Detailed requirements & benchmarks

This section outlines element-based detailed requirements and qualitative benchmarks that apply to the whole project to ensure a consistent and high quality corridor-wide approach.

The **detailed requirements** provide performance requirements for the project elements. They communicate the outcomes required to achieve the urban design principles and objectives, and provide the basis for which proposals will be informed, evaluated and delivered.

The **qualitative benchmarks** provide a series of images that illustrate the minimum standard of design quality expected for project elements, drawn from relevant precedent projects. The qualitative benchmarks provide a reference to illustrate the level of quality required in meeting the measures. They are not intended as benchmarks in terms of whole-of-project solutions, but to demonstrate the required quality in terms of conceptual and detailed design integration, innovation and detailed resolution, as annotated on each image.

The detailed requirements and qualitative benchmarks together identify and illustrate the level of quality expected, and requirements against which proposals will be evaluated. A successful design must adequately meet the relevant detailed requirements to achieve a high quality outcome for the project, as well as mitigate and manage negative impacts on the community during the construction of North East Link.


7

7.1 Element-based requirements & qualitative benchmarks

1. Multi-span bridges

FIGURE 1 Demonstrates: well considered pier forms integrated with super structure, providing clear visual permeability across the ground plane. South Road Superway, Adelaide. *Design: Wood Marsh, Image: GHD*

FIGURE 2 Demonstrates: well considered multi span steel trough bridge with articulated piers and integral crosshead. M80 Ring Road, Melbourne. *Design: Peter Elliott and VicRoads, Photography: John Gollings*

FIGURE 3 Demonstrates: continuous / smooth bridge underside and elegant soffit line. Western Ring Road, Melbourne. *Image: VicRoads*

1.1 Viaduct design

Viaducts (continuous multi-span bridges) and ramps are well designed and well proportioned to complement the surrounding area and appropriately address sensitive interfaces.

Viaduct profile and design employ a high quality aesthetic when viewed from and to the structure, and are designed to minimise visual bulk.

Abrupt changes of size and depth of structures is avoided and transitions are smooth.

Structural solutions are durable and avoid the need for cladding.

1.2 Integration

New elements such as elevated roads and ramps are integrated well with connected structures and/or other built elements, the surrounding land form, local context and road network.

Any widening of existing structures are carefully integrated with existing structures to create a cohesive design. Widened structures shall match with existing in size, shape and structural form.

Where bridges are duplicated, new soffit lines do not protrude below existing soffit lines and match existing profile.

Superstructure, piers, beams, barriers, railings, associated furniture, deck, abutment and feature lighting are carefully integrated together to provide a high quality and durable design solution for all users above and below the structure.

Opportunities are maximised to structurally integrate pier cross heads into the bridge and viaduct superstructure.

FIGURE 4 Demonstrates: Continuous / smooth bridge underside and soffit line. Western Freeway, Warrenheip. *Image: VicRoads*

FIGURE 5 Demonstrates: a continuous and streamlined pier and box girder bridge structure design. *Image: VicRoads*

1.3 Minimising impacts

Elevated roads and structures are designed with minimal visual bulk. The design of these structures is to minimise overshadowing of residential properties, impacts on the use of nearby areas (including through generation of noise and disruption of access), and visual impacts from sensitive viewpoints.

The visual impact of the elevated roads and structures on road users is also minimised.

1.4 Visual clutter

Visual clutter is avoided and the number of piers are minimised.

Piers and towers are located to avoid the need for additional structures (such as protection barriers). Where pier protection barriers are unavoidable, reduce the scale and carefully integrate with the bridge design.

Elements such as the edge of the deck, drainage pipes, services and ducts are concealed from view.

1.5 Passive surveillance

Where there is access below structures, passive surveillance is maximised to deter undesirable behaviour.

Materials, textures and finishes are used to deter graffiti.

Solar access is maximised to spaces beneath the structure.

2. Road bridges

FIGURE 6 Demonstrates: an elegant structural solution that is timeless in design. Eastern Freeway, Melbourne. *Image: GHD*

FIGURE 7 Demonstrates: a solution to abutment design that assists in creating a family of bridges. Peninsula Link Melbourne. *Design: ARM Architecture, Image: Southern Way*

2.1 Bridge design

All new bridges continue the form of the existing Eastern Freeway bridges. New road bridges and modifications to existing bridges are well designed, complement the surrounding area and appropriately address sensitive interfaces.

Bridges are designed to a high quality standard, to minimise visual bulk, and to be visually pleasing when viewed from and to the structure.

The overall structure and the various parts of the bridge structure, are geometrically proportioned and have a harmonious relationship.

Structural solutions are durable and avoid the need for cladding.

New piers match existing pier shape, angle and proportion in both directions.

Base of bridge beams match the existing beams in profile.

2.2 Identity

Sets of bridges within a corridor visually complement one another. There is a clear relationship between bridges, with a consistency of bridge elements demonstrated along the length of the project.

2.3 Integration

New bridges and modifications to existing bridges are well integrated with any connected structures or other built elements, the surrounding land form, local context and road network.

Superstructure, piers, beams, barriers, railings, associated furniture, deck, abutment and feature lighting are carefully integrated together to provide a high quality design solution for all users above and below the structure.

Opportunities are maximised to structurally integrate pier cross heads into the bridge superstructure.

2.4 Views

Scenic views and vistas seen from bridges are maximised for road users and pedestrians.

FIGURE 8 Demonstrates: a sleek and elegant road bridge design. Eastern Freeway, Melbourne. *Image: VicRoads*

FIGURE 9 Demonstrates: a well designed substructure, integrated pier / details and appropriate integration of safety barriers. Western Ring Road, Hume. *Image: VicRoads*

FIGURE 10 Demonstrates: an elegant road over cut. Remembrance Drive, Ballarat. *Client/Owner: VicRoads, Design Team: OCULUS, Paul Thompson; Michael Taffe, John Holland Group, Photography: John Gollings*

2.5 Minimising impacts

Road bridges are designed to minimal height and width to reduce landscape and visual impacts and overshadowing of residential properties and other sensitive land uses.

The visual impact of the bridge structure on road users is minimised.

2.6 Visual clutter

Visual clutter is avoided and the number of piers are minimised.

Piers and towers are located to avoid the need for additional structures (such as protection barriers). Where pier protection barriers are unavoidable, reduce the scale and carefully integrate with the bridge design.

Elements such as the edge of the deck, drainage pipes, services and ducts are concealed from view.

2.7 Passive surveillance

Where there is public access below structures, passive surveillance is maximised to deter undesirable behaviour.

Materials, textures and finishes are used effectively to deter graffiti.

Solar access is maximised to spaces beneath the structure.

2.8 Retrofitting

New built elements (e.g. throw screens, traffic barriers around piers, structures, fencing, walls etc.) on existing road bridges are bespoke, innovative and designed to complement the original form and aesthetic qualities.

2.9 Signage on bridges

Advertising and road signage are not located on bridges.

Intelligent Transport System (ITS) signage on bridges is avoided or well integrated into the bridge design.

3. Land bridges

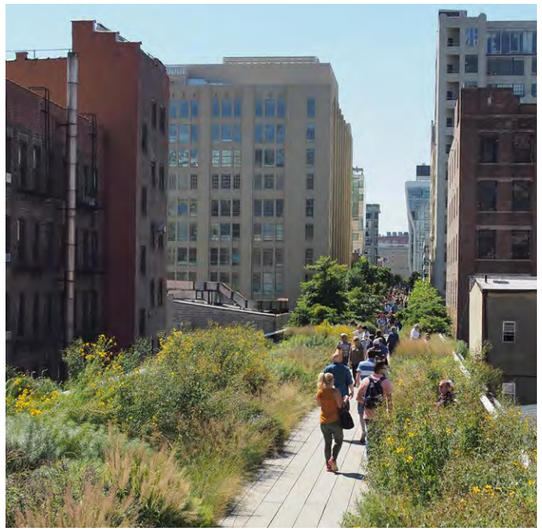


FIGURE 11 Demonstrates: a landscape design that provides an enhanced user experience. High Line, New York.
Design: James Corner Field Operations (Project Lead), Diller Scofidio + Renfro, and Piet Oudolf, Image: GHD

FIGURE 12 Demonstrates: unique and well envisaged public open space above a highway. Freeway Park, Seattle.
Design: Lawrence Halprin and Angela Danadjieva, Photography: Matt Hagen

3.1 Community connections

Land bridges (land supported by bridge structures that cross over a road in trench) maintain and/or enhance connections for pedestrians and cyclists across the road corridor.

3.2 Green links

Land bridges act as 'green bridges' to connect adjacent open space and vegetation visually and physically. They enhance and extend biodiversity and habitat links across the project.

3.3 Soil depth

Land bridges have sufficient depth of soil and a suitable soil profile to support healthy long-term growth of trees and shrubs.

3.4 Land bridge design

Land bridges are unique and visually appealing design elements for both the roadway and adjacent communities.

Land bridges extend surrounding public space and movement patterns and enhance the open space function. Design response should include innovative and integrated solutions.

Careful consideration is given to the driver experience including the use of lighting, quality surface materials that age gracefully, and the minimising of the need for structural elements (such as piers) that clutter views.

3.5 Visual considerations

Barriers on and adjoining land bridges are well integrated, provide good visual connectivity, maximise passive surveillance, and minimise visual obstructions to views and landmarks for the surrounding community.

Central piers and visual driver clutter is avoided for land bridges over cutting.

FIGURE 13 Demonstrates: extension and connection of open space via a landbridge. The Green Bridge, London.
Design: CZWG Architects LLP, Photography: © Philip Lane Photography

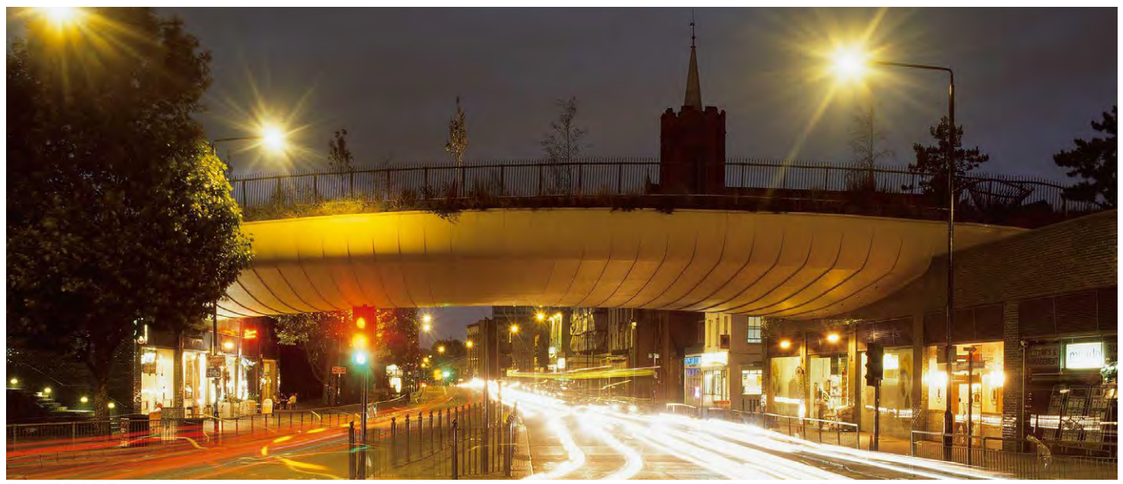


FIGURE 14 Demonstrates: design of bridge underside provides street level amenity. The Green Bridge, London.
Design: CZWG Architects LLP, Photography: © Barbara Piemonte

4. Open cuttings

FIGURE 15 Demonstrates: irrigated greenery that softens visual impact of the road. Domain tunnel entrance, Citylink, Melbourne.
Image: VicRoads

FIGURE 16 Demonstrates: use of existing natural stone in cutting as a design feature. EastLink Freeway, Melbourne.
Design: Wood Marsh and Tract Consultants, Image: EastLink

4.1 Connectivity

The design of open cuttings is part of a holistic urban design response to improve permeability, legibility and accessibility along and across the corridor, and severance impacts on communities are avoided.

The quality and number of path crossings over the project corridor are maintained to better connect communities, provide access to local facilities and link movement networks.

4.2 Cutting design

High quality finishes, materials and hard and soft landscapes are used in cuttings.

Cuttings are designed to mitigate adverse amenity impacts for adjacent residents and the local community, and to provide spaces that are considered and well resolved as part of the overall design solution.

4.3 Landscaping

Landscape design and plant species selection within open cut areas are appropriate to local conditions, micro-climate, urban design concepts and local character.

4.4 Visual considerations

Barriers on or adjacent to land bridges provide good visual connectivity, maximise passive surveillance, and minimise visual obstructions to views and landmarks for the surrounding community.

5. Ventilation structures, portals & tunnels

FIGURE 17 Demonstrates: curve-walled tunnel approach with dynamic visual experience. Vedeggio-Cassarate Tunnel Development, Switzerland. *Design: Cino Zucchi Architetti*

FIGURE 18 Demonstrates: well integrated tunnel approach which minimises impacts to surroundings. CityLink Western Tunnel portal, Melbourne. *Image: VicRoads*

FIGURE 19 Demonstrates: integration of structures and walls Melba Tunnel EastLink, Melbourne.
Design: Wood Marsh and Tract Consultants

5.1 Tunnel approach, dive structures and portal design

Tunnel approach, dive structures and portals make a positive contribution to the identity of the local area and user experience through high quality design.

The design is well coordinated, neat, attractive and inviting for motorists.

The portal design is context sensitive, avoids unnecessary clutter, minimises opportunities for vandalism and does not detract from the remaining tunnel system and components.

The portals transition smoothly to create a relaxed and safe feeling for motorists.

Signage is well integrated to ensure the tunnel approach and entrance is uncluttered.

The transition into the tunnel is welcoming, maximises road safety and provides a positive and memorable experience for the driver.

The tunnel entrance is of generous proportions to promote driver comfort.

5.2 Context sensitive

The tunnel and associated structures are well integrated into the local built context to minimise impacts on surrounding land uses, open spaces and connectivity.

The tunnel is integrated with the character of the local area, land form and landscape.

Opportunities to add value to the community are maximised such as green infrastructure, improved connectivity, interpretation of indigenous and historical cultural values etc.

FIGURE 20 Demonstrates: creative response and landmark feature that celebrates local context. Mullum Mullum Tunnel, EastLink, Melbourne. *Design: Wood Marsh and Tract Consultants, Image: VicRoads*

5.3 Landscape and visual considerations

The tunnel approach, dive structures, portals, ventilation structures and other associated buildings are designed to minimise negative landscape and visual impact on the surrounding community.

The surrounding landscape design responds to the structure's scale, and siting is sensitive to the surrounding environs with particular attention to bulk and scale. Associated elements such as flood walls are integrated into the structure (e.g. use of land form).

The position, form and overall appearance of the tunnel and associated structure are consistent with the characteristics and qualities of the local area.

5.4 Ventilation structure design

Large-scale elements such as ventilation structures and associated buildings are sensitively sited and designed, and well integrated to minimise negative impact on the surrounding area and adjacent communities.

Ventilation structures and buildings are to be high quality architectural and landscape design elements that are positive elements in the landscape when seen from outside the road corridor.

The architectural form, texture, colour and lighting of the ventilation structures and associated buildings are context sensitive and provide a positive contribution to the local environment.

Visual bulk and size is minimised through landform and vegetation and innovative design.

FIGURE 21 Demonstrates: integrated ventilation structure and tunnel approach. Waterview Tunnel, Auckland.
Design: Warren and Mahoney, Image: NZ Transport Agency

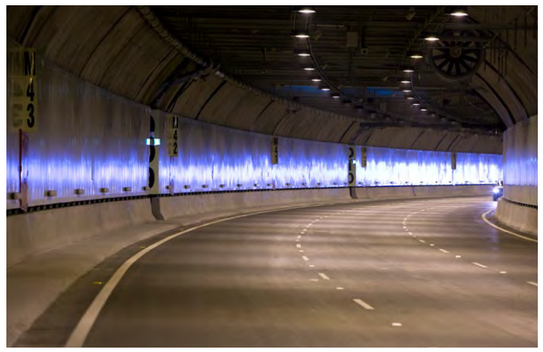


FIGURE 22 Demonstrates: Appropriate use of tunnel lining to improve user comfort, alter the tunnel profile and conceal mechanical services. EastLink, Melbourne.
Design: Wood Marsh, Image: EastLink

FIGURE 23 Demonstrates: Feature lighting used at strategic locations in tunnel to provide driver visual stimulation. EastLink, Melbourne. *Design: Wood Marsh, Image: EastLink*

5.5 Internal tunnel design

The internal design and profile of the tunnel provides a positive experience for the driver and appropriately addresses transitional and ambient lighting.

High quality and robust surface materials are used to enhance the driving experience, age gracefully, withstand harsh tunnel conditions and are easy to maintain.

Design features are provided in the tunnel to promote high quality driver experience that is appropriately designed for the speed at which they are viewed.

5.6 Safe and comfortable tunnel experience

The tunnel interior is designed to maximise driver safety and comfort, minimise feelings of claustrophobia and provide an appropriate level of visual stimulation at strategic points to influence driver alertness without being distracting.

5.7 Below ground orientation

The tunnel interior enhances cognitive mapping, minimises disorientation associated with long tunnels and winding ramps and enables awareness of location.

Opportunities are maximised to create landmarks or artistic elements within the tunnel that reflect the above-ground characteristics, assist with driver orientation and add interest to the journey.

The perceptual experience of the tunnel is shortened with points of visual interest along the journey.

6. Project buildings & ancillary structures

FIGURE 24 Demonstrates: green roof which integrates building with surrounding landscape. Victorian Desalination Plant, Victoria. *Design: ASPECT Studios, Photography: Peter Bennetts*

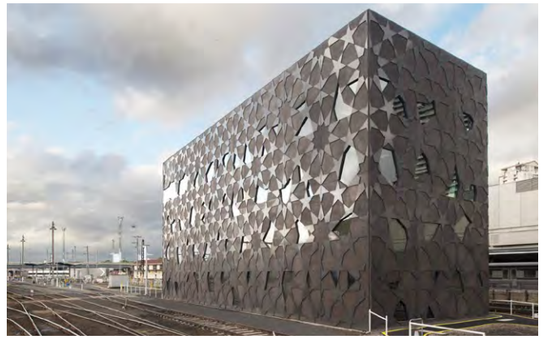


FIGURE 25 Demonstrates: well designed building facade that complements the rail yard environment. Yardmasters building at Southern Cross Station, Melbourne. *Design: McBride Charles Ryan Architects, Photography: John Gollings*

FIGURE 26 Demonstrates: design of operations building integrated with the design of freeway built elements. EastLink Operations Centre, Melbourne.
Design: Wood Marsh, Image: EastLink

6.1 Siting

New above-ground service and utility infrastructure are located to avoid or minimise impacts to existing to adjoining properties, and to reduce the need to remove vegetation.

The number and size of utility buildings and structures within public open space are minimised.

Above-ground utility buildings and structures are co-located with nearby existing structures and adjacent to vegetation to better integrate with the surrounding area.

They are located to maintain the amenity and function of the places they occupy, and minimise visual impacts on significant buildings, monuments, trees, open spaces and landscape vistas.

6.2 Integrated and coordinated

Project buildings, technical shelters, compounds and structures integrate sensitively with their surrounds, and complement and coordinate with existing nearby structures and fencing where appropriate.

The obtrusive appearance of utility buildings and structures from the public realm (public realm refers to all public open space along with other publicly-owned land between buildings including streets) is minimised through the use of appropriate landscaping screening (e.g. planting and land form), architectural façades, and/or security fencing that also function as a visual screen.

7. Public open space

FIGURE 27 Demonstrates: community recreation below structure. Citylink Burnley Bouldering Wall, Melbourne. *Image: VicRoads*

FIGURE 28 Demonstrates: integration of infrastructure with adjacent land uses. Caulfield to Dandenong Level Crossing Removal Project, Melbourne.
Design: ASPECT Studios, Photography: Peter Bennetts

FIGURE 29 Demonstrates: integration of public uses below structure. Caulfield to Dandenong Level Crossing Removal Project, Melbourne.
Design: ASPECT Studios, Photography: Peter Bennetts

7.1 Integration with surroundings

The design maximises continuity of public realm, extends surrounding public open space (land primarily used for recreation, nature conservation and passive outdoor enjoyment) and movement patterns, and mitigates any severing of communities and places.

Access to public open space within and at the interface of the project is enhanced. Opportunities to create additional functional and high quality open space within the project corridor are maximised.

The open space function of the open spaces within and along the project corridor is maintained.

Encroachment and impacts on adjacent open space by freeway infrastructure and roadside landscaping (planting within the road reserve) is minimised.

7.2 Open space infrastructure

Opportunities to upgrade the existing open spaces along the project corridor are maximised to create consistent, high quality, multifunctional and efficient spaces. This includes public open space infrastructure to enhance the function and enjoyment of the open space, such as seating, natural shade, drinking fountains, dog drinking bowls, emergency markers, bicycle leaning rails/ hoops and rest areas.

Public open spaces are consistent with local council or Parks Victoria furniture, material palettes and standards, and playground guidelines.

Park and recreation facilities are clustered within open spaces to encourage people to gather together and to have positive social interactions.

FIGURE 30 Demonstrates: well utilised public open space beneath pedestrian bridge at university campus. Burwood Link Bridge, Melbourne. *Design: Watson Architecture and GHD, Image: GHD*

FIGURE 31 Demonstrates: high quality public open space. with meeting places. San Donà di Piave, Italy.
Design: Cino Zucchi Architetti

7.3 Positive use of space

The design promotes and enables the positive use of public open space through design, with the resulting spaces being useful, attractive, activated, safe and sustainable. This includes incidental spaces such as those under ramps and viaducts, as well as pocket parks alongside the roadway.

Places are well designed to cater for a diversity of uses that promote opportunities for positive social interactions and incidental physical activity.

7.4 Pedestrian realm

Public open spaces are inclusive, pleasant and welcoming.

Seating, shade, shelter, ‘pause points’ and lighting are provided, as appropriate, and at regular intervals in open spaces at transport stops, on key pathways, and in community spaces associated with the project.

Natural daylight is maximised into public spaces below and adjacent structures.

7.5 Safety

New spaces created around the project feel safe, comfortable and welcoming to users during both day time and night time, maximising passive surveillance, clear sight lines and appropriate lighting.

8. Local streets, schools & neighbourhoods

FIGURE 32 Demonstrates: boulevard of trees contributing to streetscape amenity. Mature vegetation on local street, Watsonia.
Image: GHD

FIGURE 33 Demonstrates: tree planting in a road median to improve appearance and provide cooling. Mason Street, Altona.
Image: GHD

8.1 Pedestrian friendly local streets

Pedestrian-friendly areas and the '20 minute neighbourhood' concept is supported, with streetscapes that are comfortable, safe, inclusive, pleasant and welcoming to the local community.

8.2 Boulevards and streetscapes

Landscape design of local roads and streets as part of the project contributes positively to the function and character of the area. This includes the introduction of street tree planting, additional greening, pedestrian and cycling infrastructure.

The design of local streets is consistent with local authority requirements.

Boulevards of canopy trees are prioritised, especially adjacent to shared and pedestrian paths.

Seating, shade, shelter and lighting are provided, as appropriate, and at regular intervals, transport stops, on key pathways and in community places associated with the project.

8.3 Transition

Built elements and landscape are designed to sensitively transition from a highway environment to local streets and neighbourhoods.

8.4 School interfaces

Liaise with schools that interface the project to identify appropriate interface treatments. The design of road infrastructure around schools carefully considers local identity, sense of arrival, legibility of access points and operational requirements.

The landscape design response filters and screens any views of road infrastructure from school grounds where appropriate.

9. Walls, fencing, barriers & screens

FIGURE 34 Demonstrates: buffer planting used to mitigate views and enhance appearance of walls. Eastern Freeway, Melbourne. *Design: Wood Marsh, Image: NELP*

FIGURE 35 Demonstrates: high quality road interface scaled for pedestrians. Todd Road, Melbourne.
Design: Tract Consultants, Image: VicRoads

FIGURE 36 Demonstrates: noise mitigation responds to the local context. *Goulburn Valley Highway, Victoria.*
Design: VicRoads

9.1 Noise and visual mitigation

Noise attenuation elements are high quality and context sensitive.

Innovative methods of noise mitigation are maximised to reflect/refract and/or absorb noise.

Landscaping and landscaped embankments enhance and soften the appearance of walls and barriers, reduce height and bulk, and better integrate the structures into the surrounding area.

9.2 Integrated and coordinated

Noise walls, flood walls, fences, screens and traffic barriers are coordinated and integrated to minimise visual and physical clutter. These elements integrate with existing or proposed elements to reduce the need for additional structures and transition seamlessly into the existing elements.

Opportunities to incorporate new built form as noise mitigation are maximised to replace the need for noise walls.

Transitions in wall and fencing heights are well considered and seamless.

Materials and colour palettes are coordinated, and finishes are high quality.

9.3 Local context and scale

Walls, fencing and screens are designed in response to the surrounding areas, with careful consideration to form, texture and colour on both sides of the walls.

Use of colour is appropriate to location, and minimises the impact on residential and sensitive uses, including negative impacts from coloured light from transparent materials.

Both faces are designed to the same standard of quality, with a front and a front, rather than a front and a back.

Walls are appropriately designed to address the speed at which they are viewed. Design on public and residential interfaces reflects a pedestrian scale, whereas the roadside interface reflects the scale of a high-speed vehicle environment.

Walls and other structures are sensitively sited and proportionate to the surrounding structures, landscape and urban elements.

FIGURE 37 Demonstrates: semi-enclosed transparent noise wall to reduce visual bulk and allow light into the adjacent creek. Eastern Freeway, Melbourne. *Design: Wood Marsh*

FIGURE 38 Demonstrates: transition of noise wall types (on and off structure noise walls with continuous protection barrier). Deer Park Bypass, Melbourne. *Design: Peter Elliott, Image: VicRoads, Photography: John Gollings*

FIGURE 39 Demonstrates: dynamic and sculptural screening near tunnel entrance. Vedeggio-Cassarate Tunnel Development, Switzerland. *Design: Cino Zucchi Architetti*

9.4 Interfaces

The creation of unsafe narrow areas between noise walls and residential properties are avoided and minimised. Innovative solutions are included to ensure any narrow spaces are pleasant and safe.

Walls respond to the adjacent land uses and boundaries and maximise opportunities for dual use.

9.5 Transitions

Transitions in types and materials of walls, barriers and fencing appropriately address adjacent sensitive land use, property boundaries and vegetation.

Changes in wall heights and materials types in walls, barriers and fencing are well considered.

9.6 Visual connectivity and solar access

Transparent barriers are used to take advantage of scenic and adjacent views of surrounding landscape, and reduce the bulky appearance of structures.

Walls and barriers are designed (for example sited or angled) to avoid or minimise overshadowing of properties, waterways and open space. Transparent barriers are used to optimise solar access, and to maximise visual connectivity across corridor to connect communities.

Walls and barriers are responsive to the local environment and allow sunlight to waterways and ecological areas.

9.7 Anti-throw screens, public safety barriers (PSB) and privacy screens

Anti-throw screens, public safety barriers and privacy screens are well integrated with bridge and road structures and utilise high quality architectural materials while maintaining a high quality aesthetic form. The scale and visual bulk of throw screens are minimised.

Screens are designed to avoid the perception of entrapment that may become a barrier to

FIGURE 40 Demonstrates: privacy screens on bridge used to minimise overlooking to residential areas. Hawkstowe Station, Melbourne. *Design: Grimshaw, Image: GHD*

FIGURE 41 Demonstrates: Visually permeable safety barriers comprised of high quality architectural materials. Westgate Bridge, Melbourne. *Design: Peter Elliott*

FIGURE 42 Demonstrates: architecturally designed, tasteful noise walls which enrich the journey with an experiential quality. Eastern Freeway, Melbourne. *Design: Wood Marsh*

use. Anti-throw screens have good visual permeability when viewed from adjacent areas, to maximise passive surveillance.

9.8 Flood walls and retaining walls

Walls are carefully integrated with the landform. Opportunities to use earth embankments and screen planting to mitigate the visual height and bulk of walls are maximised.

Walls are integrated with traffic barriers, fencing, throw screens and other structures to reduce visual clutter.

Walls have a consistent form, design and material palette.

Wall design appropriately reflects the surrounding landscape, urban form and the local context.

Walls at the entrance to tunnels and along the road corridor use a consistent design and materials, are integrated with the landscape and have appropriate maintenance access.

9.9 Deterring graffiti

High quality materials and textured surfaces are used on walls, fencing and screening to deter graffiti, particularly at lower levels of the noise wall.

Other opportunities for innovative solutions to deter graffiti are maximised.

