehicle users
- Create opportunity for art, cultural use and social hubs.

The design of elements within the plaza areas such as street furniture, interchange shelters and signage are conceived to be integral to a unified design for the station and plaza. The 'Kit of Parts' approach for each element in the plaza will deliver a unified civic identity. This also allows for future flexibility (expansion and contraction) to meet future growth and changed stakeholder expectations.

Concourse

The station concourse is the key customer interface and orientation space within the station environment. Divided into paid and unpaid areas by the ticket gateline. The concourse will be a coherent and welcoming space with the following attributes:

- Intuitive and visually connected wayfinding
- Functionally efficient for uninterrupted circulation and customer focussed operations
- Generously served by natural daylight and ventilation
- Secure and safe with a high level of visibility from external to internal spaces
- Conveniently located amenities including accessible toilets and parents rooms
- High quality durable finishes including timber soffits to the entrance zone of the station canopies to enrich the customer experience and signal the entrance from the precinct to the station environment
- Line wide identity in the station architecture

Vertical Circulation

The stations will be served by a combination of lifts, escalators and/or stairs. The vertical transition from concourse to platform delivers:

- A safe, efficient and comfortable journey at all station types
- Intuitive circulation pathways, particularly the am and pm peak times where contraflow instances are eliminated
- Uniformly distributed platform loading to avoid congestion hot spots along the platform and the vertical transport landing points
- Capacity for expansion of vertical transport, if required, to meet future patronage demand
- Alignment of vertical transport with the distribution of natural daylight from the canopy skylights
- Operational efficiencies by reversing escalator directional flows to respond to alternate am and pm peak demand
- A consistent circulation arrangement to provide a familiar experience for the customer from one station to the next.

The vertical transport for each station typology is designed to meet the functional performance requirements and create a comfortable, safe and enjoyable transition from concourse to platform for the customer.

Platform

The conceptual approach to the design of the station platforms will provide consistently clear, safe and comfortable areas for patrons when boarding and alighting trains.

Island platforms are provided in all stations, with the exception of the elevated stations at Kellyville and Rouse Hill. At Kellyville and Rouse Hill stations side platforms are provided.

The platform designs include the following:

- Uncluttered area to allow for safe movement of customers from concourse to the train allowing for projected patronage demand
- Clear line of sight between the concourse and platform landing areas and from the vertical transport landing points to the end of the platforms
- Maximised visual connection between platforms and precincts to improve customer amenity and provide a secure and safe environment
- Platform 'T' section canopies in the open cut and viaduct stations to provide uninterrupted weather protection from the concourse to the platform edge barriers.
- Clear, legible wayfinding signage including interactive Public Information Displays (PIDs) to enable intuitive decision making for customers throughout the platform and transition areas
- Optimised light distribution including natural daylight along the platforms with centralised canopy skylights in the open cut stations including skylight lanterns over voids in the cut and cover stations
- High quality seating located on the platforms
- High quality floor finishes featuring joint patterns coordinated with furniture and services.

Service Buildings and Traction Substations

Service buildings and traction substations are generally located at each end of the station concourse area to achieve the following:

- Provide operational and energy efficiency such that plant and cabling are positioned in alignment with the rail cable alignments
- Provide safe, serviceable space for maintenance operations for technical personnel and vehicles with emphasis on safety and minimising disruption to public areas
- Minimise impact on the key station public areas such as the primary and secondary plazas, entrance, concourse and public circulation paths
- Be secondary in scale and prominence to the station and community buildings by working with the existing and proposed ground levels to minimise built form height and configuring substations to be concealed from important public view lines
- Adopt a consistent design palette for substations and other station plant incorporating durable finishes arranged into a modular 'Kit of Parts'.

Service buildings and traction substations are serviceable and functional spaces that are accessible for rail personnel, to enable rail operations to continue uninterrupted.

The design for stations and stations precincts provides the public and customers with environments that are not compromised by services buildings or traction substations. A key part of the design strategy is to incorporate public art into the stations precincts.

Commuter Car Parks

The conceptual design of the car parks include the following key features:

- Car park structures integrated into the station precincts urban framework to ensure relative scale and form are appropriate in context with stations and current/future station precinct buildings for improved station prominence and precinct development outcomes
- Safe, unobstructed and convenient access between car parks and station entrances with opportunities for engagement with station precinct activity and high quality landscape outcomes
- Minimal interchange time for customers between the car park and the station entrance
- Consolidated car parks to minimise impact on the station precinct character to enable generous landscape to anchor the urban environment
- Car park entrance driveways located to provide sufficient vehicle queuing capacity including allowance for future entrance canopies, ticket boom gates integrated into the station precinct traffic system
- Car parks designed with simple layouts for intuitive wayfinding to avoid confusion and maximise convenience for customers locating car parks, entrances and exits
- Secure car park entrance lobbies and shafts positioned for easy identification for customers within the stations and station precincts
- Modular facade screens incorporating timber for high quality visual integrity and to preserve natural ventilation