9.10 Maintenance

Walls are designed to minimise maintenance burden through the selection of high quality materials that are durable, not subject to environmental damage and can be accessed to maintain their high quality.

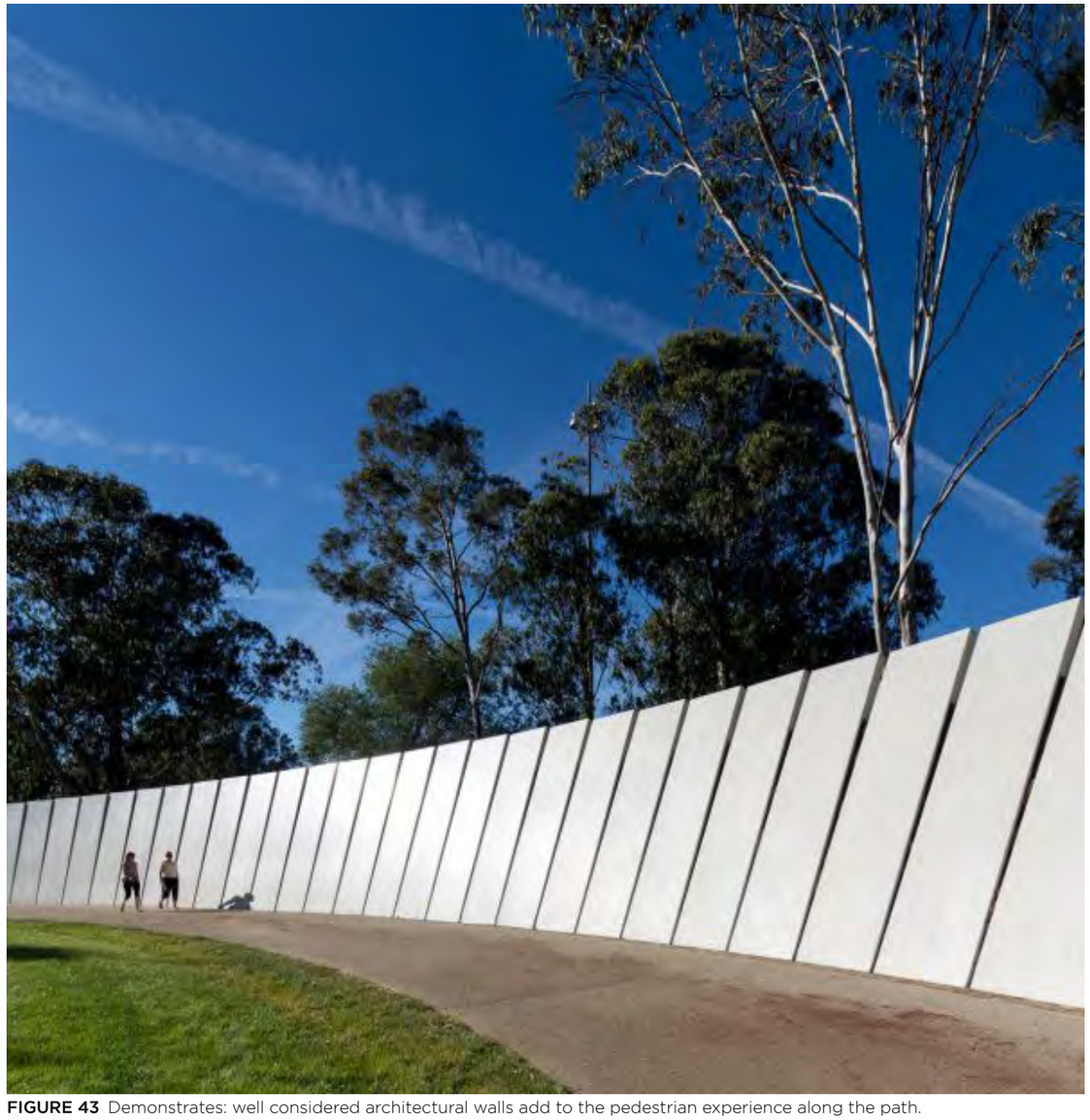


FIGURE 43 Demonstrates: well considered architectural walls add to the pedestrian experience along the path.
Design: Lahz Nimmo Pty Ltd and Spackman Mossop Michaels, Photography: Brett Boardman

10. Bus park & ride, & bus lanes

FIGURE 44 Demonstrates: a station designed for passenger comfort. Perth Busport. *Design: GHD Woodhead, Photography: Douglas Black Photography*

FIGURE 45 Demonstrates: High quality weather protection design. The Pforzheim Central Bus Station, Pforzheim, Germany. *Design: Metaraum Architects, Photography: Zooey Braun*

FIGURE 46 Demonstrates: simple, context sensitive bus station design. Blackburn Station bus bays, Melbourne. *Design: Hassell, Image: GHD*

10.1 Bus interchanges

Bus interchanges provide a high quality experience for commuters that enhances their journey, provides intermodal connections and increases neighbourhood connectivity.

Interchanges have demonstrated capacity to support or facilitate future service changes.

10.2 Bus station design

The design of the interchange optimises their dual role as service points for public transport infrastructure and as public landmarks. Architecture of the bus interchange is high quality and provides a positive built-form contribution to the local area. The public realm promotes pedestrian activity, creates vibrant spaces, uplifts connectivity, and integrates the interchange precinct into the surrounding area.

Complementary land use and activation opportunities such as commercial, retail and public facilities are maximised. Car parking areas are safe and positive places.

Weather protection must be provided such as shelters and passenger lounges. Break rooms and toilets for drivers are conveniently located to minimise disruption to services.

10.3 Innovation

Innovative design solutions that add value to project should be incorporated into the design. These are solutions that are not commonly used in the Victoria and are beyond business-as-usual approaches. These solutions include locating of ticketing devices on platforms, creating more attractive 'airport' style waiting spaces, integrating retail and public amenities into station building, initiatives that support intermodal interchange such as shower and change room facilities, integrating future-thinking technologies, and built form sustainability initiatives that contribute to beyond business-as-usual sustainability outcomes.

FIGURE 47 Demonstrates: Inner Northern Busway, Brisbane. *Photography: Christopher Frederick Jones*

FIGURE 48 Demonstrates: weather protected waiting areas with clear sightlines. Eastern Busway, Brisbane. *Design: Cottee Parker, Photography: Christopher Frederick Jones*

FIGURE 49 Demonstrates: weather protected bus terminal for passenger comfort. Eastern Busway, Brisbane. *Photography: Christopher Frederick Jones*

10.4 Transport and active travel connections

Interchanges provide the ability for commuters to undertake effective, safe and comfortable inter-modal connections to public transport, vehicles and active transport.

Customers are provided with clear and open movement within the bus precinct/station. Walking and cycling along priority routes into the precinct, along desire lines and at entry points (both existing and future) within the precinct is improved. Walking and cycling connections link into the surrounding network, and are convenient, direct and attractive to use.

End of trip and bicycle amenities including bicycle parking are provided.

Clear sight lines and well integrated connections are provided to feeder bus services and other modes of transport. The entry and exit to facilities and stops are identifiable and easy to access.

10.5 Bus lanes and busway

The design creates a clear corridor that supports the efficient, safe and high speed movement of buses.

The corridor infrastructure has a strong visual identity, works to break-up the perceived expanse of freeway, is responsive to the adjacent landscape and urban form, and creates a memorable public transport experience. The busway design is sympathetic to the design of the Eastern Freeway.

Busway is designed to achieve high quality urban design and landscape outcomes.

11. Car parking

11.1 Car park design

Car parks will maximise opportunities for vehicle efficiencies such as via other off-peak uses of car park area, and the integration of commuter car parking into any site development.

Landscaping is used in car parks to mitigate the visual impact of large expanses of pavement and to create attractive buffers to residential interfaces. Canopy tree planting is used in car parks to enhance amenity and to provide shade.

Opportunities to incorporate Water Sensitive Urban Design infrastructure into the car park precinct is maximised to reduce surface water flow impacts and to provide passive irrigation to planted areas.

11.2 Connectivity and safety

Car parking areas feel safe during the day and night time, passive surveillance is maximised with clear sight lines for pedestrians and cyclists.

Car parking areas support the ease of movement for pedestrians and cyclists and avoid or minimise the potential for conflict with vehicles. Access points to walking and cycling paths are clearly defined and are separate from vehicle movements.

11.3 Signage and entries

Entries to car parks are legible and clear for all modes of transport. Entry points and signage are of high quality design.

FIGURE 50 Demonstrates: Water Sensitive Urban Design infrastructure and tree planting incorporated into the car park. Henry Turner Oval car park, Melbourne. *Design: GHD*

12. Lighting

12.1 General lighting

Functional lighting design and light elements for roads and paths integrate with infrastructure and surrounding areas, and are appropriate to surrounding land uses and enhance personal safety.

Lighting creates a cohesive identity for the project and is integrated with built elements and the general lighting approach.

12.2 Feature lighting

Feature lighting is integrated with road lighting to enhance navigation and user experience. All lighting appropriately addresses impacts to sensitive adjacent land uses.

12.3 Light pollution

Lighting employed in the project is designed sensitively for the surrounding environment and to avoid or minimise light pollution.

12.4 Maintenance

General and feature lighting include designs and elements that maximise road safety, are environmentally friendly and can be safely maintained.

12.5 Energy efficiency

Energy efficient lighting is used to reduce ongoing energy consumption.

FIGURE 51 Demonstrates: mast road lighting creating a navigational landmark. Eastern Freeway, Melbourne. *Image: NELP*

FIGURE 52 Demonstrates: lighting used at select locations along the freeway. M80, Melbourne.
Design: Peter Elliott, Photography: VicRoads

13. Walking & cycling infrastructure

FIGURE 53 Demonstrates: use of transparent material to provide visual permeability to the road for improved perceived cyclist safety. M80, Melbourne. *Design: Peter Elliott, Image: VicRoads*

FIGURE 54 Demonstrates: shade trees and community infrastructure located along path. Koonung Creek Trail, Melbourne. *Image: NELP*

FIGURE 55 Demonstrates: high quality cycling and walking infrastructure. Darebin Yarra Trail, Melbourne. *Design: VicRoads, Photography: Emma Cross*

13.1 Pedestrian and cycling network

The project maintains or enhances the existing pedestrian and cycling network.

Walking and cycling connectivity through local neighbourhoods is improved with integrated links and connections across the project.

Clear visual and movement linkages between streets, footpaths, bicycle paths, and public open spaces connect public transport, neighbourhood activity centres, schools and other key community facilities and services.

13.2 Encourage cross-community connectivity

Opportunities to remove barriers that discourage walking and cycling, cross-project corridor connectivity, and the community's ability to reach everyday services and facilities within a 20 minute walk are maximised. These barriers include physical obstructions, and a lack of shade and rest stops.

Pedestrian and cycle crossings of the project corridor are celebrated and emphasised to encourage greater sense of connectivity

13.3 Pathways and connections

Connectivity and continuity of on-road and off-road walking and cycling routes along and around the corridor are maintained and enhanced.

Any existing trails impacted by works are realigned to retain connectivity.

Pathways are direct and convenient. Access is maintained or improved with direct, pleasant and safe pedestrian and cycling links.

Opportunities for grade separation of walking and cycling paths from roads are maximised.

Off-road walking and cycling paths are high quality, suitably wide, functional and aligned appropriately.

The transition between cycling paths is continuous and seamless with direct routes and consistent design elements. The riding environment is safe and appealing. Extent of local and strategic cycling corridors is maximised.

13.4 Path separation

Separated walking and cycling paths are used in high-use areas where appropriate, and avoid and minimise the potential for conflict between intersecting travel paths.

13.5 Pedestrian crossings

Pedestrian crossings are provided at strategic points to encourage safe travel behaviour and enhanced connectivity. They are regularly spaced. The distances between them minimised.

13.6 Perceived safety

Perceptions of safety along walking and cycling paths are improved for pedestrians and cyclists, through good design, to remove barriers to participation.

13.7 Shade

Canopy trees are maximised along pedestrian and cycle routes, to provide amenity and shade.

13.8 Prioritise pedestrians

Pedestrian priority is maximised on key walking routes into and around key community facilities and destinations (including activity centres, Park and Rides and nearby schools and aged care facilities) by providing a high quality walking environment. This includes shade, drinking fountains at appropriate intervals and rest stops with seating.

Pedestrian-friendly walkways are free from obstructions and have a smooth surface.

Outdoor furniture and fixtures such as bins, bicycle parking and drinking fountains are offset from pedestrian pathways.

13.9 Wayfinding

Wayfinding and signage is used to improve the ability for people to find their way to key destinations.

13.10 Wayfinding signage design

Wayfinding signage provides clear and reliable information, as well as being appropriate and sensitive to the environment and users of varying abilities. A balance is struck between sufficient signage and visual clutter. Obstructions to key sightlines are avoided or minimised.

Signage is consistent and well integrated with any existing local signage systems. Route hierarchy is coherent.

Standard route naming is adopted along entire routes, negotiated with the relevant authority. Individual branding incorporating graphic devices is employed, such as the Koonung Creek Trail branding.

A list of 'standard' destinations is developed for each route in consultation with the relevant authority. Names and notation are consistent with those used on other wayfinding signs and maps.

Signage is provided where users join the route, at the ends of the route and at any significant intersection with another, route, trail, path or road.

Alternative routes are signed where appropriate, such as where the main route may flood.

Signage is provided at any point where route continuity is unclear.

Signage is high quality, graffiti proof, weatherproof and low maintenance.

FIGURE 56 Demonstrates: wide recreational trail with clear sightlines and integrated seating spots. Bowen Place Crossing, Canberra. *Design: Lahz Nimmo Pty Ltd and Spackman Mossop Michaels, Photography: Brett Boardman*

14. Walking & cycling bridges

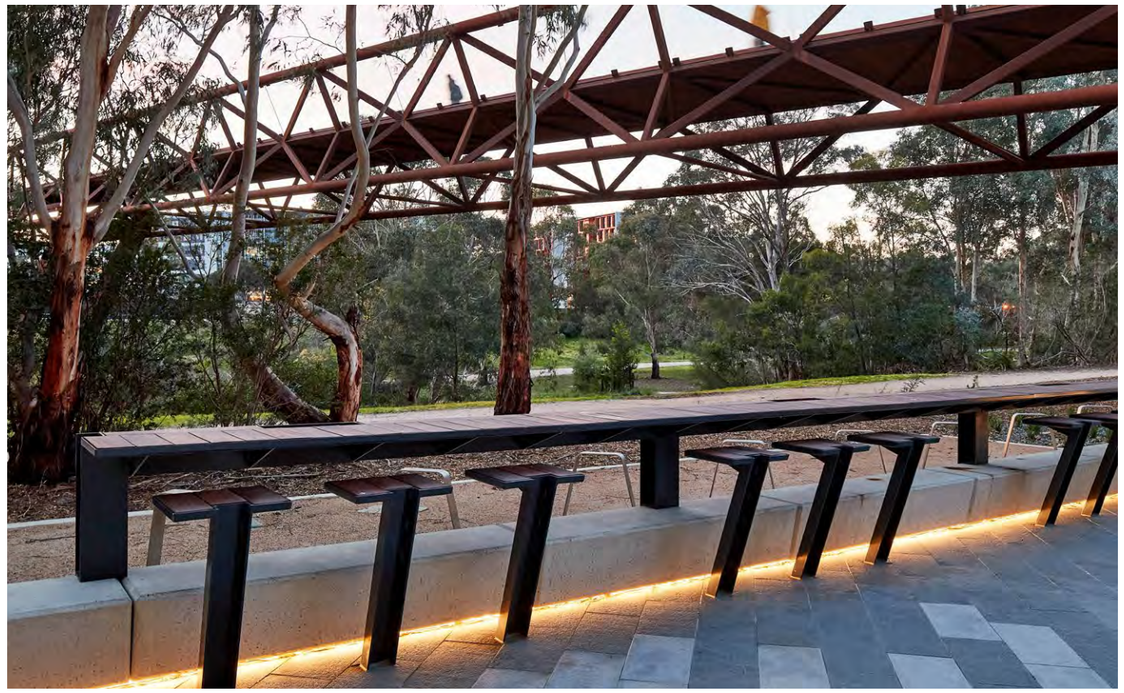


FIGURE 57 Demonstrates: unique architectural bridge sits sensitively to the natural context. Deakin University Pedestrian Bridge, Melbourne. *Design: Watson Architecture and GHD, Image: GHD*

14.1 Walking and cycling bridge design

Walking and cycling bridges are high quality and suitably wide to allow for passive surveillance and maintenance vehicles.

Walking and cycling bridges are well designed and proportioned, and are visually appealing design elements for the roadway and adjacent communities.

Bridges are structurally expressive and durable and the need to enhance the appearance of the bridge by use of cladding is avoided.

Walking and cycling bridges use structural form, materials, texture and colour to create an identity for the project.

Bridges respond to the surrounding context and are sensitive to the local character of the area.

14.2 Entries

Bridges have a sense of openness at the approach, with a clearly identifiable entry and effective wayfinding.

14.3 Safety

Bridges provide a high level of passive surveillance and perception of safety.

14.4 Minimising impacts

Elevated structures are designed to minimise landscape and visual impacts, overlooking and overshadowing of residential and other sensitive areas.

The visual impact of the bridge structure on road users is minimised.

Planting is used to integrate ramps with their surroundings and reduce their visual impacts.

14.5 Access

Walking and cycling bridges meet universal access requirements with ramps and stairs for direct access.

FIGURE 58 Demonstrates: a high quality user experience which takes advantage of its setting. Darebin Yarra Trail, Melbourne. *Design: VicRoads, Photography: Emma Cross*

FIGURE 59 Demonstrates: integration of screens into the form of the pedestrian bridge. Williams Landing Train Station, Melbourne. *Design: Arup and Cox, Image: VicRoads*

FIGURE 60 Demonstrates: a cable stay pedestrian bridge that is responsive to the surrounding context. Thompson River, Sale. *Design: VicRoads, Image: GHD*

FIGURE 61 Demonstrates: well integrated interface between pedestrian bridge and adjoining path. Darebin Yarra Trail, Melbourne. *Design: VicRoads, Photography: Emma Cross*

FIGURE 62 Demonstrates: an Indigenous inspired lattice bridge that is visually appealing. Webb Bridge, Melbourne. *Design: Denton Corker Marshall and Robert Owen, Image: GHD*

14.6 Views

The design takes advantage of scenic views and vistas, and space for stopping and viewing does not significantly interrupt pedestrian and cycle movement.

14.7 Lighting

Lighting is integrated into the design to make the crossing attractive and appropriate for night time use.

FIGURE 63 Demonstrates: a footbridge with sculptural qualities that enriches the user experience. Arguanzuela Footbridge, Madrid. *Design: Dominique Perrault Architecture, Image: GHD*

FIGURE 64 Demonstrates: contextually responsive design to the differing viewing conditions on either side of the bridge. Caxton Roma Pedestrian Link, Brisbane. *Design: EDAW, Photography: Christopher Frederick Jones*

FIGURE 65 Demonstrates: cable stay pedestrian bridge that creates a landmark for travellers and eliminates the requirement for roadside barriers. EastLink, Melbourne. *Design: Wood Marsh, Image: GHD*

15. Walking & cycling underpasses

15.1 Entries

Underpasses have a sense of openness at the approach, with a clearly identifiable entry and effective wayfinding.

15.2 Connections

Underpasses are strategically located to improve any gaps in the existing path network. Topography and entry points are integrated with the existing path network to provide a seamless and safe journey with clear sight lines.

Paths are generously proportioned with room for pedestrians and cyclists traveling in both directions.

15.3 Safety

Underpasses have clear visual connections through to the streetscape and public spaces on either side. Underpasses are wide enough to provide a high level of passive surveillance and perception of safety. The length of underpasses is minimised.

15.4 Deterring graffiti

Internal and external walls use high quality materials with graffiti-resistant surfaces.

15.5 Natural lighting

Opportunities to incorporate openings for natural daylight are maximised to improve lighting and reduce operating costs.

15.6 Artificial lighting

High quality artificial lighting is used to enhance safety for pedestrians and cyclists. Lighting elements are included as design features integrated into the structure.

FIGURE 67 Demonstrates: well integrated retaining walls extended to address safety as part of the design. *Design: Lahz Nimmo Pty Ltd and Spackman Mossop Michaels, Photography: Brett Boardman*

FIGURE 66 Demonstrates: use of natural light and a generous proportioned underpass. Bowen Place Crossing, Canberra
Design: Lahz Nimmo Pty Ltd and Spackman Mossop Michaels, Photography: Brett Boardman

FIGURE 68 Demonstrates: clear visual connections through underpass with highly textured vibrant walls.
Design: Jasmax, Photography: Meg Back

16. Navigational nodes & thresholds

FIGURE 69 Demonstrates: integrated pedestrian bridge with noise walls to create a gateway that frames Melbourne's skyline. Craigieburn Bypass, Melbourne. *Design: Taylor Cullity Lethlean, Tonkin Zulaikha Greer Architects and Robert Owen, Image: VicRoads*

FIGURE 70 Demonstrates: an interchange celebrated as a gateway which assists with navigation in a complex interchange. M80, Melbourne. *Design: Peter Elliott and VicRoads, Photography: John Gollings*

16.1 Hierarchy

A hierarchy of identifiable elements are located along the corridor, in accordance with the key design directions set out in this document, to help the community to navigate and identify their location. These elements should incorporate scenic views to the city, mountains, ridgelines and existing natural or built features; or through the design of elements that respond to cultural and historic values, geology, topography, water course, vegetation, above-ground characteristics and places above tunnels, and/or the urban setting.

16.2 Structures as features

Opportunities are maximised for attractive, identifiable and well-designed structures (interchanges, ramps, bridges etc.) that also act as navigational nodes and threshold treatments.

Built features and elements are meaningful and are not superfluous visual elements.

16.3 Visual clutter

Visual clutter is to be minimised including from road lighting.

17. Landscape

FIGURE 71 Demonstrates: robust and sustainable roadside planting. Eastern Freeway, Melbourne. *Design: VicRoads, Wood Marsh and Tract Consultants, Image: NELP*

FIGURE 72 Demonstrates: buffer planting and mounds filter views from residential areas. Koonung Creek Reserve, Melbourne. *Image: NELP*

FIGURE 73 Demonstrates: use of vegetation to soften tunnel entry. M80 Jacana Tunnel entry in Pascoe Vale, Melbourne. *Image: VicRoads*

17.1 Green corridors

The project enhances the quality of the surrounding landscape and strengthens existing green corridors. New landscape work complements the existing soft landscaping and is distributed evenly throughout the project. Landscaping is undertaken early in the construction process where practicable, prioritising areas that will not be impacted by future construction, in order to maintain the green character of the area.

17.2 Roadway identity

Landscaping unifies the road corridor, contributes to the identity of the roadway and enhances the experience when driving through the area.

17.3 Integration

The landscape design integrates the road environment into the existing landscape character and urban fabric.

Landscape areas are clearly defined and are not left-over and undesirable spaces.

17.4 Minimising loss

The removal of mature trees, planted and remnant native trees and remnant vegetation, (particularly large amenity trees, heritage vegetation and vegetation within or connected to open space) is minimised.

Opportunities to retain all valuable habitat linkages or corridors are maximised.

An approach for the reuse of existing vegetation to be removed is developed.

17.5 Enhance habitat and biodiversity

New landscapes corridors are developed to enhance biodiversity and habitat links (both new and existing). Indigenous vegetation is planted in existing habitat linkages and corridors to strengthen biodiversity and provide habitat links for native fauna to move more easily through the urban landscape.

Opportunities to create fauna habitat and links are maximised, including the use of hollow logs, nesting boxes and rope ladders as part of any landscape works undertaken within biodiversity zones and natural open spaces.

FIGURE 74 Demonstrates: a sensitively placed land bridge Leura land bridge over Great Western Highway. *Design: Spackman Mossop Michaels*

FIGURE 75 Demonstrates: arterial median or roadside planting where trees and groundcovers used to soften hard paving and/or to provide shade. Great Western Highway between Leura and Katoomba. *Design: Spackman Mossop Michaels*

17.6 Visual mitigation

Landscaping is used to filter or screen views of road infrastructure and head light glare.

The punctuation of built form and structures above treed ridgelines is minimised. Support a canopy of mature trees as the dominant visual element throughout the project corridor.

Roadside landscape is used to mitigate the visual impact of large expanses of asphalt and to enhance the driver experience.

17.7 Be inspired by local assets

The landscape design takes cues and is inspired by nearby local environmental assets including the Yarra Valley Parklands, Koonung Creek, Plenty River Gorge, Gresswell Nature Forest, Banyule Creek and Simpson Barracks.

Landscapes along river and creek corridors that are impacted by the project are rehabilitated and naturalised for ecological and experiential benefits.

17.8 Urban forest

New tree planting and vegetation is prioritised within the project corridor, including adjoining streets, medians, buffers and in carparks, to support the urban forest.

Opportunities for tree planting within the roadway landscape, local streetscapes, in buffer planting, and on highpoints and ridgelines is maximised.

Innovative engineering solutions are used to maximise tree planting.

Where there is a conflict between planting canopy trees and maintaining views, canopy tree and buffer planting may take precedence.

Services are located to optimise tree planting.

17.9 Plant health

The design provides sufficient set-backs, soil, and conditions for new and existing trees and vegetation to maintain and support plant health and growth.

17.10 Plant selection

Planting throughout the project is self-reliant, sustainable and requires minimal maintenance. Native species of local provenance are used in environmentally sensitive areas and/or identified biodiversity sites and corridors.

The potential for impacts on identified biodiversity and habitat corridors and sites, and the Yarra River corridor by introduced species, is minimised.

Trees and other vegetation are selected, to take into account predicted future changes in climate.

Plant species selection is consistent with State and local government guidance.

New tree planting, within or adjacent to the road reserve, is appropriate to the scale for the road environment and considers maintenance access.

17.11 Buffer planting and land form

Landscape design elements including buffer planting (planted vegetation situated outside the road reserve) and land form are used to create a visual buffer between the roadway and surrounding areas. Existing buffer planting is retained at the edges of any widened road corridors.

Land form is used to reduce the apparent height of walls, barriers and road infrastructure.

A suitable width of low planting is used to separate pedestrian and roadside traffic.

FIGURE 76 Demonstrates: a landscape design that responds to the high speed viewing environment through the use of terraced planting. CityLink, Melbourne. *Design: EDAW, Image: GHD*

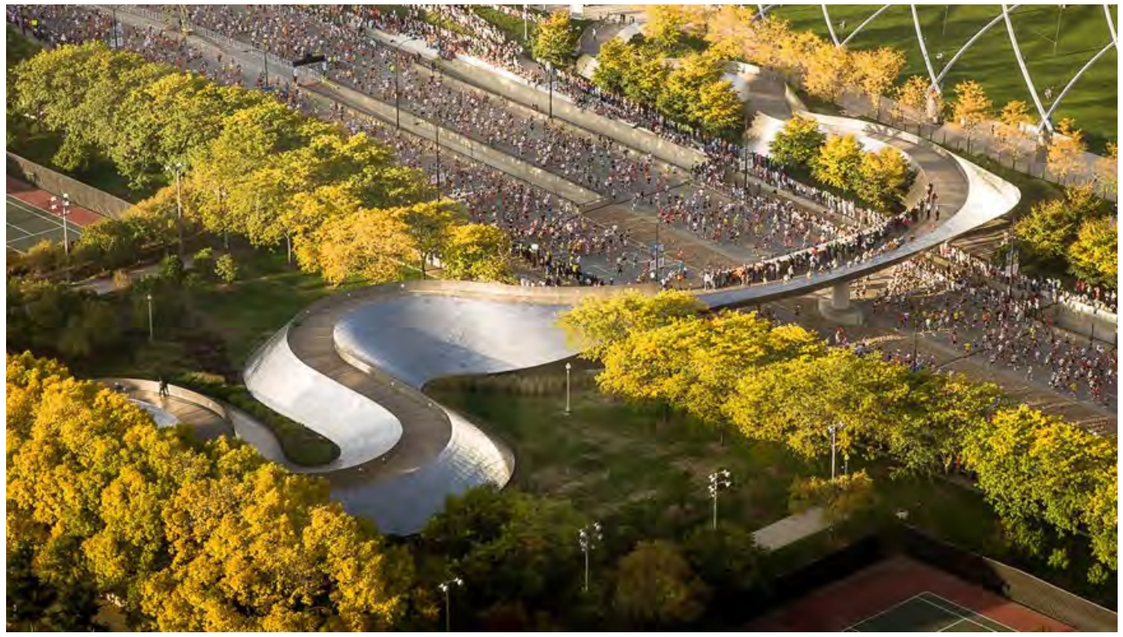


FIGURE 77 Demonstrates: well considered tree boulevards with innovative infrastructure. BP Pedestrian Bridge, Chicago. *Design: Frank Gehry, Image: Millennium Park Foundation*

18. Water

FIGURE 78 Demonstrates: context sensitive Water Sensitive Urban Design. Leopold, Melbourne. *Design: GHD*

FIGURE 79 Demonstrates: wetlands serve environmental and social functions. Adelaide Botanic Gardens Wetland, Adelaide. *Design: Taylor Cullity Lethlea*n, *Image: GHD*

18.1 Water sensitive design

A 'water-sensitive design' approach is used to integrate water management objectives into the project's urban design and achieve a broad range of community and environmental benefits. This includes the use of passive irrigation techniques, and the incorporation of Water Sensitive Urban Design infrastructure such as swales, bio-filtration systems (rain gardens) and wetlands.

A holistic approach to integrated water management across the entire project should be adopted.

18.2 Healthy waterways

The project maintains or improves the river health of the waterways that it crosses. Drainage infrastructure maximises opportunities to replicate natural processes in the treatment of water, and enhances stormwater management outcomes, as well as broader urban design and ecological values.

18.3 Daylighting waterways

Opportunities are maximised to preserve and restore natural and open waterways, and to 'daylight' (restore to a more natural state above ground) sections of creeks and streams that have previously been diverted into a culvert, pipe or drainage system to improve aesthetics, amenity and ecological values.

Roadway crossings of waterways and wetland are minimised.

18.4 Minimise habitat impacts

Road infrastructure is designed, located and constructed to minimise short and long-term impacts on riparian, riverbed and aquatic habitat.

FIGURE 80 Demonstrates: architectural design aspects within Water Sensitive Urban Design infrastructure. Edinburgh Gardens Raingarden, Melbourne. *Design: GHD*

18.5 Drainage infrastructure and retarding basin design

Drainage infrastructure and retarding basins are located and designed to not adversely impact on the function of public open space. Drainage infrastructure within public open space does not inhibit the ability of local residents to have access to open space near where they live. New infrastructure enhances recreational values, and contributes positively to the quality and function of the open space.

Low points in basins are strategically located to maximise useable open space, and to minimise disruption to the community's enjoyment of open space, particularly following wet periods.

Drainage infrastructure is designed to visually blend into the surrounding landscape.

18.6 Maximise community and environmental benefits

Opportunities for community education and to integrate community recreational infrastructure (e.g. seating, paths, boardwalks) are maximised.

Water Sensitive Urban Design infrastructure is prioritised at locations where there are opportunities for water harvesting, treatment and reuse that support community facilities (such as providing a source of treated water for the irrigation of sporting fields).

Water Sensitive Urban Design infrastructure does not limit opportunities to use landscape to mitigate visual impacts of the project (that is, by reducing available space for planting of trees and vegetation to filter views towards infrastructure).

Water Sensitive Urban Design infrastructure is located and designed to support the proposed hierarchy of navigational nodes.

18.7 Raingarden and wetland design

Water Sensitive Urban Design infrastructure is integrated with the surrounding context and is designed to enhance the aesthetic appeal and ecological values of the area. Water Sensitive Urban Design maintains existing and planned key walking and cycling movement connections.

Wetlands and raingardens located within or near the Yarra River floodplain or along creek and waterway corridors are naturalistic in form and aesthetics. The location of these elements avoids or minimises impact on existing recreational values.

New wetland shapes respond to the contours of the land. The design provides a balance between natural areas for animal and bird life, and areas for public amenity, including places for respite, recreation and seclusion.

FIGURE 81 Demonstrates: Water Sensitive Urban Design adjacent road infrastructure assists integration as a well resolved constructed ecology. Eastern Freeway, Melbourne. *Design: VicRoads, Wood Marsh and Tract Consultants, Image: NELP*

FIGURE 82 Demonstrates: constructed wetland and vegetated embankment. EastLink, Melbourne.
Design: Wood Marsh and Tract Consultants, Image: EastLink

19. Road signage

19.1 Strategic approach

A consistent, coordinated, whole-of-corridor signage and wayfinding approach is developed to enhance driver legibility and safety, and to improve the overall experience.

19.2 General signage

Signage, toll points, gantries, and associated infrastructure are sited and designed to be well integrated along the corridor. The scale and character of the area is not undermined with a dominating skyline, or with significant views blocked by signage infrastructure.

Minimise visual impacts from signage and toll points on local communities and on the quality of the adjoining public realm.

Signage infrastructure is located sensitively, relative to topography, access, safety, security, visual impact, landform and vegetation.

19.3 Design

Signage and gantries are consistent, with a simple structure and with consideration to form, shape and colour.

Unauthorised access and vandalism is prevented.

19.4 Siting to reduce visual clutter

Signage and gantries are consolidated and rationalised where appropriate to minimise the number of overhead elements.

The locating of signage on bridges and structures is minimised. Signage at tunnel entries is avoided. Signage is well integrated with the design of project elements.

The locating of gantries on ramps and elevated structures, or within close proximity to bridges is minimised.

Gantries are integrated inside tunnel ceilings to avoid visual clutter at portals.

Opportunities are maximised to co-locate features such as signage, toll points, Lane Use Management Signs (LUMS), Closed Circuit Television (CCTV), Variable Speed Limit (VSL) signs and Variable Message Signs (VMS) on shared gantries, light poles and other shared assets. Alternative tolling solutions and the 'designing out' of radio frequency (RF) barriers are considered, to avoid or minimise visual impacts.

FIGURE 83 Demonstrates: good integration of road barriers, landscaping, noise walls, wayfinding markers and signage gantries. Craigieburn Bypass, Melbourne. *Design: Taylor Cullity Lethlean, Tonkin Zulaikha Greer Architects and Robert Owen, Image: VicRoads*

FIGURE 84 Demonstrates: LUMS (land use management) integrated with pedestrian bridge. M1 York Street pedestrian bridge, Melbourne. *Design: Denton Corker Marshall, Image: VicRoads*

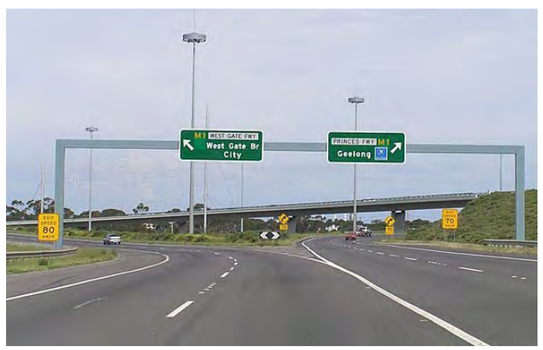


FIGURE 85 Demonstrates: a simple and uncluttered gantry design which does not detract from surrounding built form elements. M1 gantry, Melbourne. *Image: VicRoads*

20.Materials & finishes

FIGURE 86 Demonstrates: transparent and clear noise walls minimise overshadowing and provide views to landscape outside the freeway reserve. M1 Monash York St Pedestrian bridge, Melbourne. *Image: VicRoads*

FIGURE 87 Demonstrates: high quality and durable noise walls. EastLink, Melbourne. *Design: Wood Marsh, Image: GHD*

FIGURE 88 Demonstrates: reuse of reclaimed site materials in project design. Middle Gorge Station as part of the South Morang line to Mernda extension.
Design: Grimshaw, Image: NELP

20.1 High quality

Materials and finishes used in the project are high quality, durable, robust, easy to maintain, and will weather and age well over time.

20.2 Colour palette

The colour palette for the materials and finishes is consistent along the project's design character areas, sensitive to the local environment and reinforces the broader wayfinding approach for the corridor.

20.3 Reflectivity

New materials and finishes minimise light pollution in the surrounding areas from reflectivity.

20.4 Vandalism

Selection and application of materials and finishes discourages and minimises the potential for vandalism including graffiti.

20.5 Identity through design

The design elements along the freeway corridors are coordinated and designed to promote a cohesive identity through colour, materials, patterns and form. These design features include noise attenuation elements, retaining walls, pedestrian bridges, signage and buildings. This coordinated approach creates a consistent, high quality experience for road users and the local community.

20.6 Use resources efficiently

Opportunities are maximised to use materials that are recycled, recovered, have lower embodied energy and are ethically sourced.

7.2 Using design to help manage construction impacts

The project uses design to avoid, minimise and mitigate adverse impacts on the community from temporary works and construction activities.

Construction activity for North East Link includes construction of surface roads, tunnels and structures.

Construction is expected to take around seven years. During this period there will be impacts on the community, environment and local places from temporary and construction works.

Design requirements for temporary and construction works are to be designed and carried out in accordance with the urban design principles and objectives, and this section (7.2), to meet the Environmental Performance Requirement (EPR LV2).

Maintaining access and connections

Alternative pedestrian and cycling routes are redirected and clearly signed. Wayfinding during the construction is addressed as part of the overall wayfinding approach for the project.

Accessible, relatively direct and safe connections are provided around construction activities. CPTED principles are applied to reinforce perceptions of safety. Connections address any amenity impacts on the user experience.

Maintaining community functions

Temporary signage and directional signs is provided to give information and directions to businesses and community facilities affected by construction activities.

Accessibility requirements ensure access is maintained to community facilities and functions during construction.

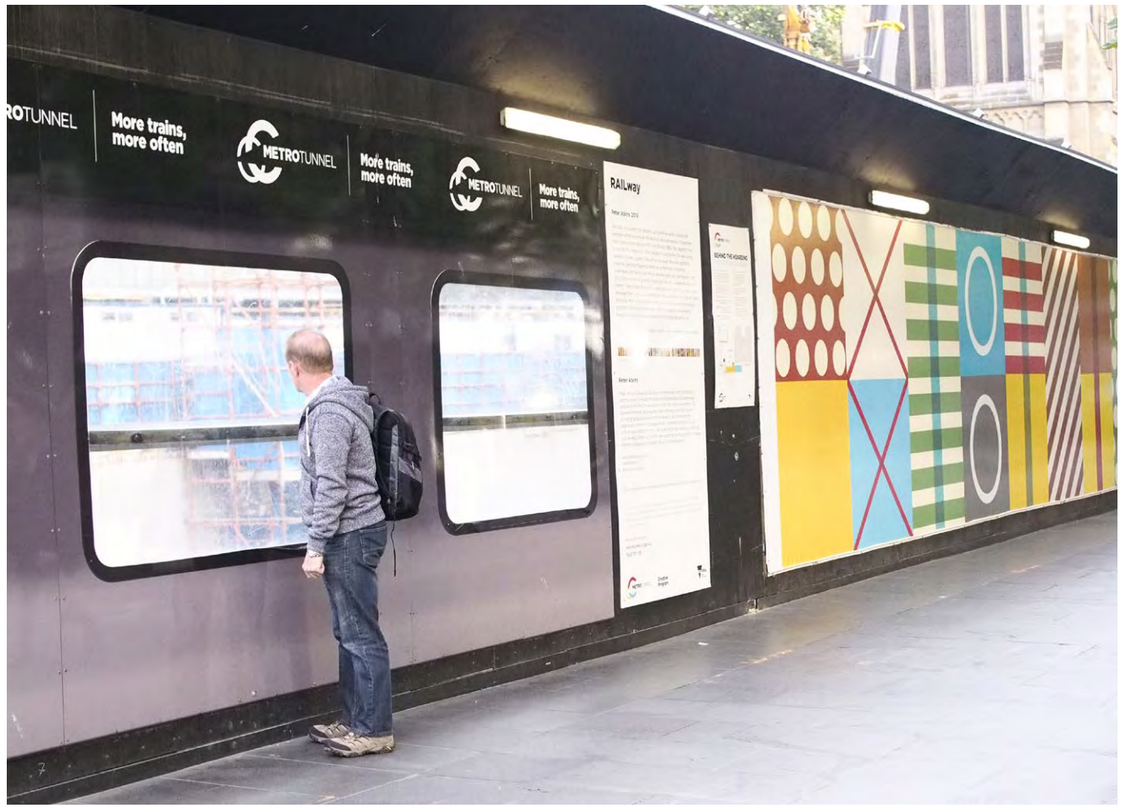
Protecting viability and amenity

Opportunities for the location of temporary works sites and temporary infrastructure to add value (post construction) and be compatible with future land uses are maximised.

Temporary works are sited and designed to avoid or minimise amenity impacts on the local community and adverse visual impact of project works and provide visual appeal.

Protecting features

Memorials, plaques, monuments and artworks are protected and/or temporarily removed, restored and reinstated as appropriate, and in consultation with relevant stakeholders.



Metro Tunnel hoardings with windows to allow views of construction

Construction screen with live planting as part of Green Green Screen project in Japan
Design: Klein Dytham Architecture

Temporary information hub contributes positively to the public realm and invites the community to participate
Image: LXRP

Landscaping

Early landscape buffer and tree planting is used to optimise growth and ability to enhance amenity and provide visual screening (where practical and appropriate).

Temporary uses

Temporary uses, events and pop-up public spaces can be used to offset the impact of construction activities.

Visual impacts & presentation

Enclosures, hoardings and screens are designed to address the type of activity and the distance from which they will be viewed (e.g. whether seen at close range by pedestrians or at high speed from a road).

The quality of enclosures, hoardings, screens and temporary features increase in proportion to the time they will be present on site. They are neat, respect the character of their setting, assist in minimising graffiti, bill-posting and unauthorised material.

Waste generation & reuse

Opportunities for the retention and/or reuse of excavated materials, site materials, elements and any trees removed as part of the project.

Temporary landscape treatments, features or screening are reused across the project, where appropriate.

Innovation

Innovative initiatives should be used in adopting a beyond business-as-usual approach. For example the integration of emerging practice, design competitions (for temporary uses, art installations etc.) and initiatives developed in collaboration with the local community.

Urban Design Framework Plans

8

URBAN DESIGN FRAMEWORK PLANS

The Urban Design Framework Plans (UDFPs) identify and prioritise key requirements from the UDS that are most relevant to selected precincts along the project alignment. They illustrate a direction as to how the area should develop, having regard to land use, and design opportunities and constraints. The approach to UDFPs has been tailored to suit a performance based approach, with a level of detail suitable for a major infrastructure project.

They provide greater clarity on the urban design outcomes to be achieved, having regard to land use and design constraints and opportunities at the following locations:

- M80 / Greensborough Highway Interchange
- Watsonia Neighbourhood Centre and its surrounds
- Borlase Reserve and Lower Plenty Road Interchange
- Manningham / Bulleen Road Interchange
- Bulleen Road / Eastern Freeway Interchange

The UDFPs are an holistic application of the design elements that comprise the UDS hierarchy (on page 6). Importantly, they prioritise the significant issues at each precinct and provide further design direction and options. They highlight strategic priorities for movement and connectivity, as well as key land use interfaces and constraints unique to each location's context.

Selected place specific requirements of particular relevance to each UDFP location have been expanded upon to provide a finer grain of detail around the specific locational constraints and opportunities, sensitive uses and interfaces.

Each UDFP also contains an implementation table identifying the key stakeholders and delivery time periods associated with specific actions for greater clarity.

How to read the UDFPs

The UDFPs are to be read in conjunction with all other requirements in the UDS. The project requirements are outlined in the five key chapters of the UDS:

Chapter 3 — Corridor-wide requirements
- Urban design principles and objectives
- Key design directions

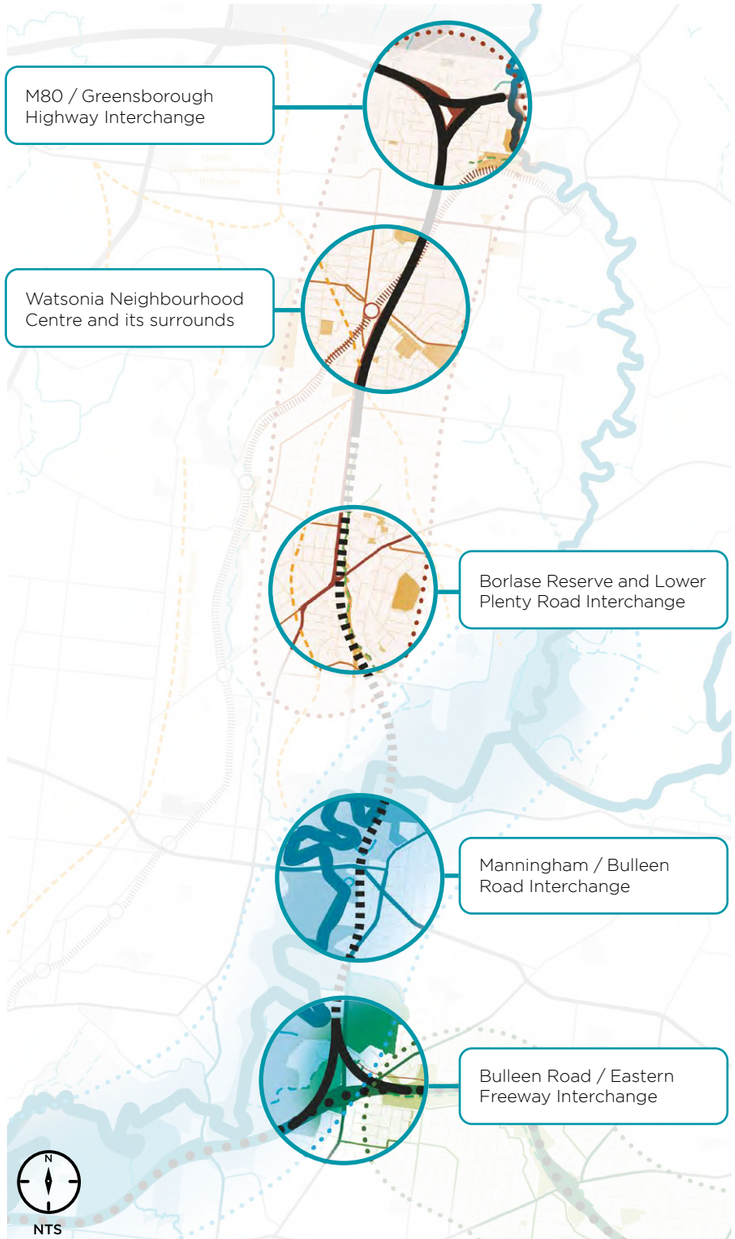
Chapters 4, 5 and 6 — Place-specific requirements

Chapter 7 — Detailed requirements and benchmarks

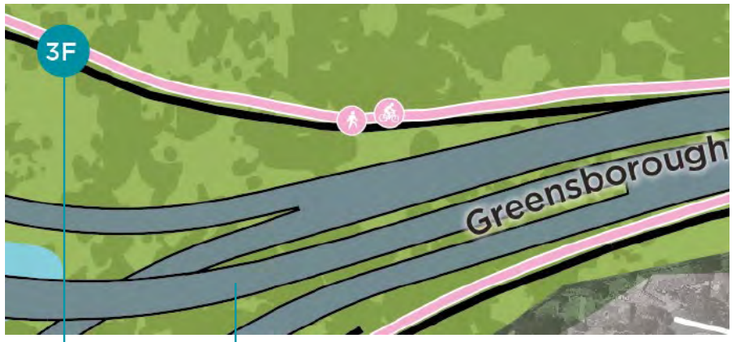
The UDFPs identify key place specific requirements from Chapters 4-6 which are most relevant to each location, and expanded upon with additional information on the opportunities and constraints, and further context. This is intended to guide detailed design, and ensure that landscape and visual impacts on these sensitive areas are minimised.

For the purpose of the UDFPs an indicative functional layout and accompanying illustrative sections have been used to demonstrate one feasible means by which the project could be designed. This design as shown in the UDFPs is generally based on either the Environment Effects Statement (EES) Map Book or amended plans tabled through the Inquiry and Advisory Committee (IAC) process. The location of shared use paths, pedestrian and cycle paths is generally in accordance with the remainder of the UDS. It is to be noted that as this is a functional layout, it is possible that an equivalent and acceptable level of connectivity could be achieved in an alternative manner. In order to be in accordance with the UDS, the final design does not need to reflect the particular design as depicted in the illustrative sections and functional layout. As the design and consultation with stakeholders for the project is ongoing, components of the project design as shown may change.

The final design must be in accordance with all of the place-specific requirements in the Urban Design Strategy.

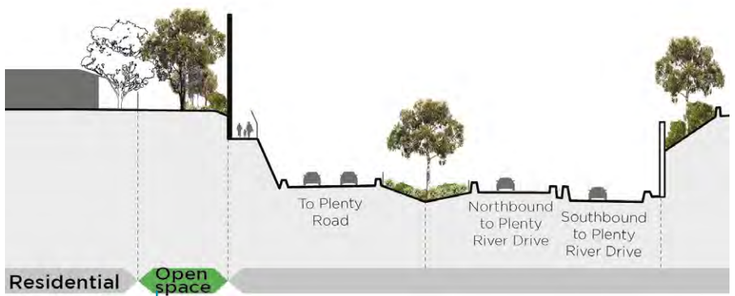


The five UDFP locations



Grey represents an indicative functional road layout and is subject to change. The final project design does not have to reflect this particular layout, in order to be in accordance with the UDS.

Aqua dots refer to the existing Place-specific requirements in the UDS, which have been expanded upon through the UDFPs as key place-specific requirements due to their particular relevance.



Illustrative sections are indicative only and subject to change. The final project design does not have to reflect this particular layout in order to be in accordance with the UDS.

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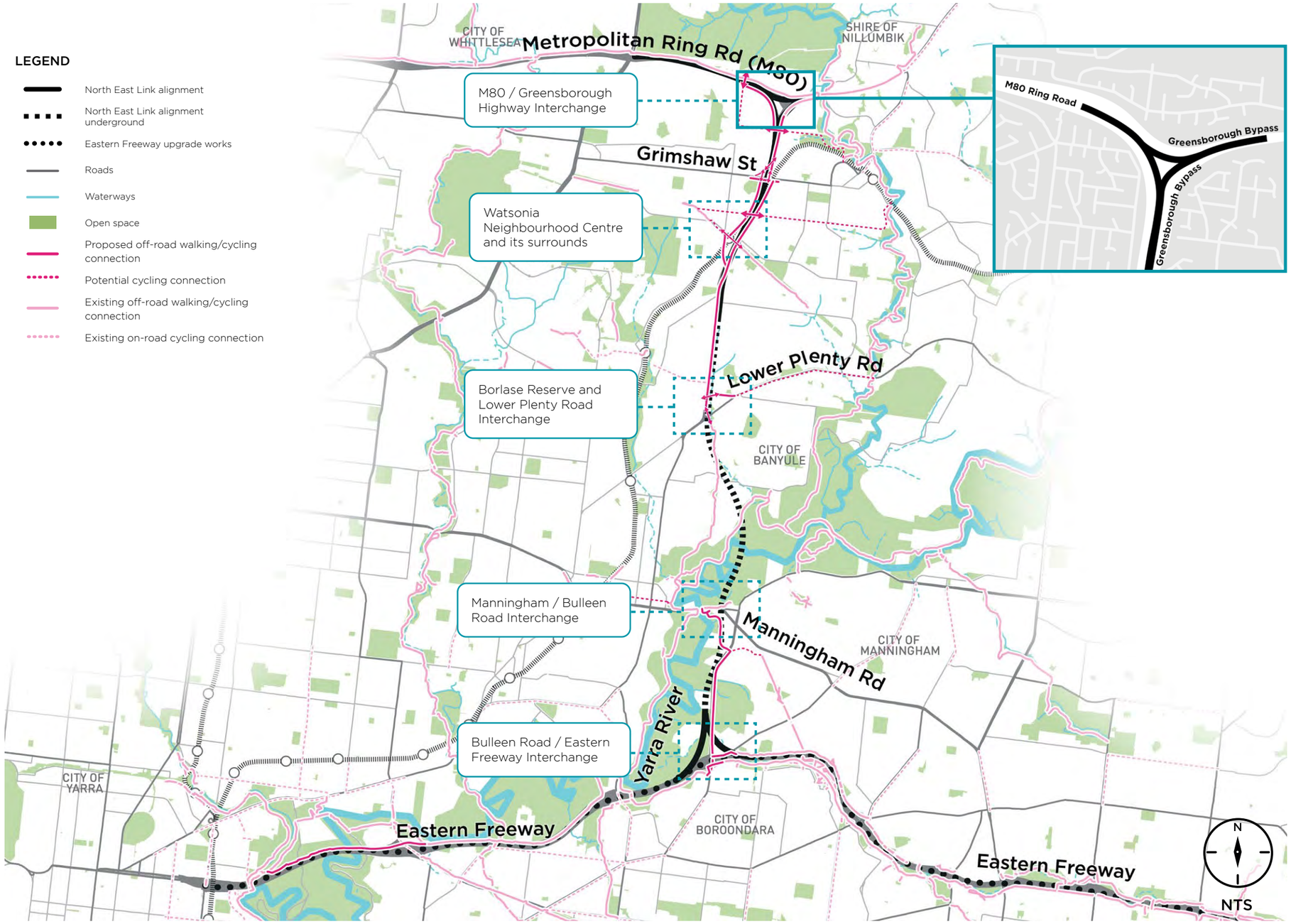
8.1 M80/ GREENSBOROUGH HIGHWAY INTERCHANGE

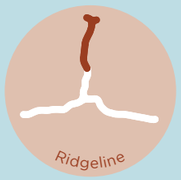
Functional summary

Upgrade and connection to the existing M80 interchange, providing for all movements between M80, Greensborough and North East Link.

LOCATION PLAN



Ridgeline Design Character Area



FRAMEWORK PLAN

Design intent

Ensure the road footprint is minimised, integrated with its residential surrounds to reduce visual impacts and improves pedestrian and cyclist connectivity along and across the corridor.

LEGEND

- Potential new roads
- Existing roads
- Noise wall
- Waterways
- Open space / landscaped area
- Proposed off-road walking/cycling connection
- Proposed walking/cycling crossing link
- Potential cycling connection
- Existing off-road walking/cycling connection
- Pedestrian desire line
- Existing bus stops

Plan is based on EES Mapbook Sheet 19 - 05 March 2019. It is indicative only and subject to change. The final project design does not have to reflect this particular layout in order to be in accordance with the UDS.

M80

DESIGN AND DEVELOPMENT PRIORITIES

While all UDS Principles, Objectives and Key Directions apply, the following are most relevant for this location and form the design and development priorities.
These design and development priorities must be addressed within the Urban Design and Landscape Plans.

Key Principles & Objectives

PRINCIPLE 1

IDENTITY

Objective 1.4
Existing landscape character

Provide a high quality design outcome that responds sensitively to the distinctive character of this part of Melbourne, takes advantage of existing landmarks and vegetation, views and significant places, protects landscape and vegetation, and seeks to enhance the way in which people experience and interact with the landscape.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

Undulating topography and sensitive residential interfaces around the M80 interchange require a landscape-led design approach that reinforces the status of the interchange as a primary node, integrates the ramps and structures into the landscape and sensitively incorporates both vegetation and functional elements.

PRINCIPLE 2

CONNECTING & WAYFINDING

Objective 2.1
Connectivity

Improve people's ability to move through the immediate and wider area with ample, efficient and quality links across and along the corridor for all transport modes, including pedestrians and cyclists.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

The M80 interchange has several bridges and underpasses (Macorna Street, Yando Street and Plenty Gorge) to cross the freeway but would greatly benefit from new pedestrian and cycling paths to link them together. Crossings at Yando Street and Macorna Street are narrow with low passive surveillance, in certain areas. There is an opportunity for new underpasses and overpasses that replace any existing crossings to be designed to increase usage and improve safety.

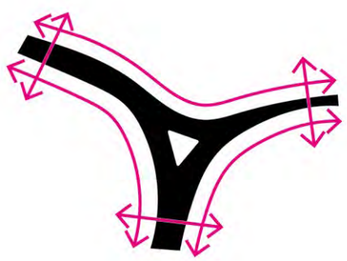


Diagram demonstrating cross corridor connectivity for pedestrians and cyclists at the M80 interchange

PRINCIPLE 3

URBAN INTEGRATION

Objective 3.2
Integration of design

Ensure an integrated engineering, urban design, architectural and landscape architectural approach that sensitively addresses social, cultural, functional and physical aspects of the project.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

The increased complexity of roads at the M80 interchange requires a multi-disciplinary approach that results in well-proportioned elevated structures with minimal visual impact, clear wayfinding for drivers and an attractive environment for all.

Objective 3.4
Minimise footprint

Minimise negative impacts on the community and the environment by minimising the design footprint and visual bulk.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

The large reserve of land at the M80 interchange presents a significant opportunity to minimise the footprint of the road infrastructure and maximise open space for improved environmental values and the enjoyment and usage by the local community and drivers.