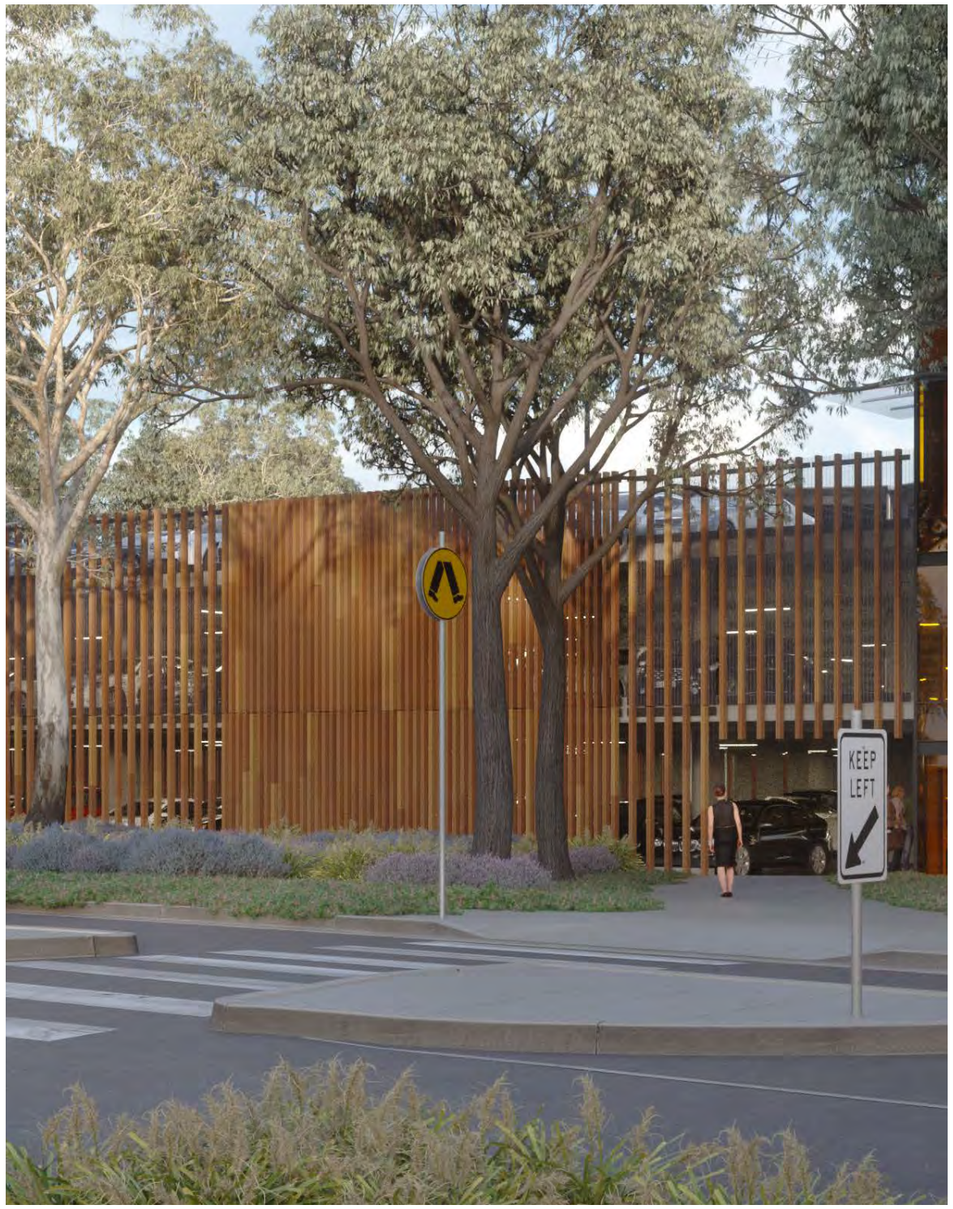


Figure 2.25_Artist Visualisation of Bella Vista Multi Level Car Park. Source: Ai3D

2.7 Environmental and Sustainability Strategy

The majority of environmental impacts associated with the construction of the Sydney Metro Northwest project within the ecosystems traversed by the new rail line will have occurred as part of the Stage 1 works (Design and Construction of Surface and Viaduct Civil Works). These impacts have been assessed and measures for their mitigation described as part of EIS1 and the associated Urban Design and Corridor Landscape Plan (NWRLSVC-ISJ-SVC-PM-PLN-121101). The remaining environmental impacts associated with the Stage 2 works (Stations, Rail Infrastructure and Systems) are considered to be minor.

These have been identified in Chapter 15- Ecology and Chapter 20- Cumulative Impacts of EIS 2. Mitigation measures were identified for:

_ terrestrial flora
_ riparian and aquatic environments
_ groundwater dependent ecosystems.

These are identified in Table 2.2 Ecology Mitigation Measures.

Table 2.2_Ecology Mitigation Measures

No.	Mitigation Measure	Applicable to*
OPERATIONS		
OpE2	Noxious and environmental weeds would be controlled within the operational site boundary.	Within the operational site boundary.
OpE4	The Best Practice Guidelines – Green and Golden Bell Frog Habitat (DECC, 2008) would be followed during operation to protect and maintain any ephemeral breeding habitat for Green and Golden Bell Frog established as a result of the project.	Ephemeral breeding habitat for Green and Golden Bell Frog established as a result of the project.
OpE5	Regular visual inspections would be undertaken of creeks above tunnel sections and underground NWRL infrastructure, during operation, for a time period to be agreed with the NOW. Inspections would target permanent pools and be compared to pre-bore data collected and non-impacted reference sites. In the event that substantial drops in the water level of permanent pools are detected, further investigations would be undertaken to determine the cause. If changes are determined to be caused by, or suspected to be caused by, tunnels, mitigation measures would be discussed with the NOW and implemented as appropriate.	Creeks above tunnels/ NWRL infrastructure
OpE6	To reduce disturbance to bats and nocturnal birds where reasonable and feasible, a range of measures would be undertaken, such as: _ Artificial lighting would be directed to where it is needed and in a downwards orientation to avoid light spillage, Artificial light would be positioned to face away from areas of native vegetation. _ Low-pressure sodium lamps would be used instead of high-pressure sodium or mercury lights. Where mercury lights are used, UV filters would be fitted. _ The brightness of lights would be reduced to as low as legally possible, and in conformance with workplace health and safety standards. _ Amplified speakers would be directed downwards and away from areas of native vegetation	Surface track Stations Stabling facility Service facilities
OpE7	Maintenance of waterway crossings and structures would be undertaken in accordance with relevant guidelines such as Fish and Fauna Friendly Waterway Crossings (Fairfull & Witheridge, 2003) and Fish Passage Requirements of Waterway Crossings (2003).	Waterway crossings and structures
OpE9	The areas identified as 'likely' or 'potential' Groundwater Dependent Ecosystems (GDEs) would be monitored during operations in accordance with the groundwater monitoring plan (refer to Chapter 8 Soils and Groundwater for further details).	'likely' or 'potential' GDEs