PRINCIPLE 4

RESILIENCE & SUSTAINABILITY

Objective 4.3
Environmental sustainability

Optimise environmental performance and embed sustainability initiatives into the design response. This includes integrated water management, biodiversity and habitat enhancement and connections, green infrastructure provision and sustainable use of energy and materials.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

Land adjacent to and under the new road structures at the M80 interchange presents the opportunity to improve amenity and environmental values of the local area through initiatives such as functional water bodies and indigenous planting.

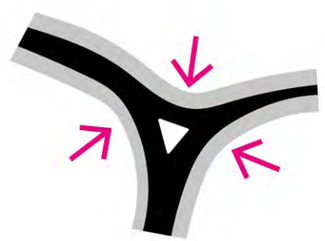


Diagram demonstrating minimisation of the road footprint (Illustrating Principle 3.4)

Key Directions

KEY DIRECTION 1
Develop an integrated design response

Excerpt from 3.2 Key design directions

- Integrate noise walls and fascia solutions
- Consider topography both inside and outside of the interchange in formulating the design of infrastructure
- Provide a design that is sensitive to the surrounding residential areas

KEY DIRECTION 2
Support a natural and connected corridor

Excerpt from 3.2 Key design directions

- Stitch communities together across the project corridor and improve access to key facilities and destinations such as the Plenty River.

KEY DIRECTION 5
Create a context sensitive design

Ridgeline

2.R Connect neighbourhoods, reduce fragmentation and facilitate the continued integration of the diverse community in this area

3.R Reinforce the distinct and unique treed ridgeline character of Melbourne's north-east

4.R Ensure built form associated with the project responds to the urban setting and seeks innovative ways to integrate infrastructure with a djacent land uses.

7.R Provide an architectural and landscape response that integrates seamlessly with the upgraded M80 Ring Road

Excerpt from 3.2 Key design directions

M80

KEY PLACE-SPECIFIC REQUIREMENTS

All place-specific requirements (including those listed below) must be met and addressed within Urban Design and Landscape Plans (refer page 5 section 1.5).
The place-specific context and opportunities provide finer grain detail for these requirements and identify additional opportunities that could be delivered.

2C Maintain and enhance an east-west walking and cycling connection across the corridor between Yando and Hakea Streets. Any new east-west cycle crossing must connect with the Greensborough Bypass Trail.

4.2 Existing Place-specific requirement - Map R2 - M80 Interchange

Place-specific context and opportunities

The existing Yando and Hakea Street underpass below Greensborough Highway provides a walking and cycling connection between the residential areas in Watsonia North and Greensborough.

The widening of Greensborough Highway would potentially lengthen an already long and narrow underpass. A cross corridor connection at this location is complex due to the corridor span, existing topography and adjacent land uses.

The design must address the three-dimensional aspects of the site to ensure pedestrian and cyclist safety, reduce travel distances by providing direct and convenient links, and maximise clear lines of sight.

Refer to Chapter 7 — Detailed requirements & benchmarks

DETAILED REQUIREMENTS

14. Walking & cycling bridges

15. Walking & cycling underpasses

3A Create a high quality navigational feature at the M80 Ring Road interchange to address the road environment while reducing the visible impact towards adjoining residential areas..

4.3 Excerpt from existing Place-specific requirement - Map R2 - M80 Interchange

Place-specific context and opportunities

The M80 interchange would mark the transition between the M80 Ring Road, Greensborough Highway and the North East Link. It represents a threshold between the City of Banyule and the Shire of Nillumbik. Key Direction 4 designates the interchange as a primary node.

With these attributes, the design must act as a navigational feature, using a well-considered landscape response that integrates landform and infrastructure through grading and water treatment options.

DETAILED REQUIREMENTS

1. Multi-span bridges

16. Navigational nodes & thresholds

17. Landscape

3F Re-establish vegetation on the embankment and between paths around the M80 Ring Road interchange to filter and screen views towards road infrastructure from residential areas and walking/cycling paths.

4.3 Existing Place-specific requirement - Map R2 - M80 Interchange

Place-specific context and opportunities

Shared use paths exist or are proposed to be located between the M80 interchange and adjacent residential areas. New noise walls are proposed in similar areas. Landscaping and landscaped embankments are required, to improve the environment for pedestrians and cyclists, and filter views from residences to road infrastructure.

In places, the open space corridor containing the shared use path and landscaping would be tightly constrained between the noise walls and residential boundaries.

The design must appropriately resolve these conflicting demands for space, maximising open space and its functionality, and addressing views from both the community side and the road side. Considerations would include the location and height of noise walls and their acoustic efficiency relative to the noise source and receiver.

DETAILED REQUIREMENTS

7. Public Open Space

9. Walls, fencing, barriers & screens

13. Walking & cycling infrastructure

17. Landscape

Minimum walking and cycling connection requirements

East-west connections:

- Across North East Link and Greensborough Bypass near Hakea Street / Yando Street in the form of a grade-separated crossing

North-south connections:

- Across M80 Ring Road at Macorna Street in the form of a grade-separated crossing
- Along the west side of North East Link from Hakea Street to Macorna Street in the form of a new shared use path

M80

KEY BENCHMARKS

The key benchmarks below illustrate specific treatments or approaches which demonstrate potential design outcomes relevant to the final design in this location as described in text below.

FIGURE 89 Refer key place-specific requirement 3A. Demonstrates: an interchange celebrated as a gateway which assists with navigation in a complex interchange. M80, Melbourne. *Design: Peter Elliott and VicRoads, Photography: John Gollings*

FIGURE 90 Refer Objective 3.2. Demonstrates: well considered multi span steel trough bridge with articulated piers and integral crosshead. M80 Ring Road, Melbourne. *Design: Peter Elliott and VicRoads, Photography: John Gollings*

FIGURE 91 Demonstrates: use of climber to screen infrastructure. Melbourne Park car park, Melbourne. *Image: Isabelle Verschueren*

FIGURE 92 Refer Objective 4.3. Demonstrates: constructed wetland and vegetated embankment. EastLink, Melbourne. *Design: Wood Marsh and Tract Consultants, Image: EastLink*

FIGURE 93 Refer Objective 4.3. Demonstrates: context sensitive Water Sensitive Urban Design. Leopold, Melbourne. *Design: GHD*

FIGURE 94 Demonstrates: a landscape design that responds to the high speed viewing environment through the use of terraced planting. CityLink, Melbourne. *Design: EDAW, Image: GHD*

FIGURE 95 Demonstrates: well considered tree boulevards with innovative infrastructure. BP Pedestrian Bridge, Chicago. *Design: Frank Gehry, Image: Millennium Park Foundation*

FIGURE 96 Demonstrates: integrated pedestrian bridge with noise walls to create a gateway that frames Melbourne's skyline. Craigieburn Bypass, Melbourne. *Design: Taylor Cullity Lethlean, Tonkin Zulaikha Greer Architects and Robert Owen, Image: VicRoads*

FIGURE 97 Demonstrates: use of natural light and a generous proportioned underpass. Bowen Place Crossing, Canberra *Design: Lahz Nimmo Pty Ltd and Spackman Mossop Michaels, Photography: Brett Boardman*

FIGURE 98 Refer Objective 4.3. Demonstrates: buffer planting and mounds filter views from residential areas. Koonung Creek Reserve, Melbourne. *Image: NELP*

FIGURE 99 Demonstrates: robust and sustainable roadside planting. Eastern Freeway, Melbourne. *Design: VicRoads, Wood Marsh and Tract Consultants, Image: NELP*

FIGURE 100 Refer Objective 4.3. Demonstrates: interchange acting as a navigational node with the integrated built form sensitively sited in the landscape. M80 / Princes Interchange, *Image: Vic Roads*

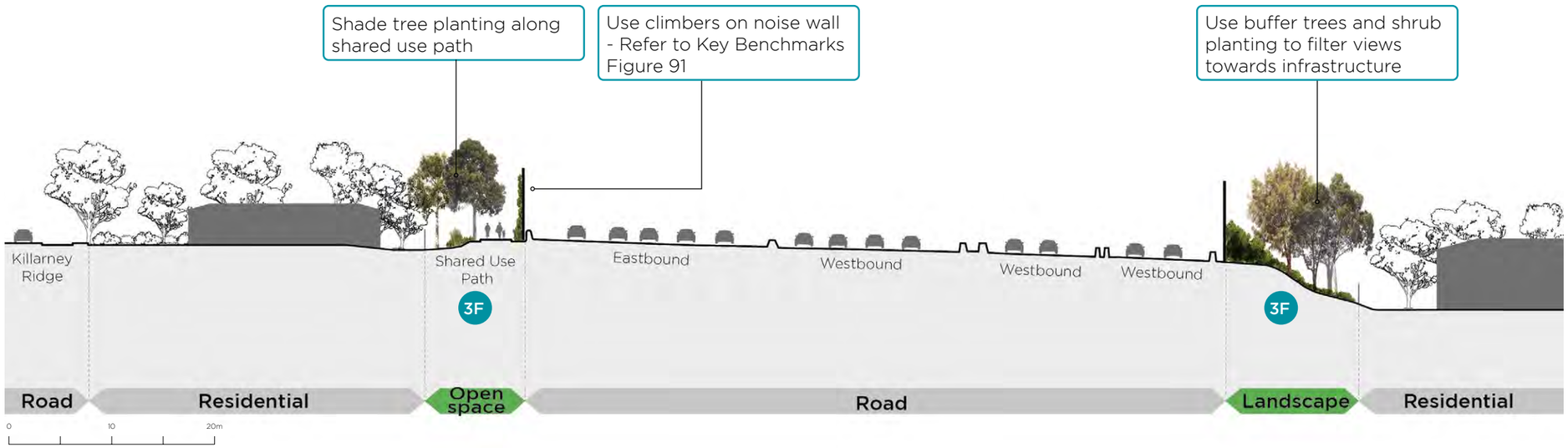
FIGURE 101 Demonstrates: a cable stay pedestrian bridge that is responsive to the surrounding context. Thompson River, Sale. *Design: VicRoads, Image: GHD*

FIGURE 102 Demonstrates: semi-enclosed transparent noise wall to reduce visual bulk and allow light into the adjacent creek. Eastern Freeway, Melbourne. *Design: Wood Marsh*

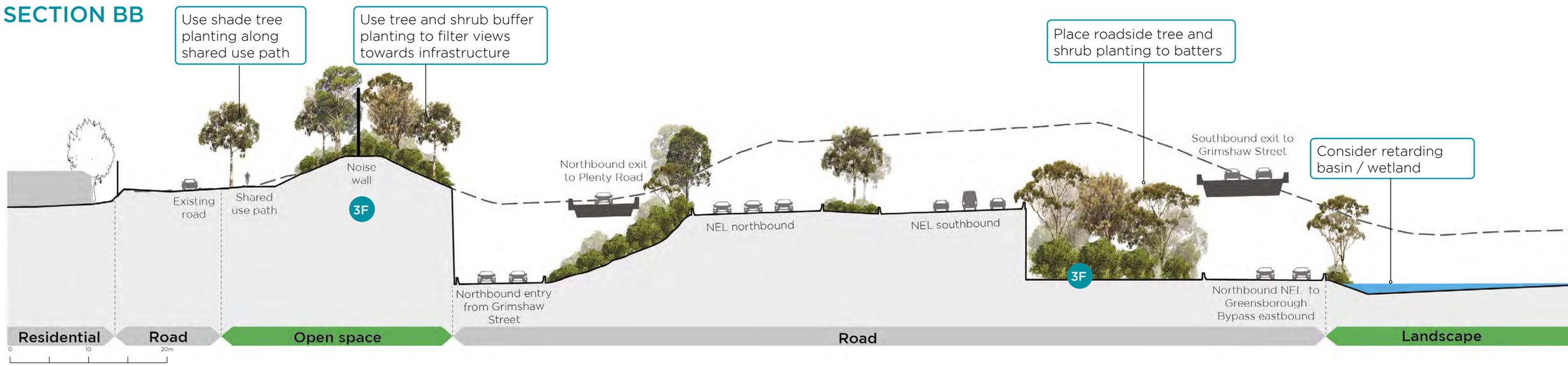
ILLUSTRATIVE SECTIONS

Illustrative sections are indicative only and subject to change. The final project design does not have to reflect this particular layout in order to be in accordance with the UDS.

SECTION AA

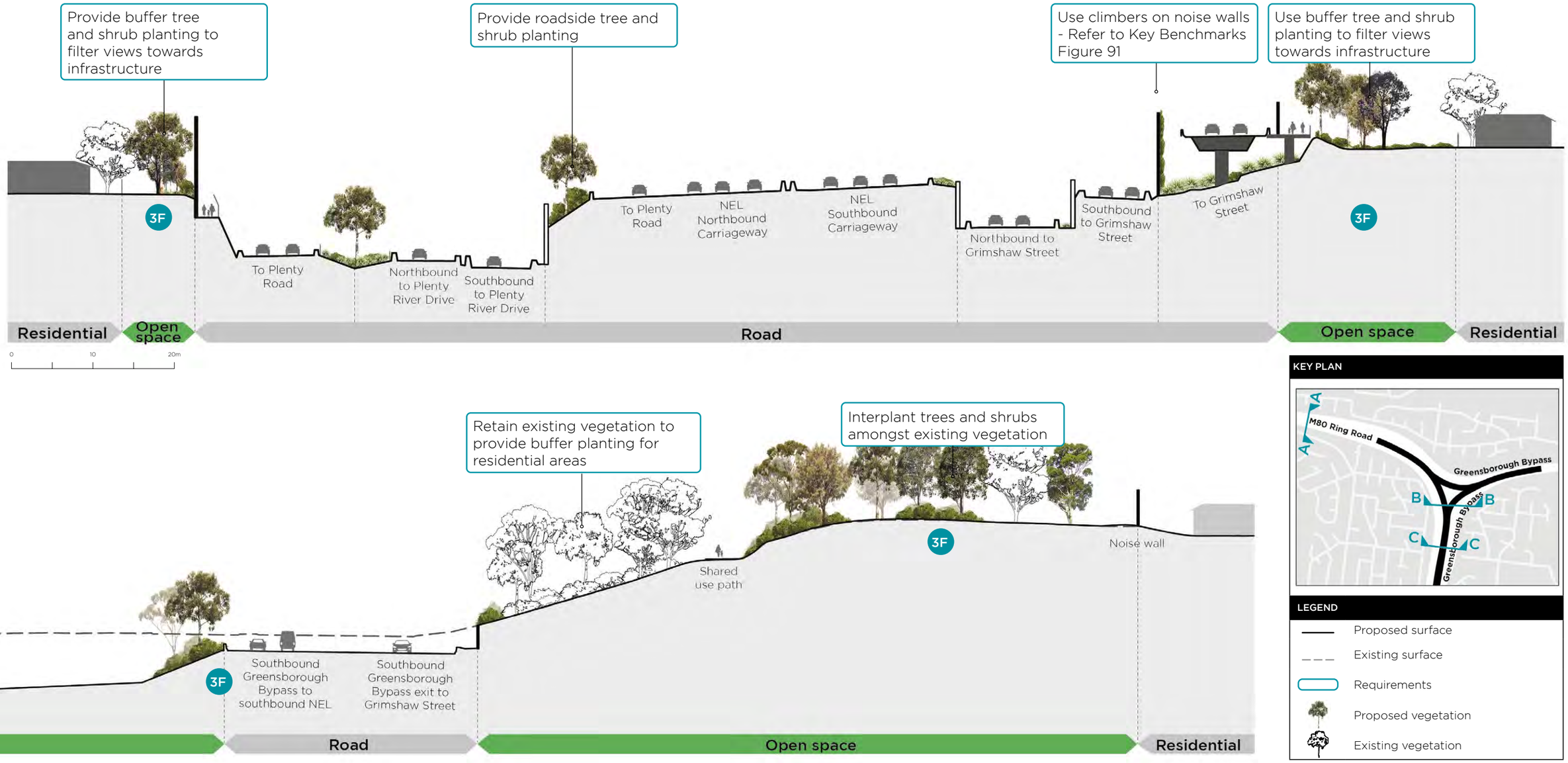


SECTION BB



M80

SECTION CC



M80

ACTION PLAN & IMPLEMENTATION STRATEGY

Key components to be developed by the Project

The table below contains the key place-specific requirements identified by stakeholders including the NELP Urban Design Advisory Panel and Councils, and will be delivered by the Project. Whilst these key requirements are considered most relevant to this precinct, the final design must be in accordance with all of the place-specific requirements in the Urban Design Strategy. The broader infrastructure elements for delivery have not been included in this table so as not to limit the final design response and allow for innovation.

Summary of key place-specific requirements		Type	Key stakeholders	Delivery timeframe
2C	East-west walking and cycling connection across the corridor between Yando Street and Hakea Street which connects into the Greensborough Bypass Trail.	Walking and cycling connection	DTP, Banyule	During construction
3A	Creation of a high quality navigational feature.	Navigational feature	DTP, Banyule, Nillumbik	During construction
3F	Re-establishing vegetation to filter and screen views towards road infrastructure.	Landscaping	DTP, Banyule, Nillumbik	During construction (Final stages of construction)

M80 Interchange Table 1 - Implementation Plan

Opportunities for development or upgrades by others

The table below lists opportunities and proposals for the surrounding precinct that could be developed or upgraded by others. This list includes relevant draft and approved local and state government plans / strategies or key opportunities (by others) identified through the EES process.

Opportunity	Reference
Northern Regional Trails Strategy, Councils of Banyule, Darebin, Hume, Moreland, Nillumbik and Whittlesea, 2016 The proposed Aqueduct Trail is a high short term priority trail project for Nillumbik Council. Section N2a of the trail would provide a link from the Metropolitan Ring Road, through Diamond Creek to the existing Banyule Diamond Creek trail.	Web link: www.nillumbik.vic.gov.au/files/assets/public/council/council-publications/strategies-etc/northern-regional-trails-strategy.pdf

M80 Interchange Table 2 - Opportunities for implementation by others

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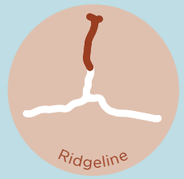
8.2 WATSONIA NEIGHBOURHOOD ACTIVITY CENTRE AND SURROUNDS

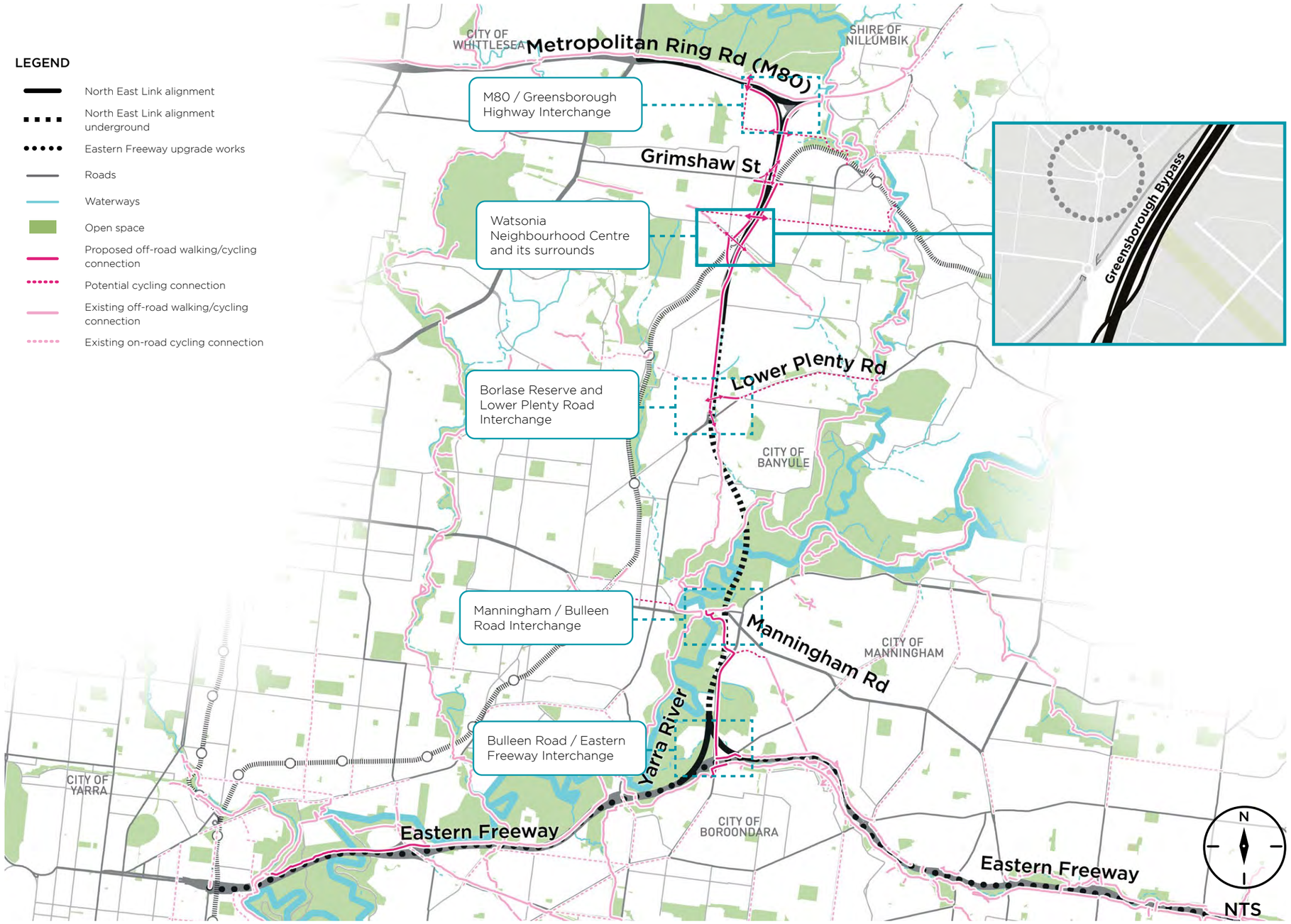
Functional summary

North East Link would pass to the east of the Watsonia Neighbourhood Activity Centre, including a direct connection between Elder Street, Greensborough Highway and the station carparkcrossings for pedestrians and bike riders to the station and shops, better links for local buses, and improved car parking at Watsonia station.

Ridgeline Design Character Area



LOCATION PLAN

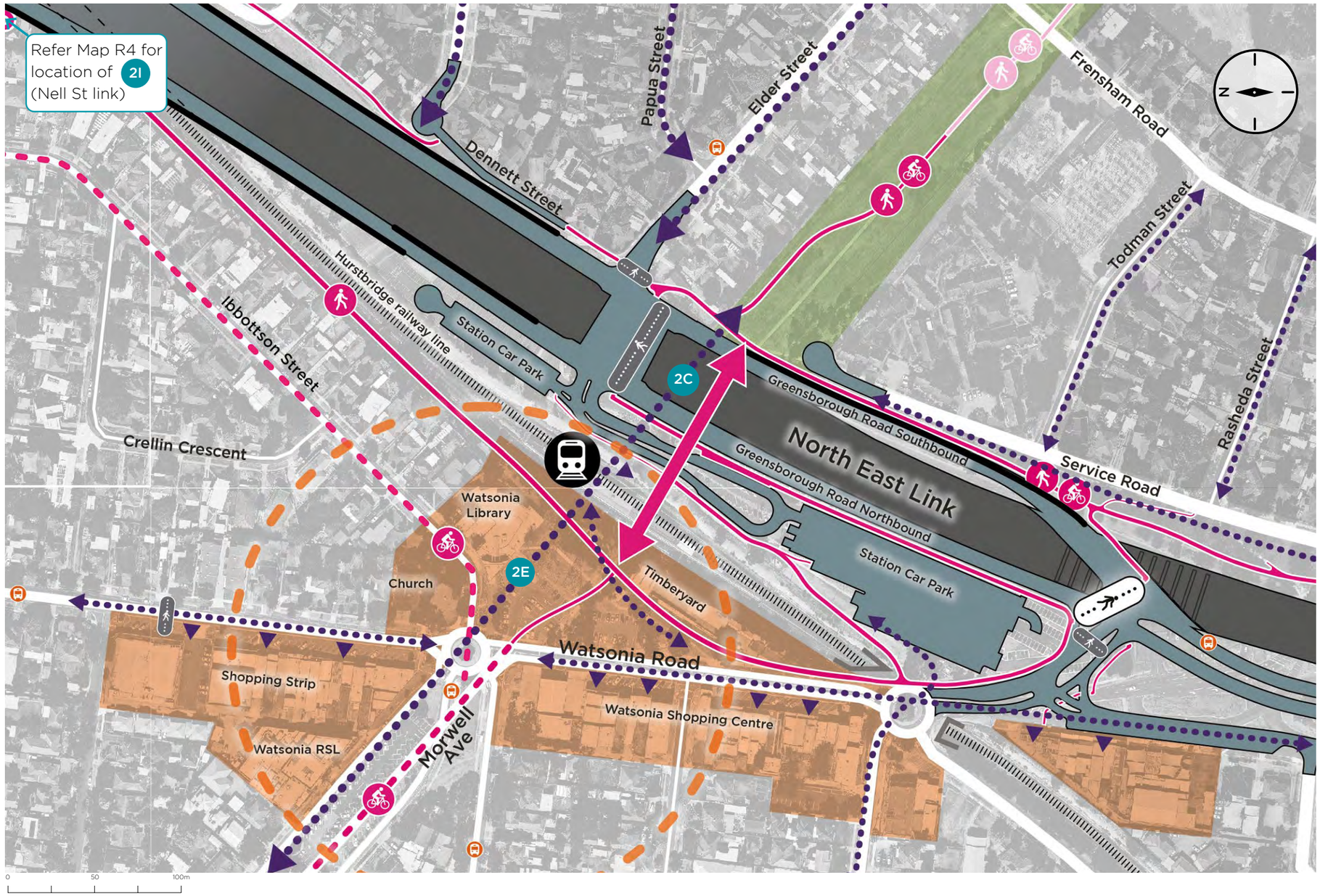


WATSONIA

FRAMEWORK PLAN

Design intent

Improve amenity and connectivity across the transport corridor for greater integration of the Watsonia Neighbourhood Activity Centre.
Maintain access to and minimise impacts on the operation of Watsonia Activity Centre during construction.



LEGEND

- Potential new surface roads
- Potential new road trench
- Existing commercial or non-residential properties
- Existing roads
- Noise wall
- Open space / landscaped area
- Pedestrian desire line
- Proposed off-road walking/cycling connection
- Proposed walking/cycling crossing link
- Potential cycling connection
- Existing off-road walking/cycling connection
- Proposed signalised crossing
- Existing signalised crossing
- Watsonia Train Station
- Existing bus stop
- Activity centre

Plan is based on the IAC tabled document 100 - NELP Technical Note R32 Watsonia alternate design Elder Street - 29 July 2019. It is indicative only and subject to change. The final project design does not have to reflect this particular layout in order to be in accordance with the UDS.

WATSONIA

DESIGN AND DEVELOPMENT PRIORITIES

While all UDS Principles, Objectives and Key Directions apply, the following are most relevant for this location and form the design and development priorities.
These design and development priorities must be addressed within the Urban Design and Landscape Plans.

Key Principles & Objectives

PRINCIPLE 2

CONNECTING & WAYFINDING

Objective 2.1
Connectivity

Improve people's ability to move through the immediate and wider area with ample, efficient and quality links across and along the corridor for all transport modes, including pedestrians and cyclists.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

The Watsonia precinct would benefit from additional walking and cycling paths along and across the existing Greensborough Road corridor, to better connect residential areas, schools, shops and public transport.

Vehicle access to the Watsonia activity centre is particularly important for traders, both during and after the construction of the North East Link.

Objective 2.2
Transport integration

Maximise the benefits of the project by facilitating seamless access to a variety of public transport, walking and cycling choices as part of a connected intermodal network.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

Access for pedestrians, cyclists, public transport users and drivers to the Watsonia train station and buses is functional but low quality. Pedestrian access through the station car park is not pedestrian friendly. The arrangement of car parks at the station is spatially inefficient. The design must improve the pedestrian experience for public transport users.

PRINCIPLE 3

URBAN INTEGRATION

Objective 3.1
Integration with context

Avoid, minimise and mitigate any severance of communities. Provide a well-integrated corridor environment that enhances the street network and takes advantage of opportunities to connect and integrate with the broader commercial, residential and open space functions and environment.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

Severance is a significant issue in the local area with Greensborough Road and the rail corridor creating a barrier for drivers, cyclists and pedestrians. The project must address this severance and better connect the activity centre with the surrounding area.

Objective 3.3 Strategic alignment

Provide an integrated transport infrastructure and land use solution that responds to strategic transport and land use planning for the broader precinct in consultation with local government and authorities.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

The long-term vision for Watsonia activity centre is being addressed by the City of Banyule. The North East Link project provides an opportunity to make a positive contribution to this vision, through design elements that help realise the objective of a people-friendly neighbourhood village with a strong sense of place.