No.	Mitigation Measure	Applicable to*
CONSTRUCTION		
E1	The ecological component of the site induction would include information on: _ Sensitivity of surrounding vegetation (particularly threatened vegetation). _ Sensitivity of threatened fauna species (birds and bats). _ Site environmental procedures (vegetation management, sediment and erosion control, protective fencing, weed control). _ Emergency and incident response/ spill management (chemical spills, fire, injured fauna).	All sites[2]
E2	Pre-clearing surveys would be undertaken to identify the presence of: _ Hollow bearing trees and other habitat features _ Threatened flora and fauna.	Street trees which need to be cleared
E6	Trees containing hollows would be felled using "Slow drop" technique (or similar as agreed with OEH). The slow-drop technique involves nudging and shaking the tree, followed by a controlled lowering of the tree to the ground.	Street trees which need to be cleared
E7	Where feasible and reasonable, topsoil and habitat elements (eg logs and felled trees) from sites that have few weed species would be stored and reused onsite.	All sites
E8	Site offices, stockpiles, machinery wash down areas, and plant storage areas would be located outside of any ecologically sensitive areas being retained onsite.	All sites
E9	Fuel (or other chemical) storage would be located outside all riparian zones, and at least 10m from any retained ecologically sensitive areas onsite.	All sites
E10	Construction sites would be revegetated using endemic native plant species where appropriate.	All sites
E12	To prevent establishment or spread of weeds: _ Machinery would be cleaned before entering work sites _ Weeds would be removed from within the mapped native vegetation areas at least 10m from the edge of the construction footprint (where access allows). _ Cleared weed material would be disposed of at a site licensed to receive green waste.	All sites

Source Table 15.6 Ecology Mitigation Measures in Chapter 15 of EIS 2

The focus of the design for the works the corridor and precinct subject of this UDCLP has been to rehabilitate the bushland waterways and associated habitats disturbed by the works to provide the conditions necessary to establish self-sustaining ecosystems. The primary areas of concern are the:

- corridor precincts associated with the Skytrain
- remnant bushland adjacent to station and service facility precincts; and where appropriate
- designated buffer areas adjacent to the project works.

Specific proposals for the areas are described in Section 3 and 4 of this UDCLP.

The design of the stations and associated precincts of the Sydney Metro Northwest project is consistent with the North West Rail Link Sustainability Strategy October 2012 (Refer Figures 2.26 and 2.27).

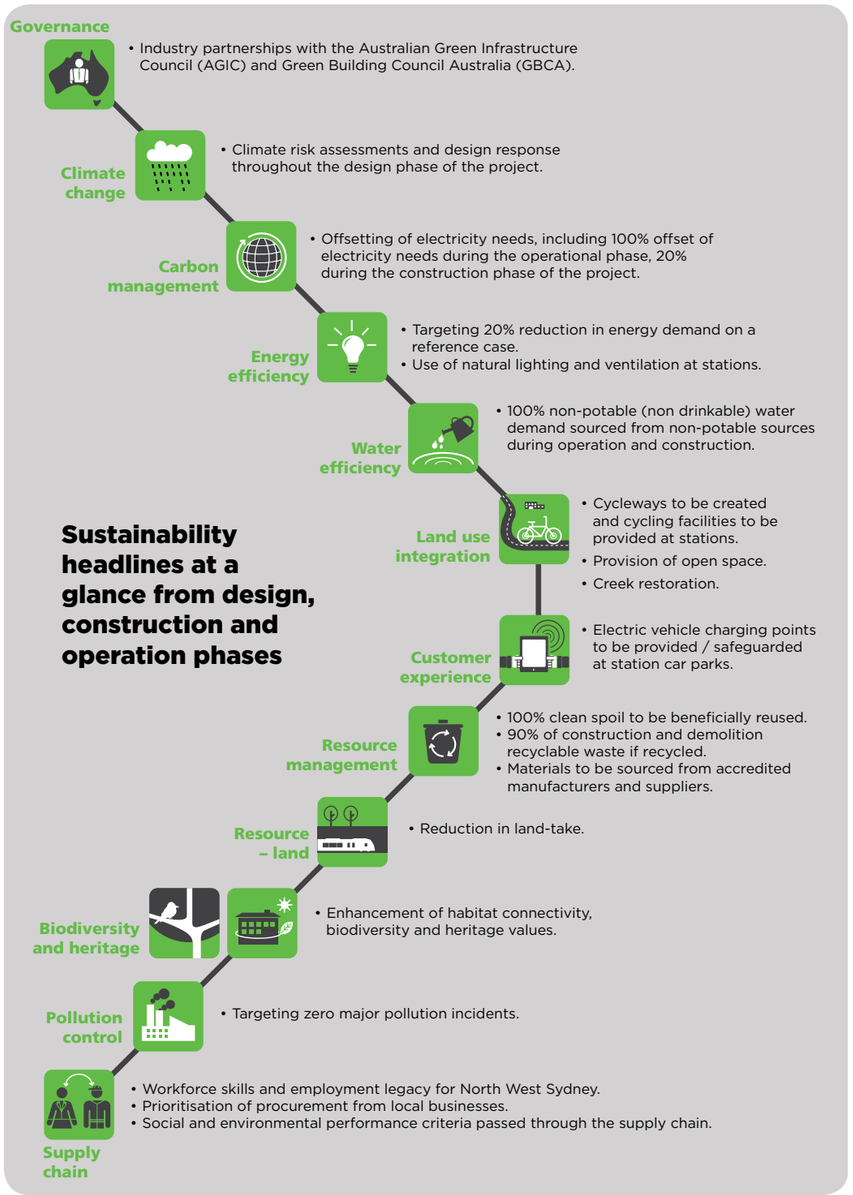


Figure 2.26_Sustainability Headlines. Source: NWRL Sustainability Strategy October 2012

North West Rail Link sustainability theme	North West Rail Link project sustainability objectives
Governance	Demonstrate sustainability leadership within the rail, transport and land use sectors.
Climate change	Be resilient to potential climate change impacts and reduce infrastructure vulnerability.
Carbon management	Improve shift towards lower carbon transport. Reduce operational, construction and embodied carbon emissions. Identify low carbon energy generation and procurement options.
Energy efficiency	Promote energy efficient design and construction, including reducing fuel usage.
Land use integration	Promote liveability and sustainability benefits of urban renewal and consolidation. Optimise community and economic benefit of residual land development. Promote improved public transport patronage by leveraging connectivity and interchange capabilities.
Customer experience	Promote enhanced urban design and passenger comfort.
Community benefit	Enhance community benefits through transport amenity and reliability, healthy living, provide for community safety, ensure community engagement and involvement, provision of public art, accessible design and social inclusion.
Resource – land	Optimise above and below ground land take requirements
Resource – water efficiency	Minimise demand for, and use of potable water, as well as maximise opportunities for water re-use from captured storm water, wastewater and groundwater.
Resource – waste and materials	Reduce materials use and minimise waste through the project life-cycle. Identify materials with lower environmental footprint.
Heritage conservation	Protect and promote local heritage through appropriate design, planning, and management controls.
Biodiversity conservation	Protect and create biodiversity through appropriate planning, management and financial controls.
Pollution control	Reduce sources of pollution and optimise control at source to avoid environmental harm.
Supply chain	Influence contractors, sub-contractors and materials suppliers to adopt sustainable practices in support of the North West Rail Link Environment and Sustainability Policy.

Figure 2.27_Sustainability Themes. Source: NWRL Sustainability Strategy October 2012

2.8 Passenger and Community Safety and Security

The design of the stations and precincts will apply the principles of Crime Prevention Through Environmental Design (CPTED) to the benefit of rail patrons and the community at large. The way CPTED principles have been applied to the design of the public domain and buildings is summarised below.

Natural Surveillance

Natural surveillance will be achieved by arranging physical elements, activities and customers in such a way as to maximise visibility, promote day and night time use, and foster social interaction. This approach includes:

- precinct streets that promote local passing vehicle traffic and free movement of pedestrian and bicycle traffic
- station concourse areas that are open and transparent, and feature clearly designating points of entry and exit, and ticket barriers clear of obstruction and visual obstacles
- clear and direct sight lines between the paid and unpaid concourse
- locating service buildings and concourse pods to allow a high visual connection from precinct streets to platform area
- station layouts where all spaces are within primary visual connection with no public spaces hidden from view- avoidance of hidden recess spaces
- glazed lifts
- security barriers and fences where required are either glazed screens or see through palisade fencing
- all internal and external public places will be well lit including pathways, stairs, entrances/exits, parking areas, ATMs, phone kiosks, interchange areas, play areas, recreation areas and service areas
- use clear stemmed trees and low level ground cover, which will allow uninterrupted ground level views across the public domain
- streets and public spaces activated with ground level uses
- all public spaces illuminated at night
- CCTV at all stations and precincts complement these natural surveillance measures.

Natural Access Control

Clear differentiation between public space and nonpublic space will be achieved by selectively placing entrances and exits, signage, fencing, lighting and landscape to control flow and ensure natural access control occurs. Other control features include:

- shared user path along the corridor, with signs for orientation and information, connected to neighbourhood roads and pathways
- pram ramps, varied paving and lighting to guide pedestrian and cyclist movement
- each station has a prominent and distinguishable entry
- each entry is secured to provide after hours access control to the concourse
- ticketing and customer interface areas are located immediately adjacent to the entry
- toilet entrances have privacy screens or maze walling to avoid the isolation that is produced by an anteroom or double door entry
- way finding and access is simple and intuitive with minimum need for signage
- roofs are not easily accessible
- concourse areas are defined by low level walls around the station box/perimeter with high level cantilevered, laminated safety glass screens to control access
- non-climbable fencing is used to secure non-public areas and service areas.

Natural Territorial Reinforcement

A sense of ownership and pride will be promoted through design at each of the stations and their associated public domain to encourage natural territorial reinforcement.

The station roofs, service buildings, fences, pavements, signs, lighting and landscape are designed as a cohesive suite of elements to express ownership and define public and private space.

The stations, public domain and all landscape areas will be maintained in a clean and healthy condition at all times. Substantial tree planting will be undertaken in adjacent streets and places to enhance amenity and ensure the public domain is attractive, safe and popular.

Other territorial features include:

- clearly designated paid and unpaid areas at stations
- signage at access points
- scheduling activities in common areas increases proper use, attracts more people and increases the perception that these areas are controlled

Station Management

Customer Service Assistants will roam the Stations. A Customer Service Officer will intermittently occupy the Station Management Room.

Wind, Rain and Sun Protection

Protection from wind, rain and sun is provided to ameliorate local weather conditions. These measures include the:

- arrangement of required built form to block prevailing winds
- incorporation of transparent vertical screens at concourse and platform levels and to the vertical transport at elevated stations
- incorporation of roof canopies over the entire concourse area and vertical transport, escalators and stairs to platform level provide enhanced weather protection.

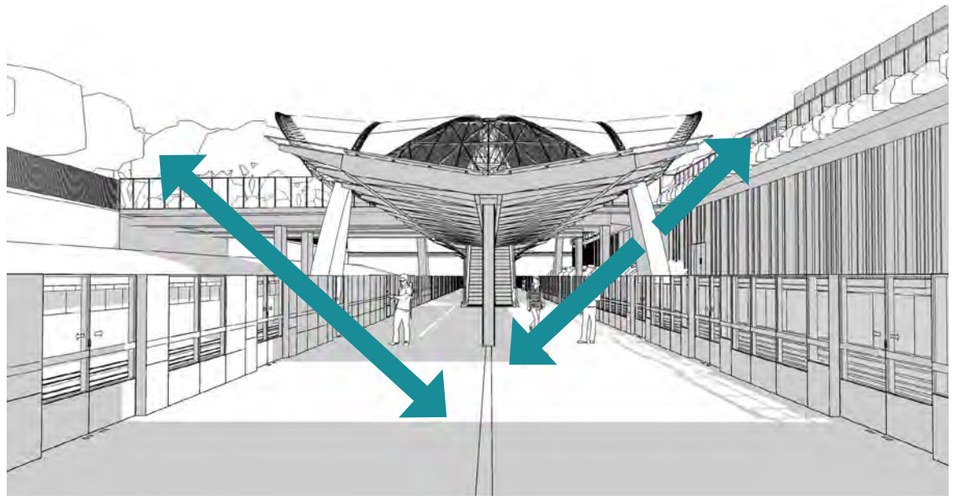


Figure 2.28_Clear Sight Lines from the Station Platform-Bella Vista Station. Source: HASSELL.

2.9 Community Amenity and Privacy

In terms of community amenity the Sydney Metro Northwest will deliver far reaching transport related and other benefits to the people of North West Sydney.

As the first part of Sydney's Rail Future, a customer focused public transport plan to modernise Sydney's rail network and trains, the Sydney Metro Northwest will provide a significant expansion to Sydney's rail network in an area of major future population and jobs growth. The project will be the first part of a new, modern high frequency rail network. The project will provide access to reliable non-road based public transport and be integrated with existing rail and bus networks. In addition the project will provide commuter car parking spaces at dedicated park and ride facilities at Cherrybrook, Showground, Bella Vista, Kellyville and Cudgegong Road stations.

The project will reduce the need to use private cars for travel, in particular along congested road routes into North Sydney and the Sydney CBD.