PRINCIPLE 5

AMENITY

Objective 5.1
Improved amenity

Enhance urban amenity through a highly considered and site-specific response to realise opportunities and address challenges to create better places for people.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

Public open space throughout the precinct is currently of low quality and low amenity. Improved amenity is a key objective for the project, to ensure that any new public open spaces make a positive contribution to the area. This includes any improvements to the activity centre where walking and cycling upgrades are being undertaken.

Diagram demonstrates improved amenity along Greensborough Road and around the Watsonia precinct

PRINCIPLE 8

ACCESSIBILITY

Objective 8.2
Twenty-minute neighbourhoods

Support and enhance 20-minute neighbourhoods for convenient and desirable access to everyday services and facilities (within a 20-minute walk from their home, or faster by bicycle or local public transport).

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

The State Government has outlined an objective, in Plan Melbourne, to develop 20 minute neighbourhoods. To achieve this objective, the project would maximise the walking catchment to Watsonia activity centre by providing direct, frequent pedestrian links across and along the project corridor.

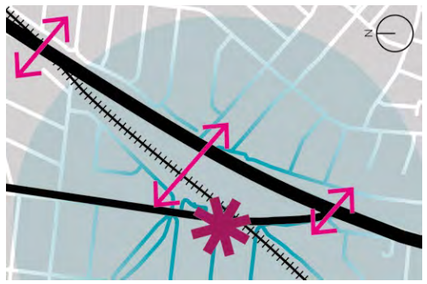


Diagram demonstrates an increased walking catchment to the Watsonia Neighbourhood Activity Centre, with improved connectivity to the east of Greensborough Road

Key Directions

KEY DIRECTION 1

Develop an integrated design response

Excerpt from 3.2 Key design directions

- Maximise opportunities for transport and land use integration at Watsonia Neighbourhood Activity Centre

KEY DIRECTION 2

Support a natural and connected corridor

Excerpt from 3.2 Key design directions

- Improve connectivity across and along the transport corridor to address existing severance.

KEY DIRECTION 5

Create a context sensitive design

Ridgeline

2.R Connect neighbourhoods, reduce fragmentation and facilitate the continued integration of the diverse community in this area

3.R Reinforce the distinct and unique treed ridgeline character of Melbourne's north-east

4.R Ensure built form associated with the project responds to the urban setting and seeks innovative ways to integrate infrastructure with adjacent land uses.

7.R Provide an architectural and landscape response that integrates seamlessly with the upgraded M80 Ring Road

9.R Provide enhanced connections to the La Trobe National Employment and Innovation Cluster (La Trobe NEIC)

Excerpt from 3.2 Key design directions

EPRs and Section 7.2 of the UDS require that the project uses design to minimise and mitigate adverse impacts on the community from temporary works and construction activities. This issue is particularly important for the community and traders associated with Watsonia activity centre.

WATSONIA

KEY PLACE-SPECIFIC REQUIREMENTS

All place-specific requirements (including those listed below) must be met and addressed within Urban Design and Landscape Plans (refer page 5 section 1.5).
The place-specific context and opportunities provide finer grain detail for these requirements and identify additional opportunities that could be delivered.

2C Provide a new walking and cycling link from the east side of the road corridor across Greensborough Road and connecting to the Watsonia Station and the Watsonia Neighbourhood Centre.

Ensure there are pedestrian connections to Watsonia Station platforms that addresses key desire lines, enhance sightlines, wayfinding and legibility for walking and link to the walking and cycling paths/bridge.

4.3 Existing Place-specific requirement - Map R4 - Watsonia Neighbourhood Centre

Place-specific context and opportunities

Residents living to the east of Greensborough Road currently have limited access to the Watsonia Neighbourhood Centre, with Greensborough Road and the rail cutting acting as barriers for pedestrians and cyclists.

The project provides a significant opportunity to support Plan Melbourne's objective for 20-minute neighbourhoods. This objective could be faciltated by extending the 20 minute walking and cycling catchment of the Watsonia Neighbourhood Centre by increasing permeability across the transport corridor. Developing direct and safe pedestrian and cycling links for increased permeability will require careful consideration of the three-dimensional constraints and complexities of the area.

The high voltage power easement which runs perpendicular to Greensborough Highway presents an opportunity to develop a direct, green link that enhances the connectivity objective and becomes a positive asset for the local community. There are numerous opportunities for this linear open space to be upgraded in the future. Refer Key Benchmark Figure 111 Inner Circle-Janet Millman Reserve.

Refer to Chapter 7 — Detailed requirements & benchmarks

DETAILED REQUIREMENTS

3. Land bridges
4. Open cuttings
7. Public open space
9. Walls, fencing, barrier & screens
12. Lighting
13. Walking & cycling infrastructure
17. Landscape

2E Provide new off-road walking and cycling path in east-west direction to link from Watsonia Road to Watsonia Station.

4.3 Existing Place-specific requirement - Map R4 - Watsonia Neighbourhood Centre

Place-specific context and opportunities

The existing pedestrian path between Watsonia Road and Watsonia station is narrow and low quality, relative to its role in providing access from the station to the shopping strip.

The project must improve the pedestrian experience for residents and commuters, as well as contributing to the civic qualities of the precinct. Key issues include wayfinding, sense of place and development of safe and direct connections through the area.

DETAILED REQUIREMENTS

7. Public open space
13. Walking & cycling infrastructure
17. Landscape

2I Replace existing Nell Street pedestrian bridge with new high quality, wider, walking and cycling crossing that connects the east and west side of the corridor. Crossing is to link into the surrounding path networks and to Watsonia Primary School.

4.3 Existing Place-specific requirement - Map R4 - Watsonia Neighbourhood Centre

Place-specific context and opportunities

The existing pedestrian bridge near Nell Street provides grade-separated access across Greensborough Road between residential areas and local destinations including Watsonia Primary School, Greensborough Secondary College, Concord School, AK Lines Reserve and the Watsonia shopping precinct. The existing pedestrian bridge does not comply with current standards for access and mobility. Public space on the east and west sides of the road corridor is constrained, limiting opportunities to locate stairs and ramps for a replacement bridge.

The design must address the three-dimensional aspects of the site, to place the new crossing in the most appropriate location, prioritise pedestrian and cyclist safety and travel time, and minimise overshadowing of residential areas.

Ensure the design of the Nell Street pedestrian bridge has regard to the setting and operational requirements of Watsonia Primary School.

DETAILED REQUIREMENTS

7. Public open space
9. Walls, fencing, barrier & screens
12. Lighting
13. Walking & cycling infrastructure
14. Walking & cycling bridges
17. Landscape

Minimum walking and cycling connection requirements

East-west connections:

- Across Greensborough Road near Elder Street in the form of signalised at-grade crossings
- Across North East Link near Elder Street in the form of a grade-separated crossing
- Across North East Link near Watsonia Road in the form of a grade-separated crossing

North-south connections:

- Across Elder Street on the east side of Greensborough Road in the form of a signalised at-grade crossing
- Along the east side of Greensborough Road from Grimshaw Street to Blamey Road in the form of a new link

North-south and east-west connections:

- Across and along Greensborough Road near Watsonia Road in the form of signalised at-grade crossing(s)

WATSONIA

KEY BENCHMARKS

The key benchmarks below illustrate specific treatments or approaches which demonstrate potential design outcomes relevant to the final design in this location as described in text below.

FIGURE 103 Refer Objective 3.1. Demonstrates: connectivity of train station to town centre and surrounds. Sandringham Village, Victoria. *Image: NELP*

FIGURE 104 Refer Objective 3.3. Demonstrates: connection to the public realm and integration with the surrounding town centre. Bayswater Station, Melbourne. *Image: LXRP*

FIGURE 105 Demonstrates: extension and connection of open space via a landbridge. The Green Bridge, London. *Design: CZWG Architects LLP, Photography: Philip Lane Photography*

FIGURE 106 Demonstrates: Water Sensitive Urban Design infrastructure and tree planting incorporated into the car park. Henry Turner Oval car park, Melbourne. *Design: GHD*

FIGURE 107 Demonstrates: integration of barriers and handrails. Darebin Yarra Trail, Melbourne. *Design: VicRoads, Photography: Emma Cross*

FIGURE 108 Demonstrates: integrated car park entry. Steele Oval underground car park at Melbourne Grammar, Melbourne. Design: Peter Elliott Architecture + Urban Design. *Image: Peter Elliott*

FIGURE 109 Demonstrates: integrated car park entry. Steele Oval underground car park at Melbourne Grammar, Melbourne. *Design: Peter Elliott Architecture + Urban Design. Image: Peter Elliott*

FIGURE 110 Demonstrates: good quality planting along water easement. St Georges Road, Thornbury. *Image: NELP*

FIGURE 111 Demonstrates: good quality planting along power utility easement. Inner Circle-Janet Millman Reserve, Fitzroy North. *Image: NELP*

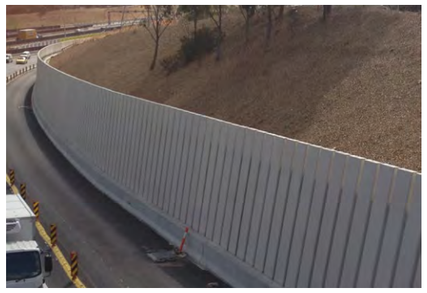


FIGURE 112 Refer Cross-section AA-1. Demonstrates: integration of retaining wall and fencing along a road cutting. M80 Ring Road, Melbourne. *Design: Peter Elliott Architecture + Urban Design. Image: Peter Elliott*

FIGURE 113 Refer Cross-section AA-1. Demonstrates: high quality retaining wall treatment. M80 Ring Road, Melbourne. *Design: Peter Elliott Architecture + Urban Design. Image: Peter Elliott*

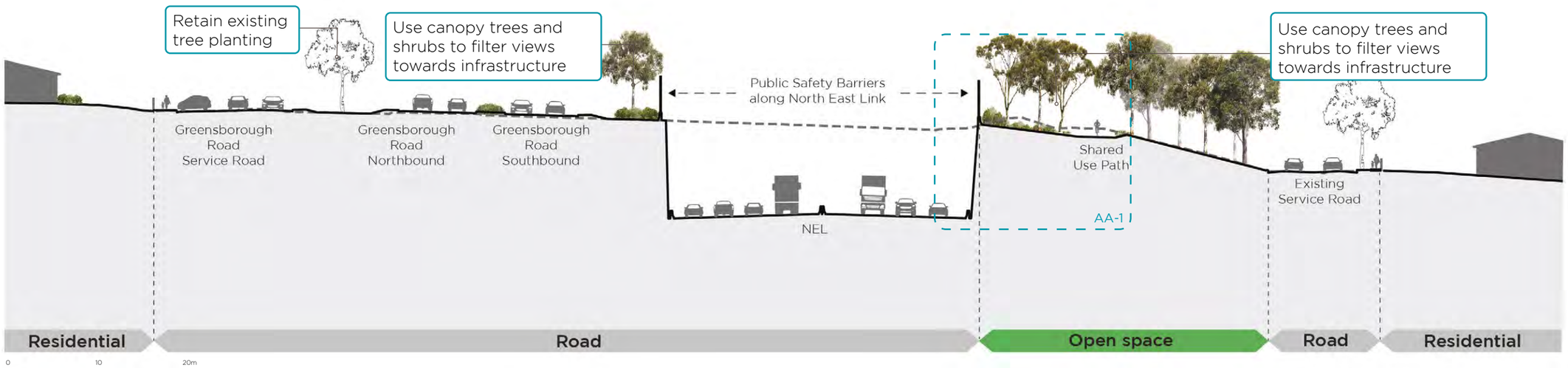
FIGURE 114 Demonstrates: use of existing natural stone in cutting as a design feature. EastLink Freeway, Melbourne. *Design: Wood Marsh and Tract Consultants, Image: EastLink*

FIGURE 115 Demonstrates: use of climber to screen infrastructure. Melbourne Park car park, Melbourne. *Image: Isabelle Verschueren*

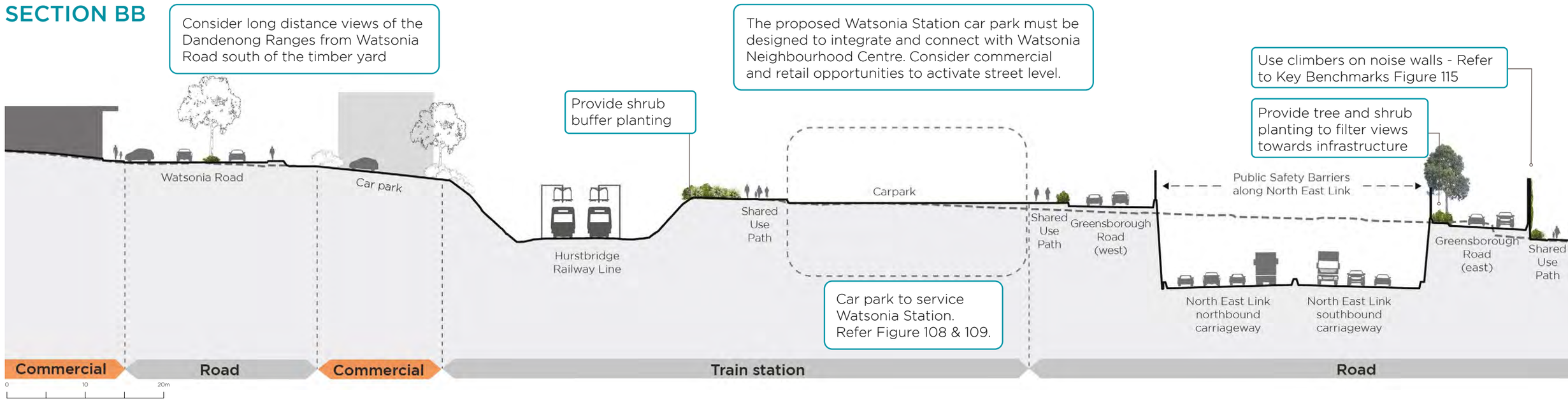
ILLUSTRATIVE SECTIONS

Illustrative sections are indicative only and subject to change. The final project design does not have to reflect this particular layout in order to be in accordance with the UDS.

SECTION AA



SECTION BB



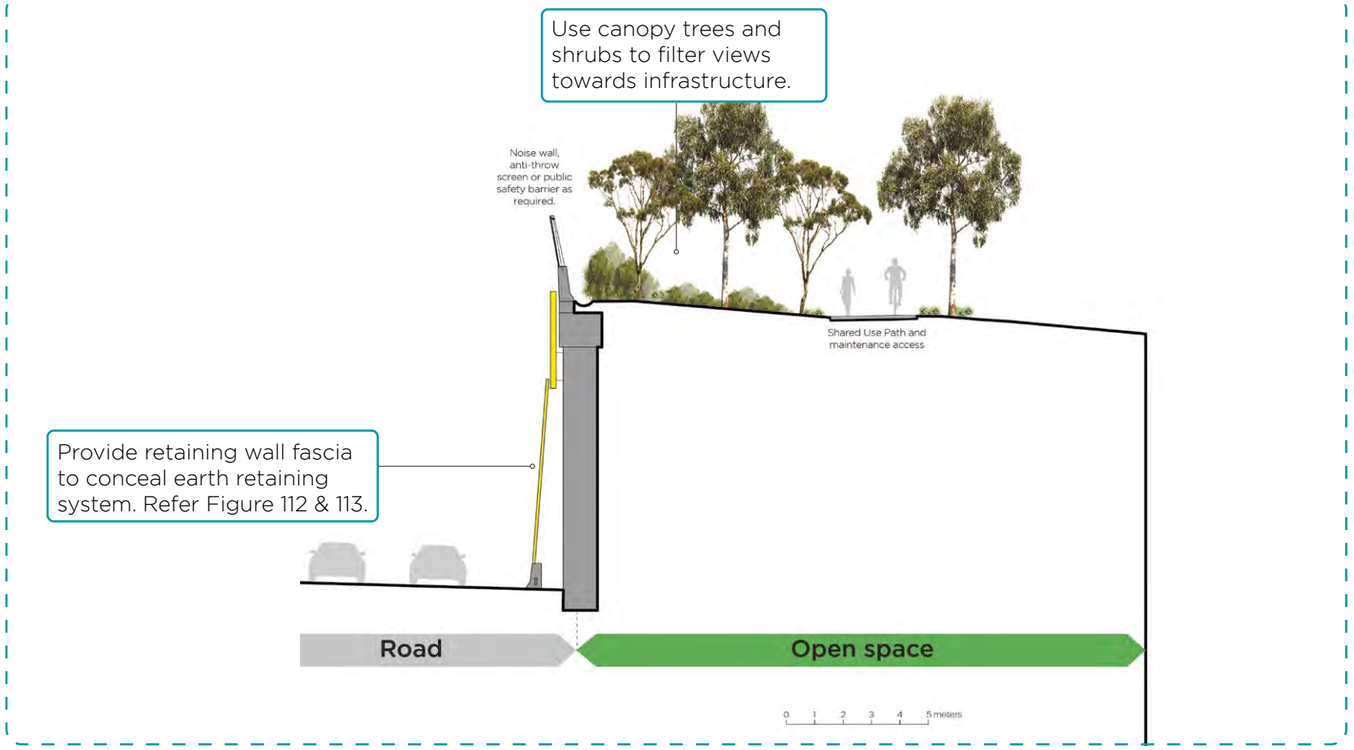
WATSONIA

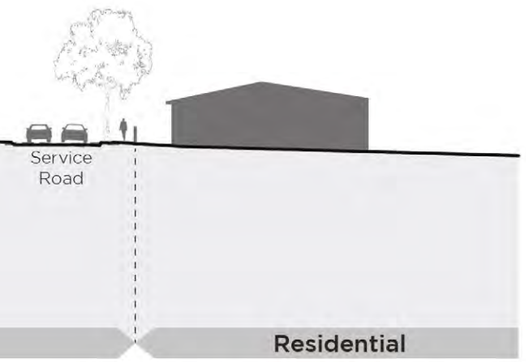
KEY PLAN

LEGEND

- Proposed surface
- Existing surface
- Proposed building
- Requirements
- Proposed vegetation
- Existing vegetation

AA-1 ILLUSTRATIVE CROSS SECTION





ACTION PLAN & IMPLEMENTATION STRATEGY

Key components to be developed by the Project

The table below contains the key place-specific requirements identified by stakeholders including the NELP Urban Design Advisory Panel and Councils, and will be delivered by the Project. Whilst these key requirements are considered most relevant to this precinct, the final design must be in accordance with all of the place-specific requirements in the Urban Design Strategy. The broader infrastructure elements for delivery have not been included in this table so as not to limit the final design response and allow for innovation.

Summary of key place-specific requirements		Type	Key stakeholders	Delivery timeframe
2C	Walking and cycling connection from the eastern side of Greensborough Road and the NELP corridor to the western side of the road corridor	Walking and cycling connection	Banyule, DTP, VicTrack	During construction
2E	Walking and cycling connection from Watsonia Road to Watsonia Station.	Walking and cycling connection	Banyule, DTP, VicTrack	During construction
2I	Replacement of the existing Nell Street pedestrian bridge.	Walking and cycling connection	Banyule, DTP, VicTrack, Watsonia Primary School	During construction

Watsonia Neighbourhood Activity Centre and surrounds Table 1 - Implementation Plan

Opportunities for development or upgrades by others

The table below lists opportunities and proposals for the surrounding precinct that could be developed or upgraded by others. This list includes relevant draft and approved local and state government plans / strategies or key opportunities (by others) identified through the EES process.

Opportunity	Reference
Watsonia Neighbourhood Centre Concept Plan, Ethos Urban, May 2019 • Seek the upgrade of Watsonia Station to provide a legible, accessible entry structure and new pubic space decked across the railway cutting under the powerlines, with future local connections providing for buses and drop-off / pick-up. • Locate the Station access decking directly aligned with the powerlines reserve (rather than at Elder Street) to complete the continuous 'green corridor' as a main structuring element and shared trail, potentially establishing local street links from the east to Watsonia Road. • Develop active public spaces at the southern end of Morwell Avenue and between the Library and the Station. • Focus Council works on traffic calming particularly at roundabouts and intersections, improving pedestrian amenity along Watsonia Road and generally planting more trees.	IAC tabled document 364
Picture Watsonia, A Vision for Watsonia Village, Banyule City Council, December 2014 • Picture Watsonia includes a range of short term, medium term and long term opportunities for Watsonia Village.	IAC tabled document 332d
Banyule Walking Strategy 2018-2028, Banyule City Council, November 2018 • Delivery of the priority recreational paths as identified in the Northern Regional Trails Strategy, 2016 such as the East-West Power Easement Trail (B6). The western side of the proposed trail extends from Plenty Road to Watsonia Road / Railway Station / Greensborough Highway precinct. The eastern side of the proposed trail extends from the Greensborough Highway to the Plenty River Trail.	Web link: www. shaping.banyule.vic.gov.au/banyule-walking-strategy
Potential opportunity to activate the proposed Watsonia Station car park. Depending upon the final design, structure and layout of the car park solution, the following could potentially be implemented: • Street level frontage - presents an opportunity for retail/commercial uses to provide active frontages, contribute to the vibrancy of the precinct and provide passive surveillance. • Rooftop - presents an opportunity for uses such as markets and community events.	Various EES submissions by individuals

Watsonia Neighbourhood Activity Centre and surrounds Table 2 - Opportunities for implementation by others

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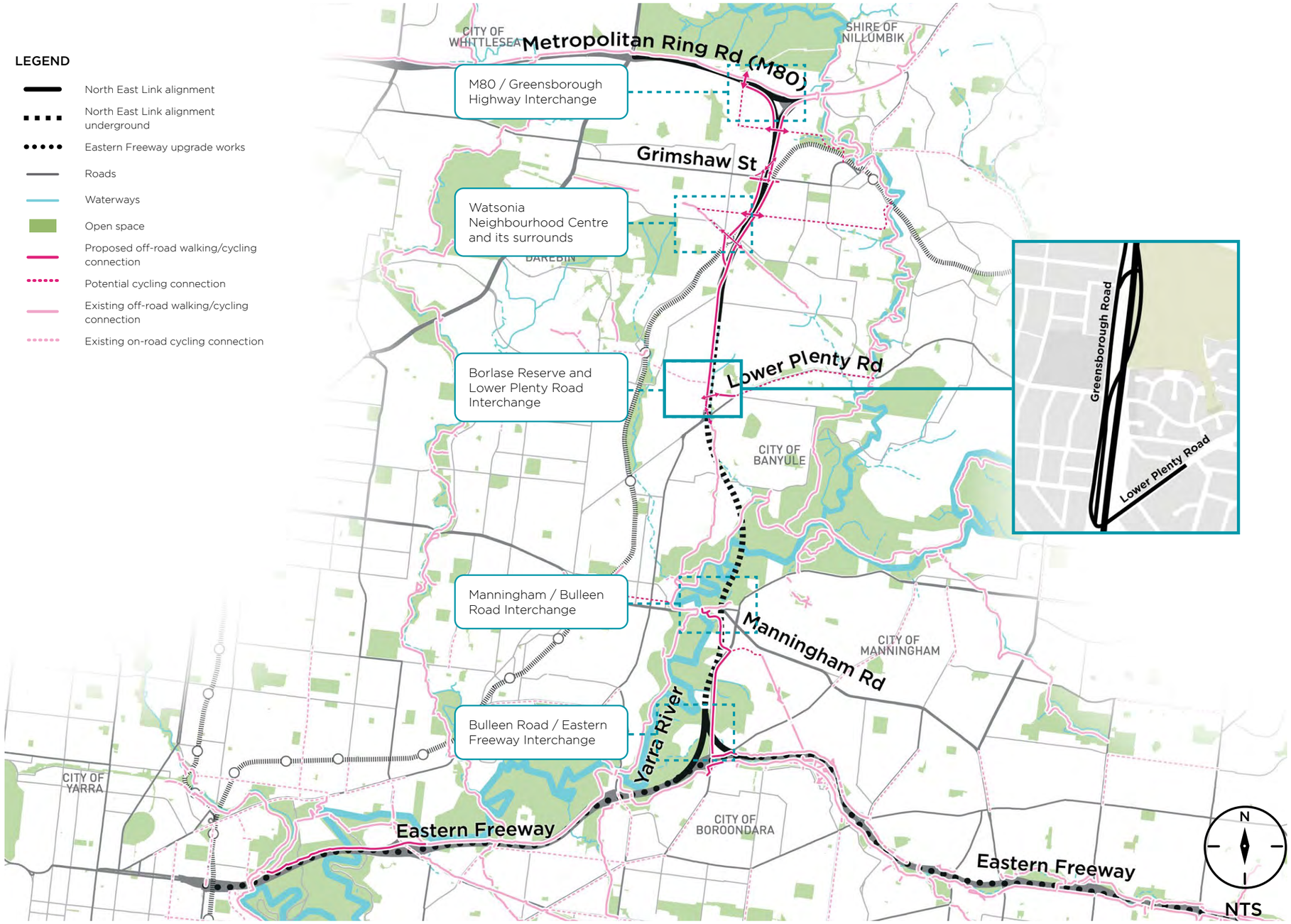
8.3 BORLASE RESERVE AND LOWER PLENTY ROAD INTERCHANGE

Functional summary

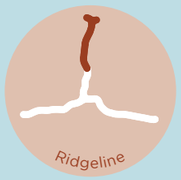
A tunnel interchange north of Lower Plenty Road with a new walking and cycling path across Lower Plenty Road linking Greensborough Road to River Gum Walk.

LOCATION PLAN



BORLASE RESERVE

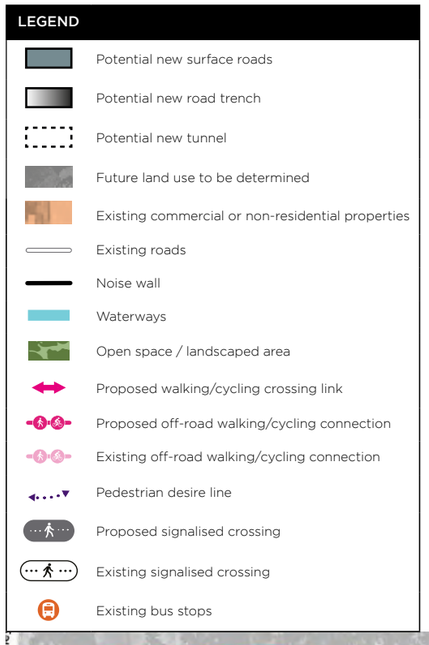
Ridgeline Design Character Area

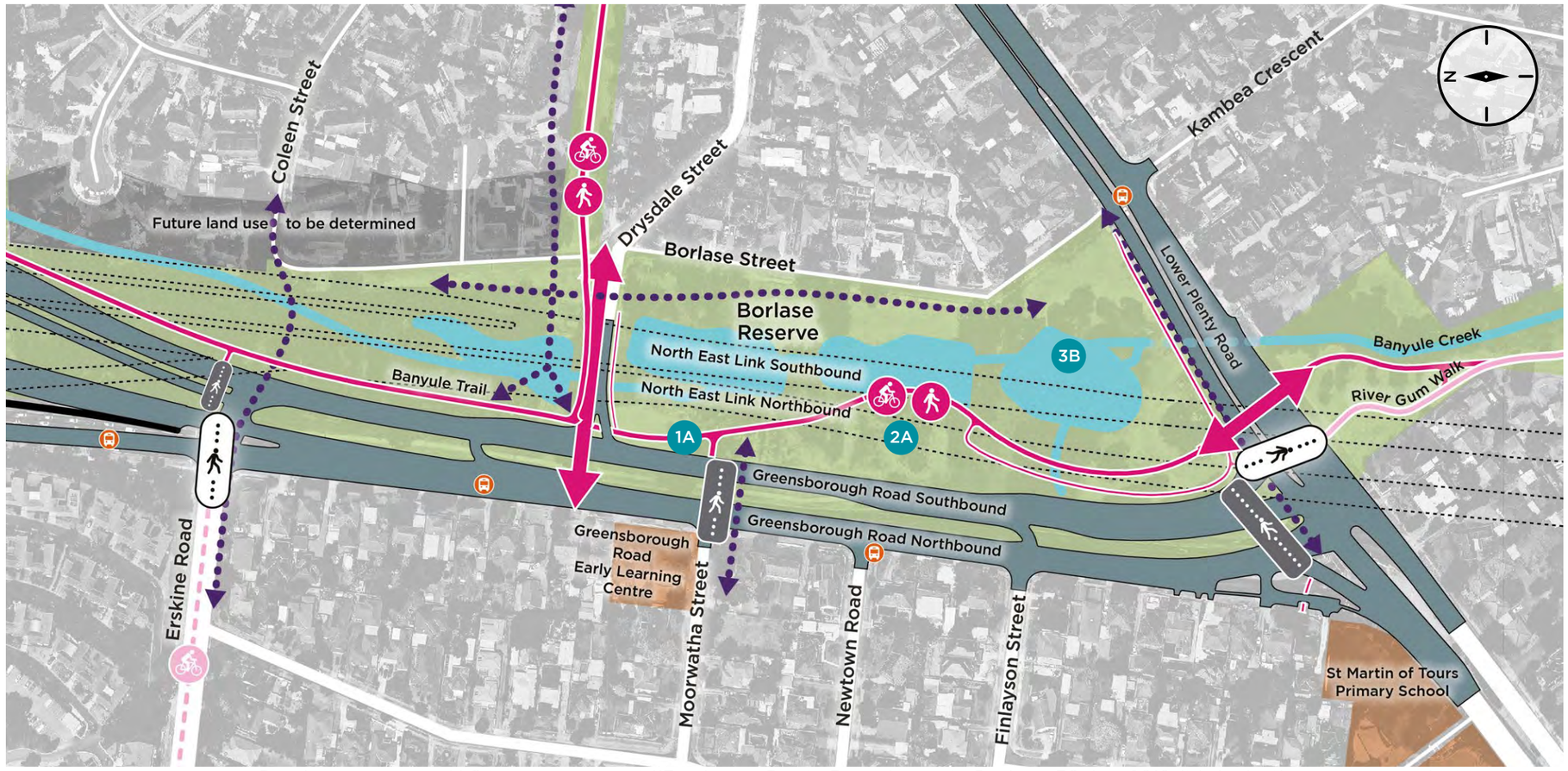


FRAMEWORK PLAN

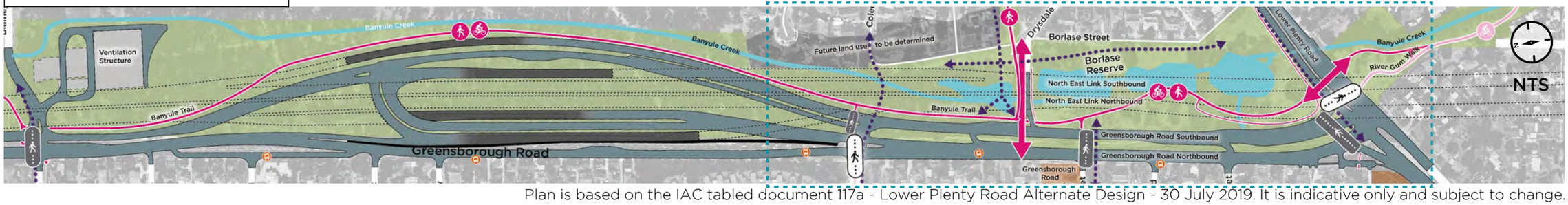
Design intent

Ensure the road footprint is minimised, preserve open space, enhance access and connectivity, and develop opportunities to reinforce the environmental corridor. Minimise impacts to interfacing residential areas for the final design and during the construction phase.