As well as its transport function the project will be a catalyst for increased urban development activity, particularly in proximity to the stations.

Overall, the following community benefits will be provided.

- Be the first part of Sydney's rapid transit network. The rapid transit network will offer a comfortable, frequent, fast and high capacity rail link between suburban regions and busy inner city areas using single deck trains.
- Rail access for approximately 400,000 residents in the North West to Epping, Macquarie Park, Chatswood, St Leonards, North Sydney, the Sydney CBD and beyond.
- Deliver new rapid transit rail services to existing suburbs in the Hills District as well as future areas of growth planned for the North West.
- Improve travel time reliability compared with bus and private car resulting in significant travel time savings for travel from many areas of the North West area to the Sydney CBD and Macquarie Park.
- Reduced bus congestion in the Sydney CBD in the long term.
- Increased public transport services to the Macquarie University and Macquarie Park area.
- A more sustainable public transport and decreased greenhouse gas emissions.

As well as assisting in the delivery of these keystone project benefits the project's objective is to safeguard and enhance community amenity and privacy at the precinct or local level. The focus of the plan is on mitigating potential adverse impacts associated with the Sydney Metro Northwest and seeking opportunities to improve or enhance the current situation across a range of criteria.

This will be achieved directly via Sydney Metro Northwest project works and by the catalytic effect the Sydney Metro Northwest will have on adjacent areas and precincts.

The details of proposals for specific sites are contained in the relevant precinct plans in Section 3 of this document. The following objectives have been adopted to guide the planning, urban and landscape design of the corridor and associated stations and facilities to achieve community amenity and privacy benefits.

Station and Rail Associated Facilities

- Landscape and building design that enhances the character of the local neighbourhood public domain to promote further urban development within the adjacent area consistent with the aspirations of the North West Rail Link Corridor Strategy
- Energy efficient, climactically responsive building and public domain design (including appropriate solar orientation, shading, cross ventilation, natural lighting and passive cooling techniques etc) to promote user comfort and enjoyment.

Housing Diversity and Affordability

- Siting and configuring stations and associated rail facilities to help deliver housing choice and diversity to meet the needs of the community through a mix of densities, types and levels of affordability, to cater for a range of lifestyles and life-cycle needs

Employment Opportunities

- Siting and configuring stations and associated rail facilities to help facilitate a wide range of accessible employment opportunities within the surrounding precinct

Convenient Access

- Providing effective, efficient, safe and integrated access arrangements at stations for all users' amenity irrespective of disability
- Providing convenient connections to other transport modes at stations
- Identifing opportunities within the corridor to contribute to improvements to links between adjacent centres and the neighbourhoods they serve

Figure 2.29_Artist Visualisation of Bella Vista Station Entry.
Source: Ai3D.

Environmental Amenity

- Identifying ways in which the construction can help improve the environmental systems and community green space networks along the route it traverses
- Retaining and constructing additional wetlands
- Retaining and extending remnant natural vegetation and areas of high habitat value along the route traversed by the Sydney Metro Northwest
- Reinforcing existing ecological corridors through the linear attributes inherent in the project
- Incorporating existing natural features into the landscape design to assist in creating neighbourhood identity and for wayfinding benefits
- Applying best practice erosion and sediment control techniques
- Identifying waste minimisation and recycling opportunities

Community Facilities

- Identifying future community facility locations that can be incorporated into the corridor and station precincts that will help promote community well-being

Natural and Cultural Values

- Seeking opportunities to conserve and interpret important local natural and cultural values for the educational and heritage benefits this can deliver to the community
- Contributing to the enhancement of natural environmental processes in the surrounding areas through sensitive design of storm water and water quality facilities and planting works

Visual Amenity

- Avoiding siting permanently occupied or frequently used facilities overlooking adjacent residential, commercial, educational areas so that users privacy is ensured
- Planting trees along the corridor to help improve the rail users' journey experience
- Plant appropriate vegetation for the privacy of adjacent residents especially adjacent to the lengths of the route where trains are stationary or travelling slowly
- Planting trees and shrubs around stations and along the corridor to improve the comfort of users and their enjoyment of the public domain

Noise

- Designing facilities to achieve the relevant acceptable noise levels in adjacent areas. Where required, use well designed noise attenuation barriers sympathetic to the landscape and built form character of the adjacent area

Safety

- Designing the elements of the buildings and public domain in accordance with CPTED principles and relevant safety standards

Figure 2.30_Artist Visualisation of Cherrybrook Station. Source: Ai3D.

2.10 Stakeholder Consultation Strategy

An extensive program of stakeholder consultation has occurred over the last 14 years on the provision of a rail link to the north west, as part of the engagement strategy implemented by the NSW Government and its agencies. The stakeholder engagement program has embraced both the planning and delivery phases of the project, the main features of which are summarised below.

Planning Phase Consultation Summary

The first consultation occurred in 2002 with the community, local business and industry groups.

TfNSW has taken a proactive approach to consulting the community from April 2011 when the NSW Government announced its intention to proceed with the NWRL. Since that time the following activities have been undertaken:

- A project Community Information Centre at Castle Hill opened (June 2011)
- Implementing an information/feedback line and an interactive website
- Local newspaper advertising to advise of Information Sessions and to provide Project Updates
- Consultation about the Project Overview Report (July 2011)
- Place Managers appointed to liaise with residents, businesses and community organisations (October 2011)
- Ongoing consultation following Ministerial announcement of the project in December 2011
- An interactive Industry engagement process has been ongoing since December 2011
- Consultation throughout the exhibition of the Environmental Impact Statement for Major Civil Construction Works (EIS 1) April 2012
- Public submissions received during exhibition and following exhibition of EIS 1 and the publication of a Submissions Report responding to the issues raised, July 2012
- Consultation throughout the exhibition of the Environmental Impact Statement for Stations, Rail Infrastructure and Systems (EIS 2) December 2012
- Public submissions received during exhibition and following exhibition of EIS 2 and the publication of a Submissions Report responding to the issues raised (March 2013)

Delivery Phase Consultation

TfNSW has continued to engage with government agencies, local councils, industry, key stakeholders and the community throughout the delivery phase of the project.