Plan is based on the IAC tabled document 117a - Lower Plenty Road Alternate Design - 30 July 2019. It is indicative only and subject to change. The final project design does not have to reflect this particular layout in order to be in accordance with the UDS.



Plan is based on the IAC tabled document 117a - Lower Plenty Road Alternate Design - 30 July 2019. It is indicative only and subject to change. The final project design does not have to reflect this particular layout in order to be in accordance with the UDS.

BORLASE RESERVE

DESIGN AND DEVELOPMENT PRIORITIES

While all UDS Principles, Objectives and Key Directions apply, the following are most relevant for this location and form the design and development priorities.
These design and development priorities must be addressed within the Urban Design and Landscape Plans.

Key Principles & Objectives

PRINCIPLE 1

IDENTITY

Objective 1.4 Existing landscape character

Provide a high quality design outcome that responds sensitively to the distinctive character of this part of Melbourne, takes advantage of existing landmarks and vegetation, views and significant places, protects landscape and vegetation, and seeks to enhance the way in which people experience and interact with the landscape.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

The existing Borlase Reserve functions as both a passive recreational amenity and a naturalistic, green backdrop for residents. The project provides an opportunity to improve this amenity, creating an experiential landscape and a destination for the broader community.

Objective 1.5 Architectural contribution

Make a positive architectural contribution to infrastructure including bridges, noise walls and other structures.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

Built form around the Simpson Barracks and Borlase Reserve is low rise. Undulating topography provides some distant views across the precinct. The introduction of a relatively tall element such as a ventilation structure would have a visual impact that must be addressed through siting and design.

PRINCIPLE 2

CONNECTING & WAYFINDING

Objective 2.1 Connectivity

Improve people's ability to move through the immediate and wider area with ample, efficient and quality links across and along the corridor for all transport modes, including pedestrians and cyclists.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

Borlase Reserve currently offers a formal pedestrian path at Drysdale Street and an informal pedestrian path from Coleen Street to Greensborough Road. There is a shared use path running north-south, immediately adjacent Greensborough Road. To improve the quality and extent of this limited path network, the project must provide a safe, off-road pedestrian and cyclist link from Yallambie to River Gum Walk, as well as improved east-west connections between Yallambie and Macleod.

PRINCIPLE 3

URBAN INTEGRATION

Objective 3.4 Minimise footprint

Minimise negative impacts on the community and the environment by minimising the design footprint and visual bulk.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

Considering the current role of Borlase Reserve as both visual landscape and functional parkland, there is a unique opportunity to minimise the footprint of the road infrastructure, consolidate land available for parkland and return high-quality parkland to the local community.

PRINCIPLE 4

RESILIENCE & SUSTAINABILITY

Objective 4.3 Environmental sustainability

Optimise environmental performance and embed sustainability initiatives into the design response. This includes integrated water management, biodiversity and habitat enhancement and connections, green infrastructure provision and sustainable use of energy and materials.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

Banyule Creek is predominately a concrete culvert, to north of Lower Plenty Road. Some trees in Borlase Reserve are likely to be removed during the construction of the tunnel. The final design of the project must improve and enhance the function, appearance and biodiversity of the reserve. Amenity within the local area is particularly important to residents, both during and after the construction of the North East Link.

Key Directions

KEY DIRECTION 1

Develop an integrated design response

Excerpt from 3.2 Key design directions

- Redevelop Borlase Reserve and integrate it with the surrounding residential area
- Sensitively integrate tunnel infrastructure elements such as the ventilation structures with the local landscape character.

KEY DIRECTION 3

Recognise cultural and historic values

Excerpt from 3.2 Key design directions

- Consider providing a design response that recognises the cultural heritage of the Simpsons Barracks and the Traditional Owners

KEY DIRECTION 5

Create a context sensitive design

Ridgeline

2.R Connect neighbourhoods, reduce fragmentation and facilitate the continued integration of the diverse community in this area

3.R Reinforce the distinct and unique treed ridgeline character of Melbourne's north-east

4.R Ensure built form associated with the project responds to the urban setting and seeks innovative ways to integrate infrastructure with a djacent land uses.

7.R Provide an architectural and landscape response that integrates seamlessly with the upgraded M80 Ring Road

Excerpt from 3.2 Key design directions

EPRs and Section 7.2 of the UDS require that the project uses design to minimise and mitigate adverse impacts on the community from temporary works and construction activities. This issue is particularly important for the community adjacent to Borlase Reserve.

BORLASE RESERVE

KEY PLACE-SPECIFIC REQUIREMENTS

All place-specific requirements (including those listed below) must be met and addressed within Urban Design and Landscape Plans (refer page 5 section 1.5).
The place-specific context and opportunities provide finer grain detail for these requirements and identify additional opportunities that could be delivered.

1A Upgrade the Banyule Trail (north of Lower Plenty Road) to be a high quality, suitably wide and functional connection that creates a pleasant and attractive journey for users.

4.3 Existing Place-specific requirement - Map R7 - Lower Plenty Road Interchange

Place-specific context and opportunities

The existing shared use path between Greensborough Road and the Simpson Barracks is functional with some canopy cover but is located between a security fence and adjacent traffic.

Improvements to the Banyule Trail must provide pedestrians and cyclists with a safe, off-road path link from Watsonia and Yallambie through Borlase Reserve to River Gum Walk.

The grade-separated walking and cycling crossing at Lower Plenty Road requires careful resolution of competing spatial requirements such as in-ground services, tunnel elevation, at-grade roads and availability of space for ramps and path infrastructure.

2A Provide landscaping to improve appearance and use indigenous planting to support biodiversity and habitat.

Through the design of Water Sensitive Urban Design infrastructure, consider management of stormwater and opportunities to reflect the 'naturalistic' values of Banyule Creek.

4.3 Existing Place-specific requirement - Map R7 - Lower Plenty Road Interchange

Place-specific context and opportunities

Borlase Reserve provides open space and visual amenity to the residents on both sides of Banyule Creek and Greensborough Road. Improvements to the reserve would significantly benefit the local community following project completion.

Given the residential interface with the reserve, there is the opportunity to increase amenity and provide passive recreational open space for nearby residents, as well as connecting walking and cycling links in the area.

Locating the freeway interchange near Blamey Road and minimising the road footprint near Borlase Reserve would increase the opportunity to consolidate parkland and provide a green link north to Yallambie and Watsonia.

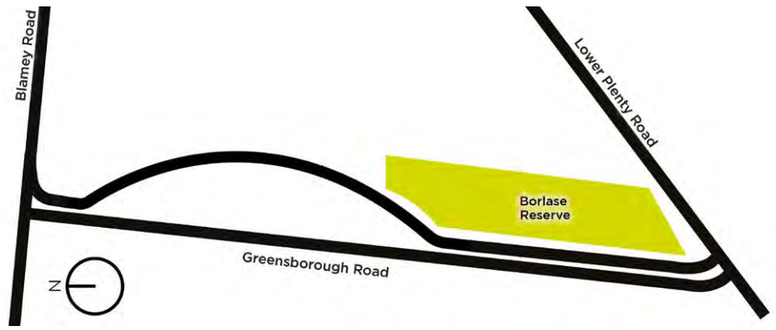


Diagram demonstrates an example road configuration which maximises the retention and functionality of Borlase Reserve

3B Minimise impacts to Banyule Creek from road infrastructure and enhance and extend the natural values of Banyule Creek to improve appearance, biodiversity, habitat and recreational values.

4.3 Existing Place-specific requirement - Map R7 - Lower Plenty Road Interchange

Place-specific context and opportunities

The existing Banyule Creek is located within Borlase Reserve and is an open drainage channel. It would be impacted directly through the construction of North East Link

There is the opportunity to reinstate Banyule Creek as a natural waterway with high amenity for local park users. The surface road footprint must be minimised and road alignment carefully considered, to maximise opportunities to revitalise the creek and maintain waterway stability as a positive asset for the community.

Minimum walking and cycling connection requirements

East-west connections:

- Across Greensborough Road in the form of signalised at-grade crossings near Moorwatha Road
- Across Borlase Street near Drysdale Street in the form of an unsignalised at-grade crossing
- Along Drysdale Street and the utility easement in the form of a new shared use path

North-south connections:

- Along the east side of Greensborough Road from River Gum Walk to Blamey Road in the form of a new shared use path with a grade-separated crossing across Lower Plenty Road
- Across Drysdale Street near Borlase Street in the form of an unsignalised at-grade crossing

North-south and east-west connections:

- Across Greensborough Road in the form of signalised at-grade crossings at the Blamey Road/Fairlie Avenue/ Greensborough Road intersection
- Across Greensborough Road in the form of signalised at-grade crossings near Erskine Road

Refer to Chapter 7 — Detailed requirements & benchmarks

DETAILED REQUIREMENTS

13. Walking & cycling infrastructure
14. Walking & cycling bridges
15. Walking & cycling underpasses

DETAILED REQUIREMENTS

7. Public open space
17. Landscape

DETAILED REQUIREMENTS

18.1 Water sensitive design
18.3 Daylighting waterways
18.6 Maximise community and environmental benefits

BORLASE RESERVE

KEY BENCHMARKS

The key benchmarks below illustrate specific treatments or approaches which demonstrate potential design outcomes relevant to the final design in this location as described in text below.

FIGURE 116 Demonstrates: context sensitive Water Sensitive Urban Design. Trin Warren Tam-Boore Bellbird Waterhole, Parkville. *Image: NELP*

FIGURE 117 Refer Objective 1.5. Demonstrates: contextually sensitive ventilation structure. Burnley Tunnel, Melbourne. *Image: NELP*

FIGURE 118 Refer Objective 1.5. Demonstrates: creative response and landmark feature that celebrates local context. Mullum Mullum Tunnel, EastLink, Melbourne. *Design: Wood Marsh and Tract Consultants, Image: VicRoads*

FIGURE 119 Demonstrates: pedestrian bridge with generous and inviting pedestrian space. Tanderrum Bridge, Melbourne. *Design: John Wardle Architects. Image: NELP*

FIGURE 120 Demonstrates: shade trees and community infrastructure located along path. Koonung Creek Trail, Melbourne. *Image: NELP*

FIGURE 121 Demonstrates: tree planting in a road median to improve appearance and provide cooling. Mason Street, Altona. *Image: GHD*

FIGURE 122 Demonstrates: use of natural light and a generous proportioned underpass. Bowen Place Crossing, Canberra. *Design: Lahz Nimmo Pty Ltd and Spackman Mossop Michaels, Photography: Brett Boardman*

FIGURE 123 Demonstrates: integrated architectural and engineering solution. The design reflects the qualities of its immediate context. Bridge of Remembrance, Hobart. *Design: Denton Corker Marshall, Image: John Gollings*

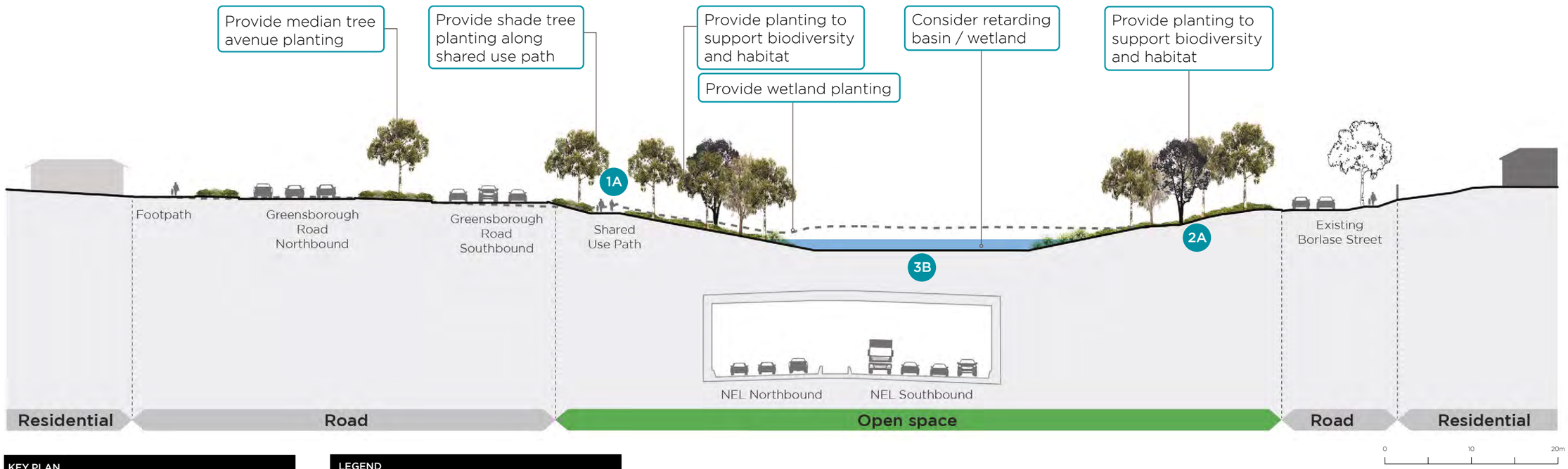
FIGURE 124 Demonstrates: context sensitive Water Sensitive Urban Design. Storage Wetland, Parkville Melbourne. *Image: NELP*

FIGURE 125 Demonstrates: context sensitive Water Sensitive Urban Design. Koonung Creek Wetlands, Melbourne. Image: NELP

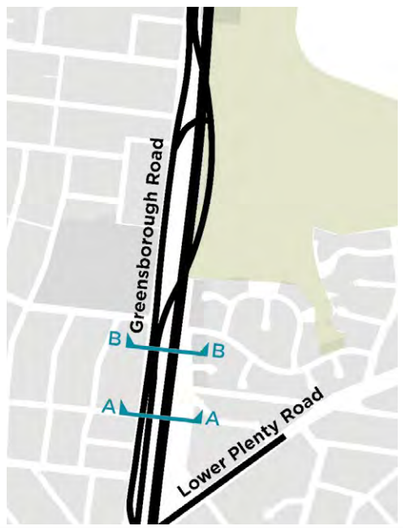
ILLUSTRATIVE SECTIONS

Illustrative sections are indicative only and subject to change. The final project design does not have to reflect this particular layout in order to be in accordance with the UDS.

SECTION AA



KEY PLAN

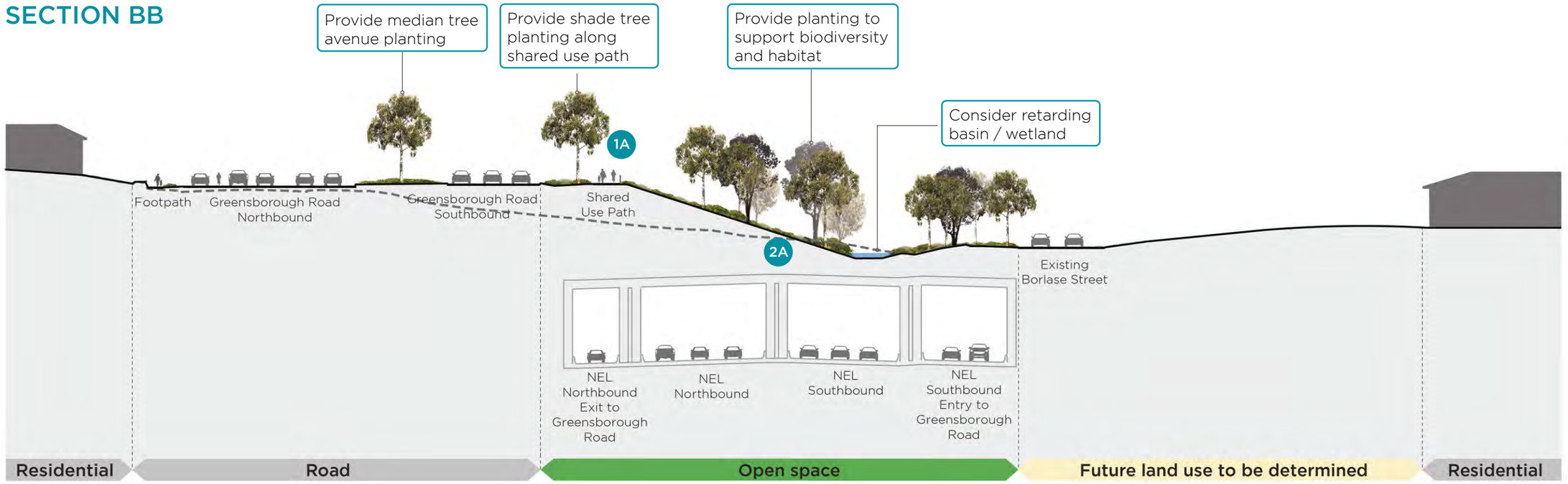


LEGEND

- Proposed surface
- Existing surface
- Requirements
- Proposed vegetation
- Existing vegetation

BORLASE RESERVE

SECTION BB



LEGEND

- Proposed surface
- Existing surface
- Requirements
- Proposed vegetation
- Existing vegetation

BORLASE RESERVE

ACTION PLAN & IMPLEMENTATION STRATEGY

Key components to be developed by the Project

The table below contains the key place-specific requirements identified by stakeholders including the NELP Urban Design Advisory Panel and Councils, and will be delivered by the Project. Whilst these key requirements are considered most relevant to this precinct, the final design must be in accordance with all of the place-specific requirements in the Urban Design Strategy. The broader infrastructure elements for delivery have not been included in this table so as not to limit the final design response and allow for innovation.

	Summary of key place-specific requirements	Type	Key stakeholders	Delivery timeframe
2A	Provide landscaping and use indigenous planting to support biodiversity and habitat.	Landscaping and biodiversity	Banyule, Melbourne Water	During construction (Final stages of construction)
1A	Upgrade to Banyule Trail (north of Lower Plenty Road).	Landscaping and biodiversity	Banyule	During construction
3B	Minimise impacts to Banyule Creek from road infrastructure and enhance and extend the natural values of Banyule Creek.	Infrastructure built measure, Landscaping, WSUD, Open Space	Banyule, Melbourne Water	During construction

Lower Plenty Road Interchange Table 1 - Implementation plan

Opportunities for development or upgrades by others

The table below lists opportunities and proposals for the surrounding precinct that could be developed or upgraded by others. This list includes relevant draft and approved local and state government plans / strategies or key opportunities (by others) identified through the EES process.

Opportunity	Reference
Banyule City Council Water Plan (Draft) 2019 – 2021, Banyule City Council Continue the investigation and implementation of the Capital Works Program at priority locations identified by the Municipal Wide Drainage Network Capacity Study, including: • Stormwater Management Catchment Program Mitigation Works: Improve the capacity of the drainage network around Brixton Avenue, Eltham North and the Lower Plenty drain catchment.	Web Link: https://shaping.banyule.vic.gov.au/rezoning-amendment-c98/draft-water-plan-2019-2021

Lower Plenty Road Interchange Table 2 - Opportunities for implementation by others

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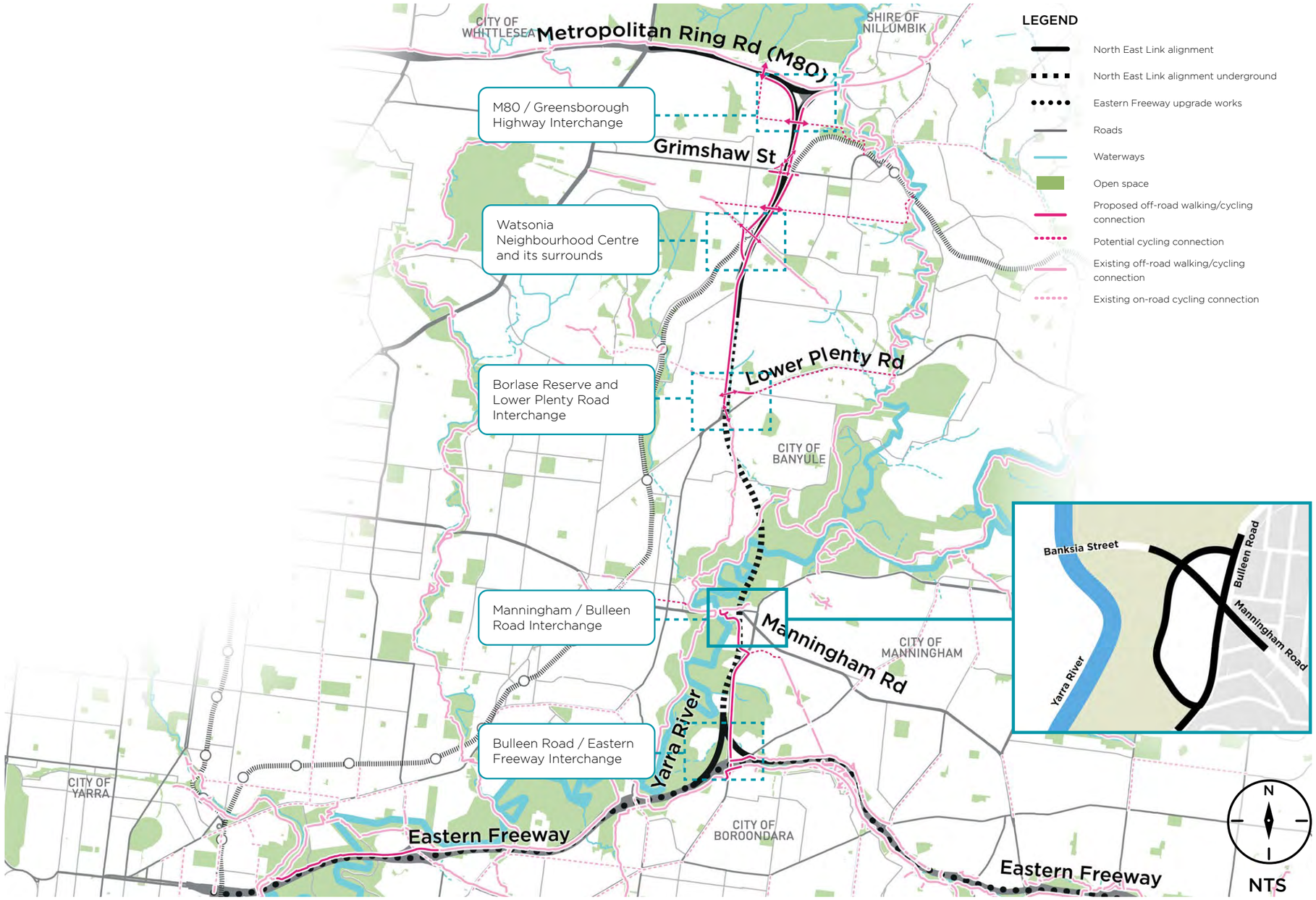
8.4 MANNINGHAM / BULLEEN ROAD INTERCHANGE

Functional summary

A new interchange connecting Manningham Road and Bulleen Road with the North East Link tunnels. While some structures such as the emergency smoke extraction vent would be above ground, the ramps at the interchange would be below ground.

Yarra River Valley Design Character Area

LOCATION PLAN

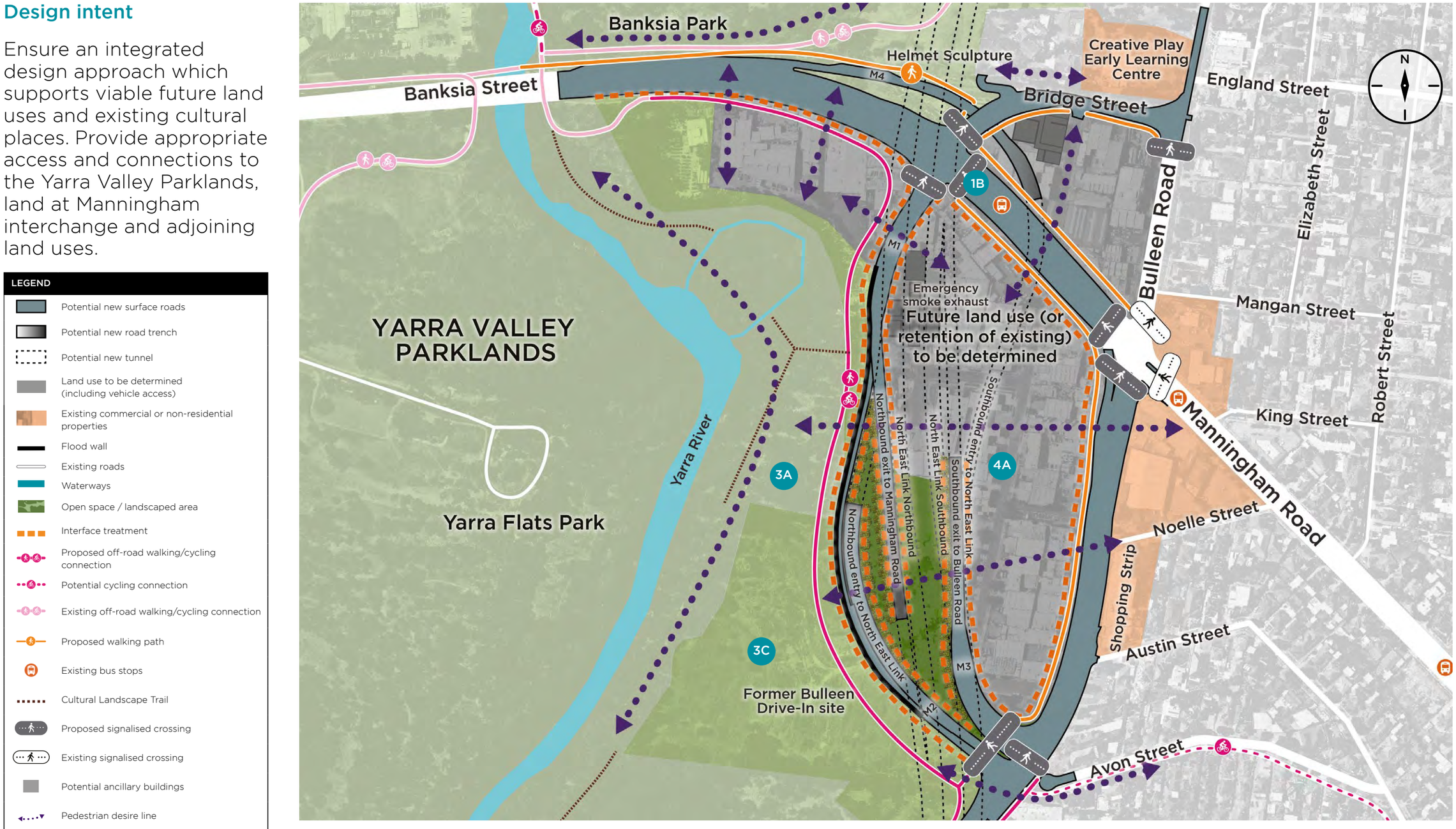


MANNINGHAM

FRAMEWORK PLAN

Design intent

Ensure an integrated design approach which supports viable future land uses and existing cultural places. Provide appropriate access and connections to the Yarra Valley Parklands, land at Manningham interchange and adjoining land uses.