Overarching Stakeholder and Community Involvement Plan (OSCIP)

TfNSW's on going stakeholder engagement has been undertaken in accordance with SCL-02 Overarching Stakerholder and Community Involvement Plan (OSCIP) prepared in July 2013. The OSCIP has been prepared to guide the Sydney Metro Northwest projects approach to stakeholder liaison during the construction of the project. This plan has been developed in line with the relevant Ministers Conditions of Approval and forms part of the Sydney Metro Northwest Stakeholder and Community Liaison Management System.

The OSCIP guides the project's interactions with stakeholders and the community and outlines the:

- Approach, objectives, principals, and tools to be used
- Team structure, roles and responsibilities
- Communication protocols and procedures to be followed
- Key stakeholders
- Implementation Plans to be developed.

The OSCIP has been used to guide the development of the Community Liaison Implementation Plans (CLIP) prepared by the Sydney Metro Northwest team and the relevant contractors, which are to contain the following as required:

- Site Specific Stakeholder and Community Involvement Plans
- Business Management Plans.

Community Liaison Implementation Plan

Consistent with the requirements of the OSCIP, a Community Liaison Implementation Plan (CLIP) has been prepared.

The CLIP, prepared in April 2015, outlines the stakeholder and community liaison management arrangements by which the Operations, Trains and Systems Public Private Partnership (OTS PPP) component of the Sydney Metro Northwest Project is being delivered. The relationship of the various engagement plans for the delivery phase is illustrated in Figure 2.32_ Relationship of Sydney Metro Northwest Project Community Engagement Plans.

Approach

The aim throughout the design and delivery of the project is to minimise disruption and build long-term relationships generating support for the introduction and operation of the Sydney Metro Northwest.

The consultation activities with stakeholders and the community have been coordinated to maximise participation and understanding and leave a positive legacy for the community by being:

- Proactive –identifying and planning for possible community impact and opportunity in advance. Understanding and involving the right stakeholders in the process
- Respectful and responsive –listening and acknowledging stakeholder concerns and engaging in a manner that fosters mutual respect and trust
- Innovative –consistently seeking new ways of doing things, combined with the proven methods of communication such a newsletters, doorknocking and neighbourhood meetings
- Upfront, open and honest –providing clear and accurate information that responds to concerns, views and expectations. Using communication and consultative tools that match stakeholder needs with 'no surprises'
- Focused on sustainable outcomes – looking for opportunities during community discussions, seeking mutually beneficial outcomes, sustainable outcomes, employment outcomes, and community legacy outcomes.

Strategy

The CLIP has been developed to achieve the key community and stakeholder outcomes for the project reflecting experience and learnings from other major projects.

Community involvement and participation has been encouraged by tailoring communications and the tools it uses to the requirements of individual stakeholders and their circumstances.

The overall approach to consultation is outlined in this section and its application to specific stakeholders and groups is included in the stakeholder analysis in Section 4 of the Community Liaison Implementation Plan (CLIP).

There is already established a number of communication channels, which provide ready access to information and contact with the Sydney Metro Northwest project team. These channels were established by TfNSW and generally provide information such as project progress, significant milestones and construction activities, as well as the opportunity to provide feedback via contact information and consultation forums.

The community and stakeholder engagement strategy supplements the communication strategies, channels and tools employed by TfNSW with it's own suite of strategies and tools as described in Section 3 of the CLIP.

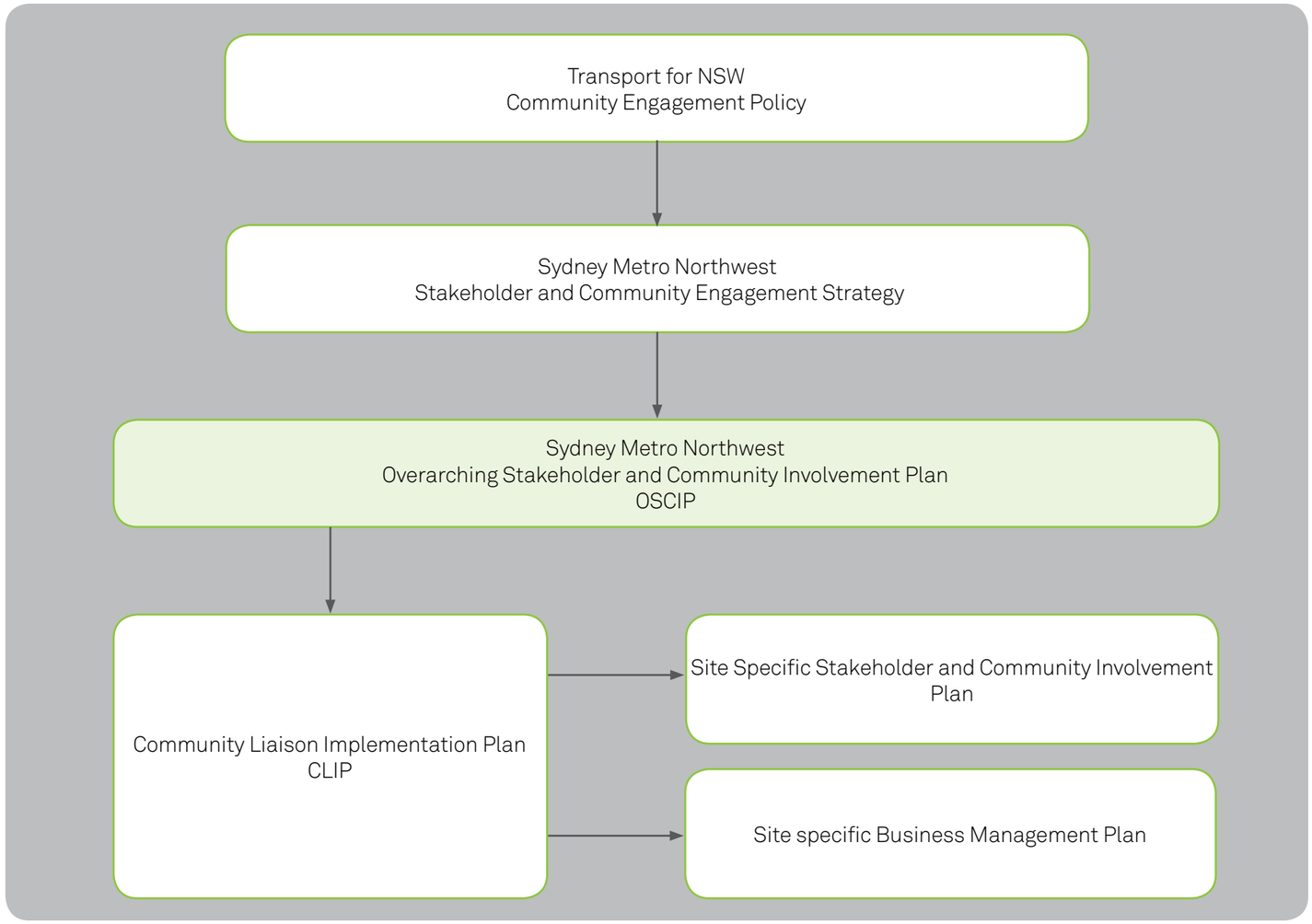


Figure 2.31_Relationship of Sydney Metro Northwest Project Community Engagement Plans.