Plan is based on EES Mapbook Sheet 19 - 05 March 2019. It is indicative only and subject to change. The final project design does not have to reflect this particular layout in order to be in accordance with the UDS.

MANNINGHAM

DESIGN AND DEVELOPMENT PRIORITIES

While all UDS Principles, Objectives and Key Directions apply, the following are most relevant for this location and form the design and development priorities.
These design and development priorities must be addressed within the Urban Design and Landscape Plans.

Key Principles & Objectives

PRINCIPLE 1

IDENTITY

Objective 1.1
Sense of place

Protect, maintain and enhance the identity of local places, and respectfully consider Indigenous and non-indigenous cultural values. This includes appropriate consideration of local community facilities, the natural environment, European and Indigenous history, and cultural places such as the Bolin Bolin Billabong, Yarra Bend Park, and Heide Museum of Modern Art.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

Manningham interchange sits in a part of Melbourne that is culturally significant. The Yarra River, Bolin Bolin Billabong and surrounding area hold great significance for the Wurundjeri Woi-wurrung people. The Heide Museum of Modern Art also holds strong connections for many Melburnians. Any design solutions for this area must acknowledge and celebrate these connections. This could reflect the status of the interchange as a primary node and integrate with initiatives such as a gateway gesture.

Objective 1.2
Recognise the Yarra River (Birrarung)

Provide a design that respects and promotes the Yarra River (Birrarung) and its environs which encompass its tributaries, wetlands, billabongs, native vegetation and parklands such as Banyule Flats, and seek opportunities to celebrate this iconic Melbourne asset and ceremonial meeting place for the benefit of Traditional Owners and the general public.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

Parkland between the Yarra River and Bulleen Road, south of Banksia Street and to the north of the Veneto Club is largely inaccessible and underutilised. Pedestrian, cycling and vehicle access to this area is limited. The project provides an opportunity to unlock this area and celebrate the presence of the Yarra River (Birrarung).

PRINCIPLE 2

CONNECTING & WAYFINDING

Objective 2.1 Connectivity

Improve people's ability to move through the immediate and wider area with ample, efficient and quality links across and along the corridor for all transport modes, including pedestrians and cyclists.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

Walking and cycling paths through the parkland east of the Yarra River are informal and sometimes disjointed. The project provides an opportunity to support the extension of the existing walking and cycling network in this area and improve access into the Bolin Bolin precinct. Additional paths near the Manningham interchange would complement path projects delivered by others and contribute to broader connectivity objectives by linking schools and sporting grounds with cultural facilities and residential areas to the east and west of the Yarra River.

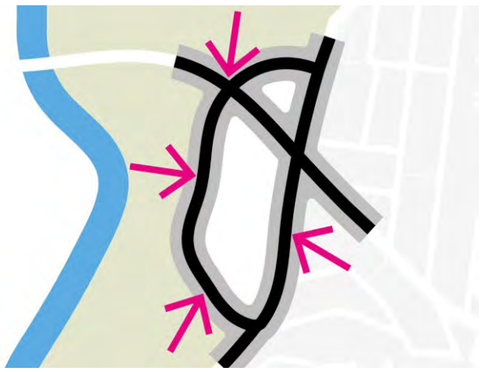


Diagram demonstrating minimisation of footprint. (Illustrating Principle 3.4)

PRINCIPLE 3

URBAN INTEGRATION

Objective 3.3
Strategic alignment

Provide an integrated transport infrastructure and land use solution that responds to strategic transport and land use planning for the broader precinct in consultation with local government and authorities.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

The design and development of the interchange must have regard to relevant approved State and Local Government land use strategies, plans and frameworks including the Yarra Strategic Plan, and Draft Yarra River Bulleen Precinct Land Use Framework Plan (approved as the *Birrarung-Bolin Framework Plan* by the Minister for Planning, February 2024). It is important that the final design supports viable future land uses (such as commercial and industrial uses), provides for suitable future access, and maximises the developable area at surface level to the extent practicable.

Objective 3.4
Minimise footprint

Minimise negative impacts on the community and the environment by minimising the design footprint and visual bulk.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

Manningham interchange presents a significant opportunity to minimise the footprint of the road infrastructure and maximise consolidated land for future development along Bulleen Road and for open space that connects to the Yarra River Parkland. Reducing the horizontal and vertical footprint of the road supports the objective to retain existing businesses (such as Bulleen Art and Garden) and reduce visual impacts on surrounding properties and the adjoining Yarra Valley parklands.

Key Directions

KEY DIRECTION 1
Develop an integrated design response

Excerpt from 3.2 Key design directions

- Optimise the engineering design to sit sensitively in the surrounding environment

KEY DIRECTION 2
Support a natural and connected corridor

Excerpt from 3.2 Key design directions

- Improve local access to the Yarra River and parkland by providing connections through and around the precinct

KEY DIRECTION 3
Recognise past, contemporary & shared Indigenous & historic cultural values

Excerpt from 3.2 Key design directions

- Positively contribute to the cultural identity of the precinct, celebrating the Birrarung, Bolin Bolin Billabong and Heide Museum of Modern Art

KEY DIRECTION 5
Create a context sensitive design

Yarra River Valley

1.Y Protect and promote cultural values for places of significance including the Yarra River, Bolin Bolin Billabong and the Heide Museum of Modern Art
4.Y Maximise opportunities for land use integration at the Manningham Road interchange
5.Y Be sympathetic to the landscape setting of the Greater Yarra Urban Parklands
6.Y Improve the ability for the community to access open space in Bulleen
7.Y Provide enhanced and more convenient cycling routes to Melbourne's inner city areas

Excerpt from 3.2 Key design directions

MANNINGHAM

KEY PLACE-SPECIFIC REQUIREMENTS

All place-specific requirements (including those listed below) must be met and addressed within Urban Design and Landscape Plans (refer page 5 section 1.5).
The place-specific context and opportunities provide finer grain detail for these requirements and identify additional opportunities that could be delivered.

1B All practical design alternatives to retain the existing significant River Red Gum should be explored. If removal cannot be avoided, provide legacy actions in consultation with key stakeholders.

4.3 Existing Place-specific requirement - Map Y1 Manningham Road Interchange

Place-specific context and opportunities

There is considerable community support to retain the existing River Red Gum located near the Caltex site on Manningham Road, which acts a local landmark.

Retention of the existing tree will be challenging due to the significant works associated with constructing the Manningham Interchange in close proximity. Space near the interchange is constrained and therefore it is the difficult to move infrastructure away from the tree without impacting adjacent properties and the Yarra River.

The design should celebrate this local landmark if it can be retained. Its legacy should form part of the design response if removal cannot be avoided.

3A Improve the interface of the Yarra Valley Parklands with the interchange and transport infrastructure. Use landscaping to reveal scenic views and reinforce visual links to the natural environment, and filter views towards infrastructure. Plant indigenous vegetation to support local biodiversity and habitat.

4.3 Existing Place-specific requirement - Map Y1 Manningham Road Interchange

Place-specific context and opportunities

The current interface between the Yarra River parkland and the Manningham interchange site comprises of industrial structures, security fences and parking lots. There is a height differential between the parkland that is lower and prone to flooding, and the current industrial area that sits on higher ground.

Development of the Manningham Interchange must improve the precinct's interface with the Yarra River and integrate with the natural parkland environment. Innovative solutions should be employed to address the flooding issue and provide a positive visual and physical connection between the two areas.

3C Maintain and enhance public access to the Yarra Valley Parklands including water access locations along the Yarra River.

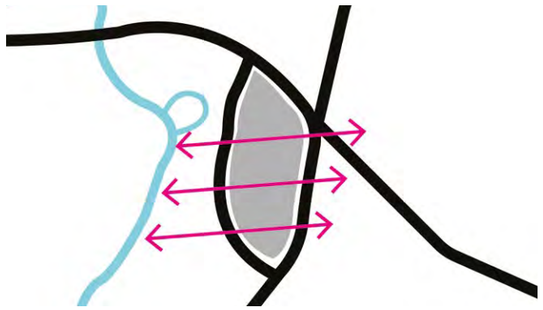
4.3 Existing Place-specific requirement - Map Y1 Manningham Road Interchange

Place-specific context and opportunities

The Bolin Bolin Billabong and associated waterways hold particular significance to the Wurundjeri Woi-wurrung. The Yarra River parkland east of the Yarra River, south of Manningham Road and west of Bulleen Road is difficult to access and not well serviced by walking and cycling facilities.

The project presents the opportunity to enhance this unique part of Melbourne through a considered and respectful design that responds to cultural values, topography, vegetation communities and hydrology.

Wayfinding and the alignment of the path network could enhance connections to the Yarra River, surrounding community and landscape.



Enhance physical and visual connections to the Yarra River

4A Ensure the project design has regard to relevant State and local government strategic land use plans. Enable future land use opportunities by:

- Seeking opportunities to consolidate land parcels and minimise the fragmentation of land parcels
- Designing the road network to accommodate vehicle and pedestrian access to residual land parcels.

New built form must provide sensitive interfaces with the adjoining Yarra Valley Parklands. Built form should be integrated into the landscape to minimise visual impact of flood mitigation and other structures.

4.3 Existing Place-specific requirement - Map Y1 Manningham Road Interchange

Place-specific context and opportunities

Strategic land use plans for the Manningham interchange precinct and adjacent parkland are being developed by State. Whilst they are being prepared, it is important that the design of the North East Link maximises opportunities to accommodate the future plans through initiatives such as maximising the consolidated land available for redevelopment, identifying access to the precinct and establishing a positive connection between the interchange area and the adjacent Yarra River parkland.

Minimum walking and cycling connection requirements

East-west connections:

- Along the northern side of Manningham Road from Bridge Street to Bulleen Road in the form of a pedestrian footpath
- Along the southern side of Manningham Road from Bridge Street to Bulleen Road in the form of a pedestrian footpath
- Along Bridge Street from Manningham Road to Templestowe Road in the form of a pedestrian footpath
- Across Bulleen Road at the Bridge Street intersection in the form of a signalised at-grade crossing

North-south connections:

- Along the west side of Bulleen Road from Manningham Road to Avon Street in the form of a pedestrian footpath
- Along the west side of the Manningham Road interchange from Manningham Road to Avon Street in the form of a shared use path
- Along the east side of Bulleen Road from Avon Street to Thompsons Road in the form of a shared use path

North-south and east-west connections:

- Across Bulleen Road and North East Link entry and exit ramps at Avon Street in the form of at-grade signalised crossings

Refer to Chapter 7 — Detailed requirements & benchmarks

DETAILED REQUIREMENTS

17.4 Landscape - Minimising loss

DETAILED REQUIREMENTS

9.8 Flood walls and retaining walls
17.1 Green corridors

DETAILED REQUIREMENTS

13.1 Pedestrian and cycling network
13.2 Encourage cross-community connectivity
13.3 Pathways and connections
14.4 Path separation

DETAILED REQUIREMENTS

9.8 Flood walls and retaining walls
17.1 Green corridors

MANNINGHAM

KEY BENCHMARKS

The key benchmarks below illustrate specific treatments or approaches which demonstrate potential design outcomes relevant to the final design in this location as described in text below.

FIGURE 126 Refer Objective 3.3. Demonstrates: high quality commercial development with well vegetated frontage which could be enabled. Burwood, Melbourne. *Image: Google*

FIGURE 127 Refer Objective 3.3. Demonstrates: high quality, context sensitive development which could be enabled. MADA building at Monash University, Melbourne. *Design: Nigel Bertram, Image: NELP*

FIGURE 128 Demonstrates: good quality residential development with well vegetated interface which could be enabled. Residential estate, Parkville. Melbourne. *Image: NELP*

FIGURE 129 Refer Objective 1.1. Demonstrates: context sensitive design reflecting cultural values. Brambuk Cultural Centre, Halls Gap VIC. Architect: Gregory Burgess Architects *Photography: Trevor Mein*

FIGURE 130 Demonstrates: dynamic and sculptural screening near tunnel entrance. Vedeggio-Cassarate Tunnel Development, Switzerland. *Design: Cino Zucchi Architetti*

FIGURE 131 Demonstrates: context sensitive architectural solution. *Artist: Anderson Hunt and Down Street Studios. Image: NELP*

FIGURE 132 Demonstrates: buffer planting and mounds filter views from residential areas. Koonung Creek Reserve, Melbourne. *Image: NELP*

FIGURE 133 Demonstrates: shade trees and vegetation located along shared use path. Royal Park, Parkville. *Image: NELP*

FIGURE 134 Demonstrates: a high quality user experience which takes advantage of its setting. Darebin Yarra Trail, Melbourne. *Design: VicRoads, Photography: Emma Cross*

FIGURE 135 Demonstrates: context sensitive Water Sensitive Urban Design. Trin Warren Tam-Boore Bellbird Waterhole Parkville. *Image: NELP*

FIGURE 136 Demonstrates: high quality indigenous planting and sculptural elements within a parkland setting. Royal Park, Parkville. *Image: NELP*

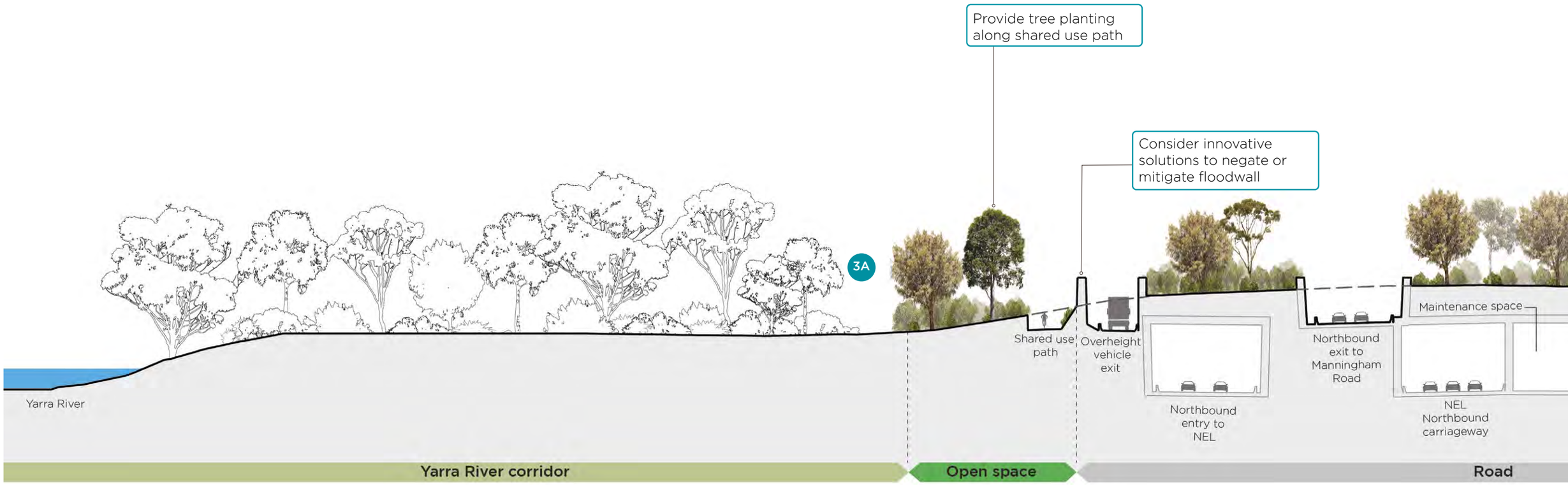
FIGURE 137 Demonstrates: boulevard of trees contributing to streetscape amenity. Mature vegetation on local street, Watsonia. *Image: GHD*

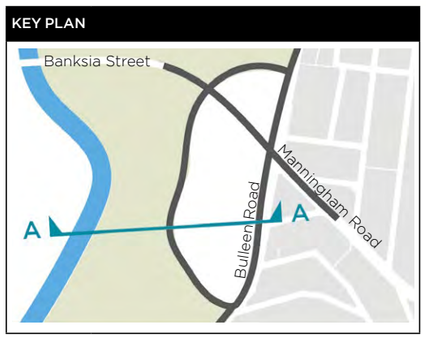
FIGURE 138 Demonstrates: buffer planting used to mitigate views and enhance appearance of walls. Eastern Freeway, Melbourne. *Design: Wood Marsh, Image: NELP*

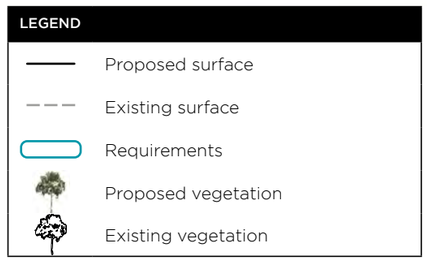
FIGURE 139 Demonstrates: high quality curved and textured wall. Eastern Freeway, Melbourne. *Design: Wood Marsh, Image: NELP*

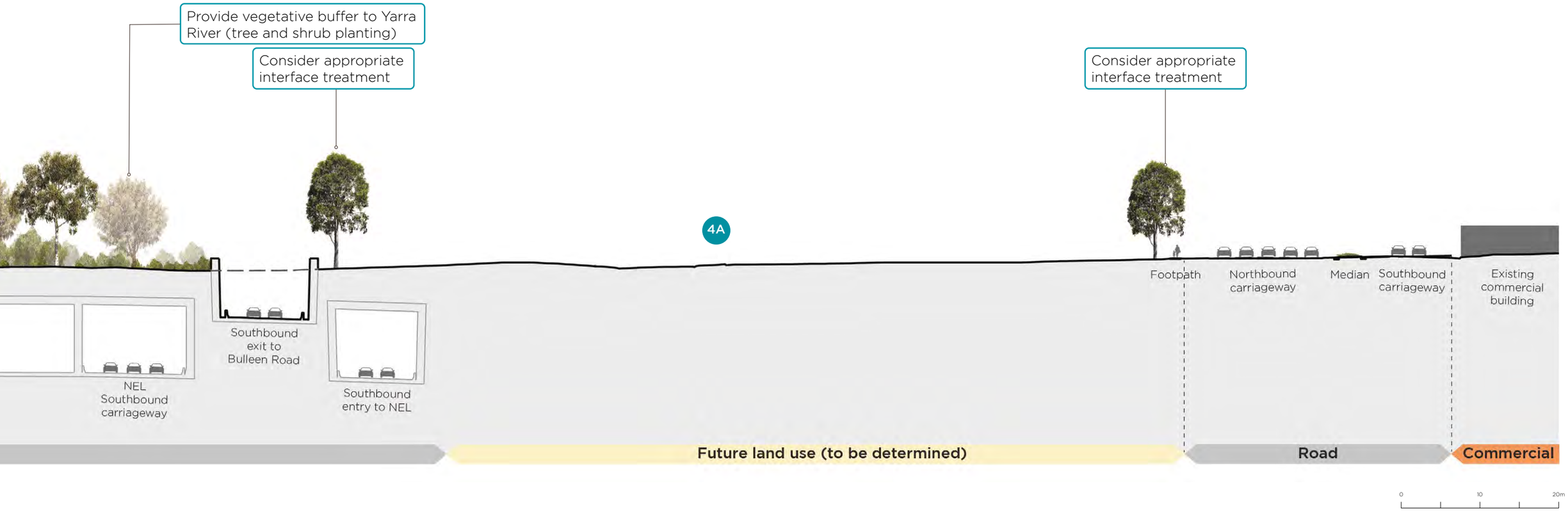
ILLUSTRATIVE SECTIONS

SECTION AA









Road alignment based on EES Mapbook Sheet 19 - 05 March 2019

ACTION PLAN & IMPLEMENTATION STRATEGY

Key components to be developed by the Project

The table below contains the key place-specific requirements identified by stakeholders including the NELP Urban Design Advisory Panel and Councils, and will be delivered by the Project. Whilst these key requirements are considered most relevant to this precinct, the final design must be in accordance with all of the place-specific requirements in the Urban Design Strategy. The broader infrastructure elements for delivery have not been included in this table so as not to limit the final design response and allow for innovation.

	Summary of key place-specific requirements	Type	Key stakeholders	Delivery timeframe
4A	Ensure the project design has regard to relevant approved State and local government strategic land use plans.	Land use	Manningham, Parks Victoria	Prior to construction
3A	Improve the interface of the Yarra Valley Parklands with the interchange and transport infrastructure.	Landscape	Manningham, Parks Victoria	During construction
3C	Maintain and enhance public access to the Yarra Valley Parklands including water access locations along the Yarra River.	Access and amenity	Manningham, Parks Victoria	During construction
1B	All practical design alternatives to retain the existing significant River Red Gum should be explored. If removal cannot be avoided, provide legacy actions in consultation with key stakeholders.	Landscape	Manningham, Wurundjeri Woi-wurrung	Prior to construction

Manningham Road Interchange Table 1 - Implementation plan

Opportunities for development or upgrades by others

The table below lists opportunities and proposals for the surrounding precinct that could be developed or upgraded by others. This list includes relevant draft and approved local and state government plans / strategies or key opportunities (by others) identified through the EES process.

Opportunity	Reference
Draft Yarra River - Bulleen Precinct Land Use Framework Plan, Department of Environment, Land, Water and Planning, 2019 (approved as the *Birrarung-Bolin Framework Plan* by the Minister for Planning, February 2024) The Draft Yarra River - Bulleen Precinct Land Use Framework Plan identifies the following proposed improvements: • Development of a new Cultural Gateway at Bulleen Industrial Precinct, integrating cultural uses with employment uses. • Redevelopment of the former Bulleen Drive-in site for open space or conservation. • Investigate, in partnership with VicRoads (now DTP), the duplication of Templestowe Road, which an analysis of current and projected traffic volumes suggests is warranted. Note: this would include considering provison of shared use paths. The Draft Yarra River - Bulleen Precinct Land Use Framework Plan also notes other important projects near the study area in various stages of development including: • The Bolin Bolin Billabong Rehabilitation Project – Major rehabilitation works at Bolin Bolin Billabong to restore nature water inflow regimes, rehabilitate the surrounding environment, improve habitat for wildlife and improve amenity for people using the area. – Agencies involved in this project include Melbourne Water, Parks Victoria, Manningham Council and the Wurundjeri- Woiwurrung Cultural Heritage Aboriginal Corporation. • The Koonung Creek Linear Park Pathway Connection – Investigation (as part of the Koonung Creek Linear Trail Management Plan) of a pedestrian link to create a circuit at the southern end of the Bolin Bolin Cultural Heritage Trail Site. – Agencies involved include Manningham Council and Boroondara Council.	IAC tabled document 23a EES submission 643, (page 2 & 6)
A new shared use path bridge provided across the Yarra River at Banksia Park, Bulleen to Yarra Street.	IAC 374i (page 4) and EES submission 316 (page 12)
Heide Museum of Modern Art - Protect and improve access to the Heide MOMA.	IAC 374i (page 7), EES submission 643 (page 2 & 5) and EES submission 756 (page 47)
Provide an underpass at Banksia Street, Heidelberg to the east of Dora Street / The Boulevard to create a safer and more direct route on the Main Yarra Trail	IAC 374g (page 234) and EES submission 716 (page 42)
Building car parking to cater for the Birrarung Cultural Precinct, new village and Heide MoMA	EES submission 756 (page 47)

Manningham Road Interchange Table 2 - Opportunities for implementation by others

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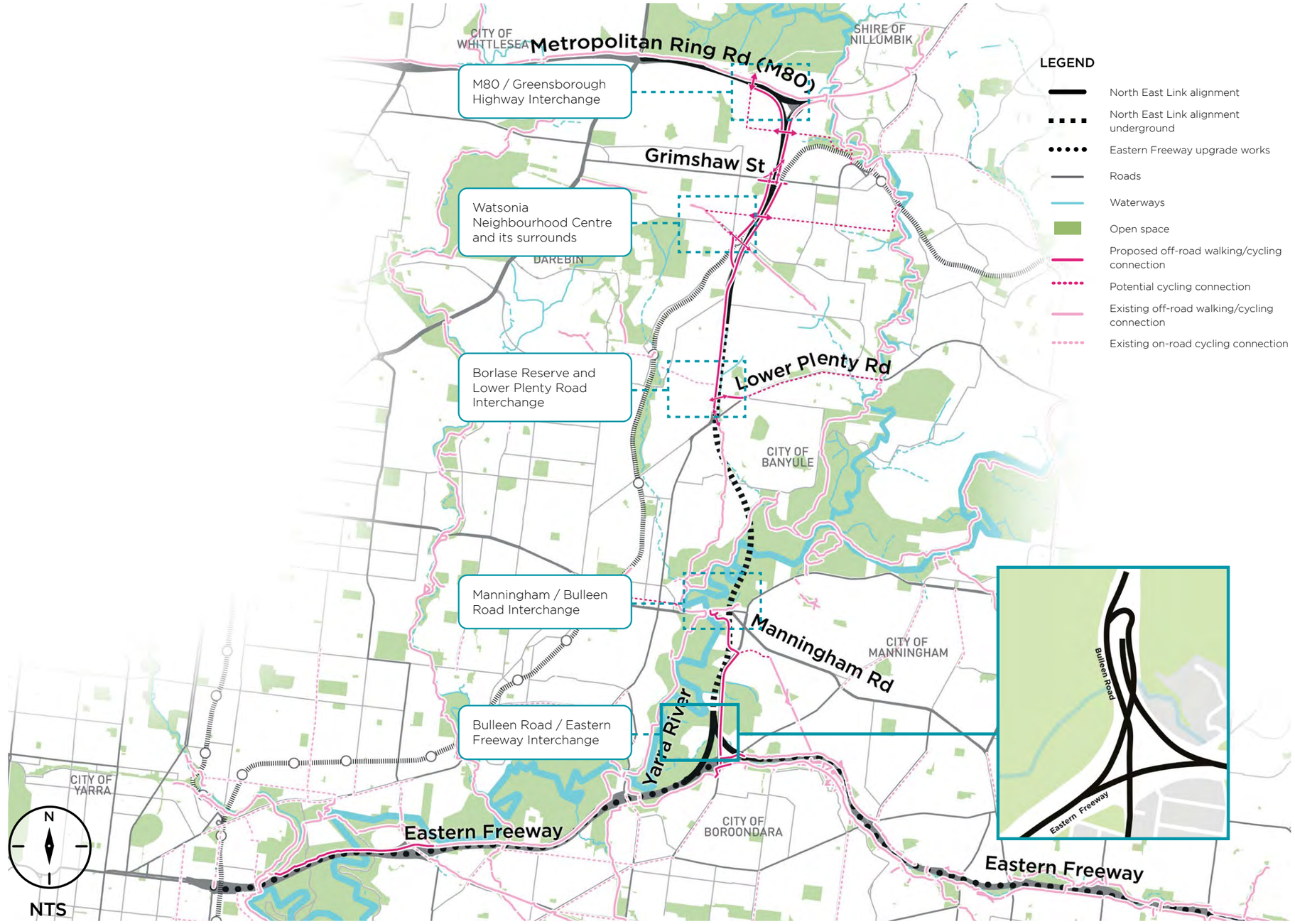
8.5 EASTERN FREEWAY INTERCHANGE

Functional summary

A new interchange and tunnel portal adjacent to Bulleen Road would connect North East Link to the upgraded Eastern Freeway.