2.11 Visual Impact Strategy (Condition C27)

Visual impact assessments have been undertaken at various phases of the Sydney Metro Northwest project. As part of the Minister's Approval for the stations, rail infrastructure and systems works, Condition 27 required the Proponent to prepare and implement a Visual Impact Strategy in consultation with the Department of Planning and Infrastructure and the New South Wales Heritage Council, to detail and minimise visual impacts of the proposals on heritage items. These include Glenhope, Inala School, Castle Hill Showground, Mungerie House and the former Swann Inn (White Hart Inn) as well as the rehabilitation of land associated with works. Under Condition 44 of the Minister's approval the recommendations of the Visual Impact Strategy were to be considered in the urban, landscape and architectural design of the works for the stations, rail infrastructure and systems as relevantly covered in this Urban Design and Landscape Corridor Plan (UDCLP).

Key recent studies that have informed the urban, landscape and architectural design of the stations and rail infrastructure covered by this UDLCP are as follows.

- Environmental Impact Statement for Stations, Rail Infrastructure and Systems (EIS 2) Chapter 16 Visual Amenity, December 2012. This report dealt with the visual interactions and impacts of the proposals down to the neighbourhood and local scales along the length of the route. This study has informed the urban, landscape and architectural design of the stations and the rail infrastructure covered by this UDCLP.
- North West Rail Link Visual Impact Strategy for Heritage Properties Report (November 2015), which provided detailed assessment and recommendations for Glenhope, Inala School, Castle Hill Showground and Mungerie House.
- Visual Impact Studies for Mungerie House and the former Swann Inn were prepared under the Surface and Viaduct Civil Works (SVC) package ie. EIS 1. This work was referred to in the UDCLP prepared for the North West Rail Link Design and Construction of the Viaduct Civil Works Package. It is only addressed in this UDCLP to the extent that the recommendations effect the design work carried out under the stations and the rail infrastructure works package i.e. the works which are the subject of this UDCLP.

2.11.1 EIS 2 Visual Amenity Study

The tables on the following page summarise the range of visual impacts identified in EIS 2 for each location and measures required to mitagate impacts during the operation and construction phases of the project, which have been considered in the project urban, landscape and architectural design.

2.11.2 North West Rail Link Visual Impact Strategy for Heritage Properties

The North West Rail Link Visual Impact Strategy for Heritage Properties Report contained recommendations for the four sites of Glenhope, Inala School, Castle Hill Showground and Mungerie House. These are summarised below and have been taken into consideration when developing the designs for these locations. The recommended strategies from the report and how these have been accomodated in the design of the relevant station precinct are described in Section 3 of this UDCLP. Further detail on the recommendations is contained within the relevant sections on each of the heritage sites in the North West Rail Link Visual Impact Strategy for Heritage Properties Report.

Glenhope - Cherrybrook Precinct

Overall, there would be a high impact to views from Glenhope both during the day and night prior to the planned tree planting maturing between the multistorey car park and other parts of the station. Once the trees reach a mature height of approximately 15-20m, then the extent of impact would substantially reduce and be of a more acceptable and moderate impact level.

However, it is recommended that strategies are required to reduce the level of impact by improving the visual buffer between Glenhope and the multi storey car park.

Inala School - Cherrybrook Precinct

Overall, there would be a minor impact to views from Inala School during the day, with night time impacts of less concern. The main impact would be to the school entry where there would be views of the multistorey car park initially, depending on the timing of future development in the intervening area. Once the planned trees alongside Franklin Road reach a mature height of approximately 15-20m, then the extent of impact would reduce.

Castle Hill Showground - Showground Precinct

Overall, there would be a minor impact to Castle Hill Showground largely due to the planned redevelopment of the site as a 'leisure precinct' and the visual separation between the showground and Showground Station.

Mungerie House - Skytrain Corridor Precinct

Overall, there would be a moderate impact to views from Mungerie House both during the day and night prior to the planned tree planting maturing along the Sydney Metro Northwest corridor and Rouse Hill Station. Preventing views of the skytrain and station, as much as possible, and the reinstatement of Mungerie House's former carriageway, will go some way towards mitigating visual impacts. However, additional landscape planting within the frontage of the Mungerie House property would mitigate impacts further and is considered a reasonable response.

The measures incorporated into the design for the various sites are discussed where relevant in Section 3 of this UDCLP.

Table 2.3_Summary of Visual Effects

	Visual Impact During Stage 2 Construction	Visual Impact During Operation	Visual Impact at Night
Epping Services	Negligible to Moderate Adverse	Negligible to Moderate Adverse	Negligible
Cheltenham Services	Negligible to Moderate Adverse	Negligible to Minor Adverse	Minor Adverse
Cherrybrook Station	Negligible to Minor Adverse	Negligible to Moderate Adverse	Minor Adverse to Moderate Adverse
Castle Hill Station	Minor Adverse to Moderate Adverse	Minor Adverse to Moderate Adverse	Minor Adverse
Showground Station	Minor Adverse to High Adverse	Minor Adverse to High Adverse	Moderate Adverse
Norwest Station	Negligible to Minor Adverse	Negligible to Minor Adverse	Negligible to Minor Adverse
Bella Vista Station	Negligible to Minor Adverse	Negligible to Minor	Adverse Negligible
Balmoral Road & Memorial Ave	Negligible to Moderate Adverse	Negligible to Moderate Adverse	Minor Adverse
Memorial Avenue to Kellyville Station	Negligible to Moderate Adverse	Negligible to Moderate Adverse	Moderate Adverse
Samantha Riley Drive to Windsor Road & Old Windsor Road to White Hart Drive	Negligible to High Adverse	Negligible to High Adverse	Negligible
Rouse Hill Station	Negligible to Minor Adverse	Minor Beneficial to Minor Adverse	Negligible
Windsor Road Viaduct to Cudgegong Road	Negligible to Minor Adverse	Negligible to Minor Adverse	Negligible
Cudgegong Road Station	Negligible to Moderate Adverse	Negligible to Moderate Adverse	Moderate Adverse
Tallawong Stabling Yard	Negligible to High Adverse	Negligible to High Adverse	Moderate Adverse

Source: Environmental Impact Statement for Stations, Rail Infrastructure and Systems (EIS 2) Chapter 16 Visual Amenity, December 2012.

Table 2.4_Mitigation Measures Operation

No.	Mitigation Measures	Applicable sites*
OpV1	High quality landscape and urban treatments would be used in and around stations.	Stations.
OpV2	Cut–off and directed lighting would be used to ensure glare and light spill on surrounding existing and future residents are minimised.	All
OpV3	The colour and materials of service facility buildings would be selected to blend into adjacent bushland setting.	Service facilities
OpV4	Landform would be used to conceal buildings where reasonable and feasible	Stations and service facilities
OpV5	Street tree planting would be used to visually soften roads and car parking areas.	All
OpV6	Large specimen trees would be incorporated into the plaza at Castle Hill to create an immediate softening effect.	Castle Hill Station.
OpV7	The viaduct between Rouse Hill and Cudgegong Station would be treated to maximise visual integration with surrounding landscape in views from Rouse Hill House. This may include the use of dark colours, landform mounding and buffer planting.	Viaduct
OpV8	Where noise walls are proposed, potential visual impacts would be reduced through high quality urban design treatments developed in consultation with adjacent property owners.	All
OpV9	Earth mounding would be used as appropriate to improve the effectiveness of buffer planting areas where space permits and as appropriate, particularly where significant vegetation would be lost.	All
OpV10	The design and ongoing maintenance of the project would adopt CPTED principles, including the maintenance of unobstructed views into and outside of underpasses, effective drainage and ventilation, wide corridors and appropriate lighting.	All

Table2.5_Mitigation Measures Construction

No.	Mitigation Measures	Applicable sites*
V1	Existing vegetation around the perimeter of the construction sites would be retained where feasible and reasonable to act as a visual screen.	1 – 17
V2	Cut-off and directed lighting would be used to ensure glare and light trespass are minimised.	1 – 17
V3	Where feasible and reasonable the elements within construction sites would be located to minimise visual impact, eg setting particular equipment/structures back from the site boundaries to minimise their visual impact.	1 – 17
V4	Regular maintenance of site hoarding and perimeter site areas would be undertaken, including the prompt removal of graffiti.	1 – 17
V5	Visual mitigation would be implemented as soon as feasible and reasonable, and remain for the duration of the construction period.	1 – 17
V6	Monitoring of the effectiveness of mitigation measures would be undertaken by the relevant construction contractor. This would primarily include regular visual inspection of the condition of the various measures.	1 – 17
V7	The colour and materials of acoustic sheds at selected sites would be selected to blend into adjacent bushland or rural setting.	1 – 4 and 8
V8	The design of acoustic sheds as visual features would be considered where there is limited opportunity to make them recede.	5 and 8
V9	Designing hoarding as a feature would be considered at appropriate locations. This may include artworks or project information. These would be installed as early as feasible and reasonable in the construction process.	1, 4, 6 – 8 and 14
V10	Hoardings would be designed to visually recede in more rural or bushland settings.	3 – 5, 9 – 13 and 15 – 17

Site 1 - Epping Services Facility, Site 3 - Cheltenham Services Facility, Site 4 - Cherrybrook \Station, Site 5 - Castle Hill Station, Site 6 – Showground Station, Site 7 - Norwest Station, Site 8 - Bella Vista Station, Site 9 - Balmoral Road, Site 10 - Memorial Avenue, Site 11 - Kellyville Station, Site 12 - Samantha Riley Drive to Windsor Road, Site 13 - Old Windsor Road to White Hart Drive, Site 14 - Rouse Hill Station, Site 15 - Windsor Road Viaduct, Site 16 - Windsor Road Viaduct to Cudgegong Road, Site 17 - Cudgegong Road Station and Tallawong Stabling Facility, and Tunnels

2.12 Heritage Interpretation

Approach

Building on work documented in the North West Rail Link EIS (EIS2), Technical Papers on European and Indigenous Heritage (March 2012), TfNSW commissioned archaeological investigations of designated sites along the Sydney Metro Northwest corridor. These investigations took place throughout 2013/14 and their interim findings documented in reports prepared by:

- Kelleher Nightingale Consulting Pty Ltd (Indigenous heritage)
- EMGA Mitchell McLennan Pty Ltd (European heritage).

While the documentation of findings of archaeological investigations is ongoing and will be completed in due course, the consultants were requested to identify ways information about Indigenous and European heritage could be interpreted as part of the Sydney Metro Northwest project works in the following reports:

- North West Rail Link Aboriginal Archaeological and Cultural Heritage Interpretation Options,November 2013
- North West Rail Link European Heritage Interpretation Strategy Final Draft Discussion paper December 2013

It is the interpretive aspects of heritage that are of relevance to this UDCLP.

Objectives

The objectives informing the heritage interpretation strategy of the Sydney Metro Northwest sites are to:

- Increase public awareness and understanding of the historical and Aboriginal heritage of the northwest, with particular focus on the stories uncovered during archaeological excavations and research for the project
- Disseminate the information gathered during the historical assessment of each of the sites in such a way that it is accessible to the public and researchers alike
- Provide an enjoyable and informative space for the public to understand and experience their heritage
- Create a narrative that joins each project site and illustrates the individual and collective contribution that all the sites made to the growth of the colony and now to northwest Sydney
- Create opportunities for continuing interpretation of the project sites
- Create links between project sites and heritage sites in the northwest and Sydney regions to further our understanding of the past

The proposals for project wide and specific site heritage interpretation are discussed in Section 4.10 of this UDCLP. Proposals for each precinct are outlined in Section 3.2.5 of this UDCLP.

Figure 2.32_ Artists Impression White Hart Inn. (circa 1840s) I. Golka 2014 Source: TfNSW White Hart Inn Brochure

Figure 2.33_Mungerie House. Source: Weekend Notes.