LOCATION PLAN



Yarra River Valley Design Character Area

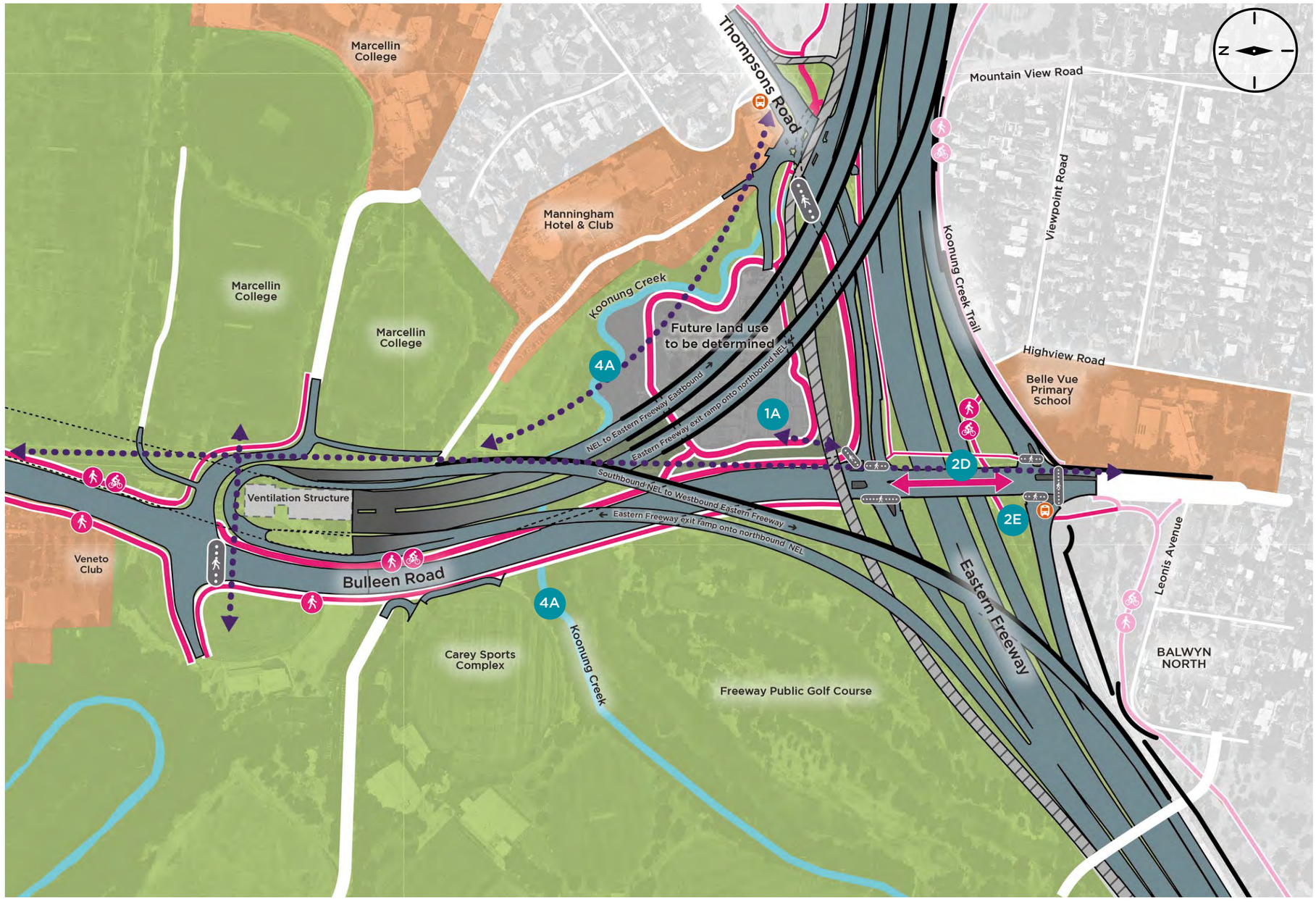
EASTERN FREEWAY

FRAMEWORK PLAN

Design intent

Ensure the road footprint is minimised, improve connectivity and make a positive architectural contribution to the precinct, with appropriate walking and cycling connections and interfaces to schools and residential areas.

Note: There will be subsequent changes to the mix and layout of sport and recreation uses in Bulleen as a result of North East Link, subject to a separate planning approval process.



LEGEND

- Potential new surface roads
- Potential new road trench
- Potential new tunnel
- Future land use to be determined
- Potential new busway
- Existing commercial or non-residential properties
- Existing roads
- Noise wall
- Waterways
- Open space / landscaped area
- Proposed off-road walking/cycling connection
- Existing off-road walking/cycling connection
- Proposed walking/cycling crossing link
- Pedestrian desire line
- Existing bus stops
- Proposed signalised crossing
- Potential ancillary buildings

Plan is based on the IAC tabled document 113 - NELP Bulleen Interchange alternate design - 30 July 2019. It is indicative only and subject to change. The final project design does not have to reflect this particular layout in order to be in accordance with the UDS.

EASTERN FREEWAY

DESIGN AND DEVELOPMENT PRIORITIES

While all UDS Principles, Objectives and Key Directions apply, the following are most relevant for this location and form the design and development priorities.
These design and development priorities must be addressed within the Urban Design and Landscape Plans.

Key Principles & Objectives

PRINCIPLE 1

IDENTITY

Objective 1.3 Landscape & visual amenity

Sensitively enhance landscape and visual outcomes and reduce physical and visual impacts associated with the project.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

The elevated structures, ventilation building, and associated elements could have a visual impact on the residential areas, schools and parkland of the flat landscape along Bulleen Road. The design must address these impacts as a high priority, using innovative solutions, appropriate mitigation measures and sensitive siting to reduce any adverse effects.

Objective 1.4 Existing landscape character

Provide a high quality design outcome that responds sensitively to the distinctive character of this part of Melbourne, takes advantage of existing landmarks and vegetation, views and significant places, protects landscape and vegetation, and seeks to enhance the way in which people experience and interact with the landscape.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

The largely flat topography and residential interfaces around the Eastern Freeway interchange require a landscape-led design approach that reinforces the status of the interchange as a primary node, sensitively integrates new elevated road structures and enhances the significant parkland areas along the Yarra River and Koonung Creek.

PRINCIPLE 2

CONNECTING & WAYFINDING

Objective 2.1 Connectivity

Improve people's ability to move through the immediate and wider area with ample, efficient and quality links across and along the corridor for all transport modes, including pedestrians and cyclists.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

Walking and cycling paths along and across Bulleen Road poorly service the schools (Marcellin College, Trinity Grammar and Carey Grammar) and sporting clubs in the area. The path on the Bulleen Road bridge over the Eastern Freeway is narrow. The Koonung Creek Trail has an at-grade crossing at Bulleen Road. The project must enhance the pedestrian and cycling network and connectivity in the area, improving facilities for students, sports-people, pedestrians and cyclists.

Objective 2.2 Transport integration

Maximise the benefits of the project by facilitating seamless access to a variety of public transport, walking and cycling choices as part of a connected intermodal network.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

A new bus interchange at Bulleen will enhance the public transport options for the area. This facility must be well connected to the pedestrian and cycling network, to maximise access. The Park and Ride must be designed to respond to its context including the Koonung Creek, open space, the adjacent road infrastructure and create a space for use by people (not only vehicles).

PRINCIPLE 3

URBAN INTEGRATION

Objective 3.2 Integration of design

Ensure an integrated engineering, urban design, architectural and landscape architectural approach that sensitively addresses social, cultural, functional and physical aspects of the project.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

The interchange at the junction of the Eastern Freeway and Bulleen Road would be complex, accommodating numerous traffic movements, elevated ramps and a dedicated busway. This increased complexity requires a multi-disciplinary approach that results in well-proportioned elevated structures with clear wayfinding for drivers and a design that integrates well with the Eastern Freeway landscape and adjoining uses.

Objective 3.4 Minimise footprint

Minimise negative impacts on the community and the environment by minimising the design footprint and visual bulk.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

The Eastern Freeway interchange presents a significant opportunity to minimise the footprint of the road infrastructure and protect schools (Marcellin College, Trinity Grammar, Carey Grammar and Belle Vue Primary), sporting clubs and facilities, and businesses (Manningham Hotel).

PRINCIPLE 4

RESILIENCE & SUSTAINABILITY

Objective 4.3 Environmental sustainability

Optimise environmental performance and embed sustainability initiatives into the design response. This includes integrated water management, biodiversity and habitat enhancement and connections, green infrastructure provision and sustainable use of energy and materials.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

Land adjacent and under the new road structures at the interchange presents the opportunity to improve amenity and environmental values through initiatives such as functional water bodies and indigenous planting. This includes connecting and enhancing the Yarra River parkland and Koonung Creek, naturalising waterways and strengthening riparian vegetation.

PRINCIPLE 1

IDENTITY

Objective 1.5 Architectural contribution

Make a positive architectural contribution to infrastructure including bridges, noise walls and other structures.

Excerpt from section 3.1 Urban design principles & objectives

Strategic context and opportunities

The environment along Bulleen Road is flat and open with residences on the escarpment to the north. The introduction of a relatively tall element at Bulleen Park such as a ventilation structure could have a visual impact for residents, parkland users and school students and staff. To address this, the structure must be sensitively sited and well designed.

Key Directions

KEY DIRECTION 1

Develop an integrated design response

Excerpt from 3.2 Key design directions

- Sensitively respond to the functional requirements of the local area including the surrounding schools and natural systems.

KEY DIRECTION 2

Support a natural and connected corridor

Excerpt from 3.2 Key design directions

- Enhance the open spaces and natural systems while improving connectivity along and across the corridor.

KEY DIRECTION 5

Create a context sensitive design

The Eastern Freeway interchange is located within the Yarra River Valley Character Area at the interface with the Koonung Creek Character Area.

Yarra River Valley

1.Y Protect and promote cultural values for places of significance including the Yarra River, Bolin Bolin Billabong and the Heide Museum of Modern Art

4.Y Maximise opportunities for land use integration at the Manningham Road interchange

5.Y Be sympathetic to the landscape setting of the Greater Yarra Urban Parklands

6.Y Improve the ability for the community to access open space in Bulleen

7.Y Provide enhanced and more convenient cycling routes to Melbourne's inner city areas

Excerpt from 3.2 Key design directions

EASTERN FREEWAY

KEY PLACE-SPECIFIC REQUIREMENTS

All place-specific requirements (including those listed below) must be met and addressed within Urban Design and Landscape Plans (refer page 5 section 1.5).
The place-specific context and opportunities provide finer grain detail for these requirements and identify additional opportunities that could be delivered.

1A Design the Eastern Freeway interchange to be a navigational node by using distinctive elements to provide features and landmarks for navigation for all modes of transports. Landscaping is to take inspiration from surrounding natural assets such as the Yarra River and will maximise indigenous planting to support biodiversity and habitat.

4.3 Existing Place-specific requirement - Map Y3 - Eastern Freeway Interchange

Place-specific context and opportunities

The Eastern Freeway interchange would mark the transition between the Eastern Freeway and North East Link. It would also mark a meeting point of waterways (Yarra River and Koonung Creek) and a threshold between the City of Manningham and the City of Boroondara. With these attributes, the design must act as a navigational feature, using a well-considered multi-disciplinary response that sensitively integrates road infrastructure with the surrounding parkland and residential areas.

2D Provide a walking and cycling crossing of the Eastern Freeway linking the new walking and cycling path to the Koonung Creek Trail.

4.3 Existing Place-specific requirement - Map Y3 - Eastern Freeway Interchange

Place-specific context and opportunities

The existing paths on the Bulleen Road bridge over the Eastern Freeway are narrow and are located on the road side of the vehicle containment barriers. This creates an uncomfortable and low-quality experience for pedestrians and cyclists moving between North Balwyn and Bulleen.

The project must enhance the pedestrian and cycling network in the area, by improving the link across the freeway between schools such as Marcellin College and Belle Vue Primary, sporting facilities and residential areas.

2E Provide an alternative grade-separated crossing of Bulleen Road for pedestrians and cyclists traveling along the Koonung Creek Trail.

4.3 Existing Place-specific requirement - Map Y3 - Eastern Freeway Interchange

Place-specific context and opportunities

The existing at-grade crossing at Bulleen Road diminishes the safety, efficiency and enjoyment of the Koonung Creek Trail for pedestrians and cyclists. A grade-separated alternative would enhance the user experience of the trail for both commuter and recreational cyclists, as well as pedestrians.

The design must sensitively integrate the path into the surrounding landscape and carefully consider useability and safety.

4A Provide planting to enhance visual amenity, biodiversity and habitat link along the Koonung Creek corridor

4.3 Existing Place-specific requirement - Map Y3 - Eastern Freeway Interchange

Place-specific context and opportunities

The quality of the Koonung Creek environment is relatively poor, where it passes by the Boroondara Tennis Centre and Manningham Hotel. The creek is in a concrete channel, at the eastern end near Thompsons Road. The area is not very accessible to people other than car park users.

There is an opportunity for the community to re-engage with the Koonung Creek, by improving access and landscaping in the area, addressing hydrology and health of the waterway, maximising opportunities for daylighting and strengthening the habitat link along the creek corridor.

Minimum walking and cycling connection requirements

East-west connections:
- Across Bulleen Road south of the Eastern Freeway in the form of grade-separated crossings
- Across Doncaster Busway south of Thompsons Road in the form of an unsignalised at-grade crossing of Koonung Creek Trail.

North-south connections:
- Across the Eastern Freeway near the Bulleen Road Bridge in the form of a grade-separated crossing
- Along the east side of Bulleen Road from Thompsons Road to Avon Street in the form of a shared use path

East-west and north-south connections:
- Across and along Bulleen Road near Trinity College, Veneto Club, Marcellin College and Carey Grammar in the form of signalised at-grade crossing(s).
- Across and along Bulleen Road south of the Eastern Freeway in the form of signalised at-grade crossings at the Eastern Freeway on/off ramps.
- Across Thompsons Road and Doncaster Busway near Bulleen Park and Ride in the form of signalised at-grade crossings
- Across Bulleen Road and Thompsons Road at the Bulleen Road / Thompsons Road intersection in the form of signalised at-grade crossings

Refer to Chapter 7 — Detailed requirements & benchmarks

DETAILED REQUIREMENTS

7. 1 Integration with surroundings
7.2 Open space infrastructure
13.2 Encourage cross-community connectivity
13.8 Prioritise pedestrians
14.1 Walking and cycling bridge design

DETAILED REQUIREMENTS

13.2 Encourage cross-community connectivity
13.6 Perceived safety

DETAILED REQUIREMENTS

17.5 Enhance habitat and biodiversity
18.2 Healthy waterways
18.3 Daylighting waterways
18.4 Minimise habitat impacts

EASTERN FREEWAY

KEY BENCHMARKS

The key benchmarks below illustrate specific treatments or approaches which demonstrate potential design outcomes relevant to the final design in this location as described in text below.

FIGURE 140 Demonstrates: a landscape design that responds to the high speed viewing environment through the use of terraced planting. CityLink, Melbourne. Design: EDAW, *Image: GHD*

FIGURE 141 Demonstrates: robust and sustainable roadside planting. Eastern Freeway, Melbourne. *Design: VicRoads, Wood Marsh and Tract Consultants, Image: NELP*

FIGURE 142 Demonstrates: a high quality user experience which takes advantage of its setting. Darebin Yarra Trail, Melbourne. *Design: VicRoads, Photography: Emma Cross*

FIGURE 143 Demonstrates: well utilised public open space beneath pedestrian bridge at university campus. Burwood Link Bridge, Melbourne. *Design: Watson Architecture and GHD, Image: GHD*

FIGURE 144 Demonstrates: buffer planting used to mitigate views and enhance appearance of walls. Eastern Freeway, Melbourne. Design: Wood Marsh, *Image: NELP*

FIGURE 145 Refer Objective 3.2. Demonstrates: well considered multi span steel trough bridge with articulated piers and integral crosshead. M80 Ring Road, Melbourne. Design: Peter Elliott and VicRoads, *Photography: John Gollings*

FIGURE 146 Refer Objective 3.2. Demonstrates: Planting that enhances visual amenity and softens built elements. Western Freeway, Warrenheip. *Image: VicRoads*

FIGURE 147 Refer Objective 1.5. Demonstrates: an elegant structural solution that is timeless in design. Eastern Freeway, Melbourne. *Image: GHD*

FIGURE 148 Demonstrates: Inner Northern Busway, Brisbane. *Photography: Christopher Frederick Jones*

FIGURE 149 Refer Objective 1.5. Demonstrates: High quality weather protection design. The Pforzheim Central Bus Station, Pforzheim, Germany. *Design: Metaraum Architects, Photography: Zooey Braun*

FIGURE 150 Refer Objective 3.2. Demonstrates: irrigated greenery that softens visual impact of the road. Domain tunnel entrance, Citylink, Melbourne. *Image: VicRoads*

FIGURE 151 Refer Objective 1.5. Demonstrates: integrated ventilation structure and tunnel approach. Waterview Tunnel, Auckland. Design: Warren and Mahoney, *Image: NZ Transport Agency*

FIGURE 152 Refer Objective 1.5. Demonstrates: creative response and landmark feature that celebrates local context. Mullum Mullum Tunnel, EastLink, Melbourne. *Design: Wood Marsh and Tract Consultants, Image: VicRoads*

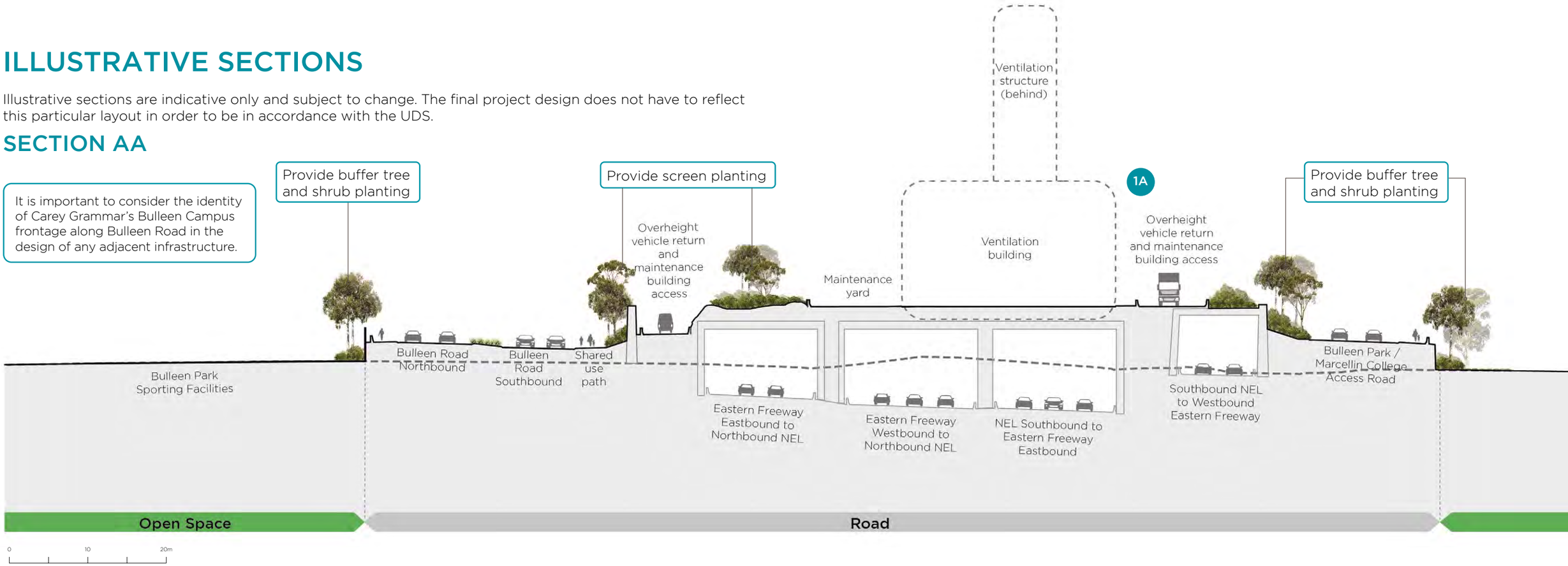
FIGURE 153 Demonstrates: community recreation below structure. Citylink Burnley Bouldering Wall, Melbourne. *Image: VicRoads*

ILLUSTRATIVE SECTIONS

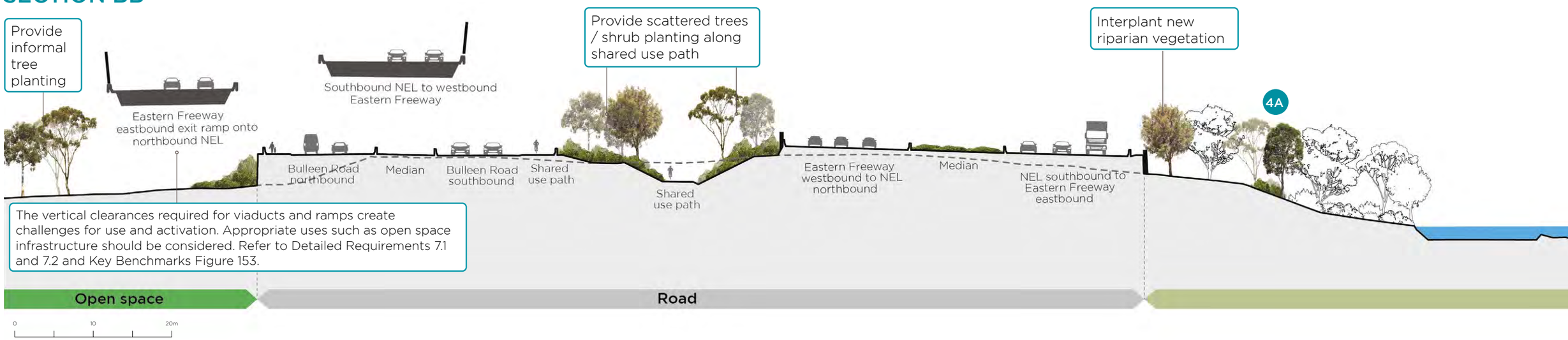
Illustrative sections are indicative only and subject to change. The final project design does not have to reflect this particular layout in order to be in accordance with the UDS.

SECTION AA

It is important to consider the identity of Carey Grammar's Bulleen Campus frontage along Bulleen Road in the design of any adjacent infrastructure.

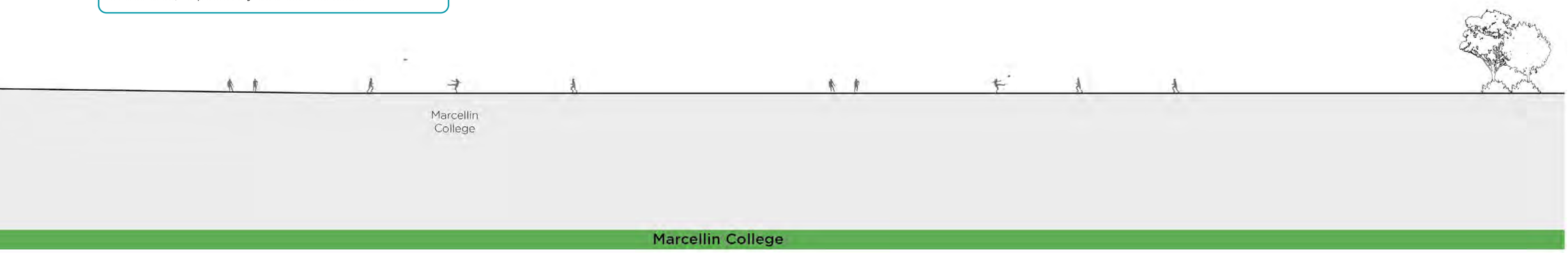


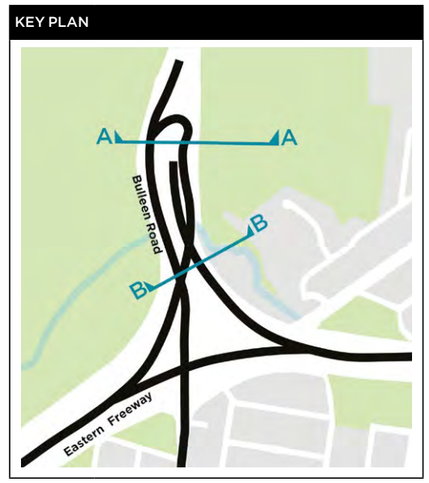
SECTION BB

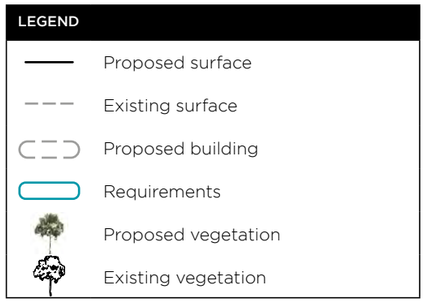


EASTERN FREEWAY

The Bulleen Road frontage of Marcellin College is important for the identity and visibility of the school to the broader community. Careful consideration must be given to the siting and design of any infrastructure in this area, to positively address this issue.





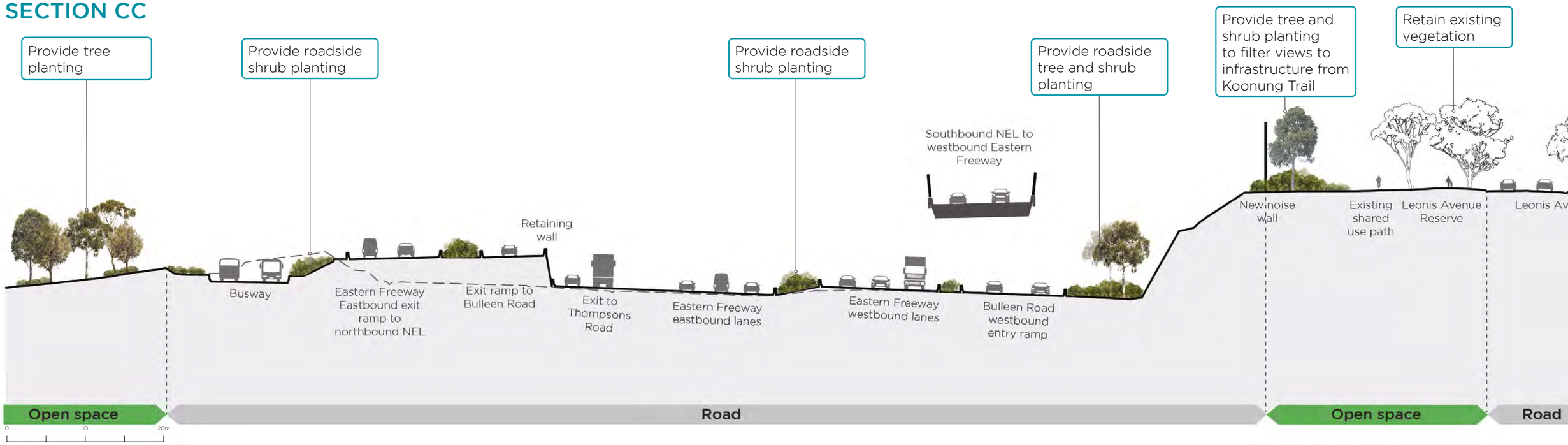


EASTERN FREEWAY

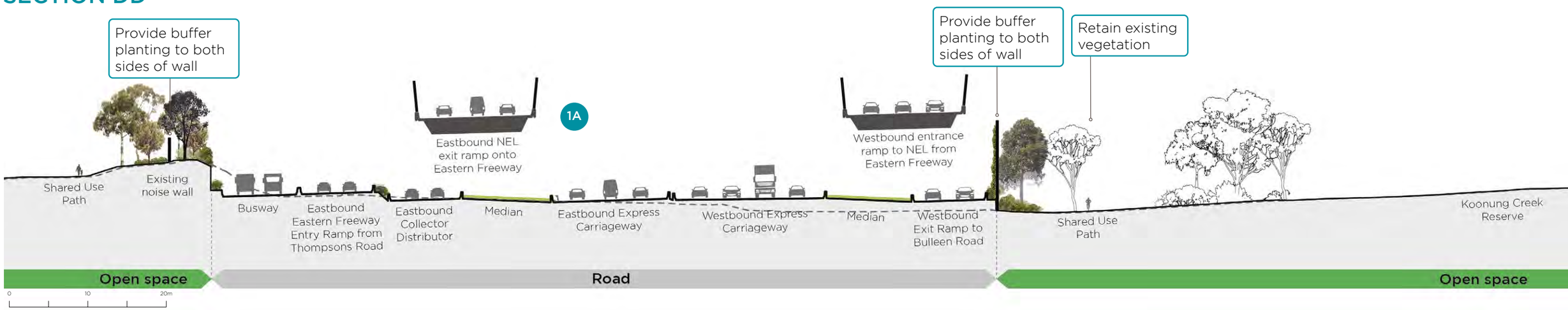
ILLUSTRATIVE SECTIONS

Illustrative sections are indicative only and subject to change. The final project design does not have to reflect this particular layout in order to be in accordance with the UDS.

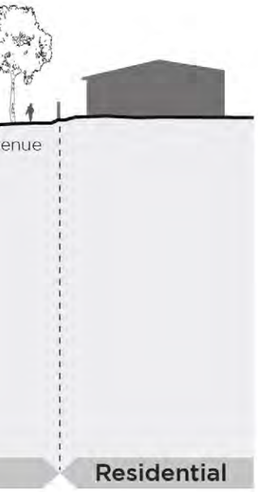
SECTION CC

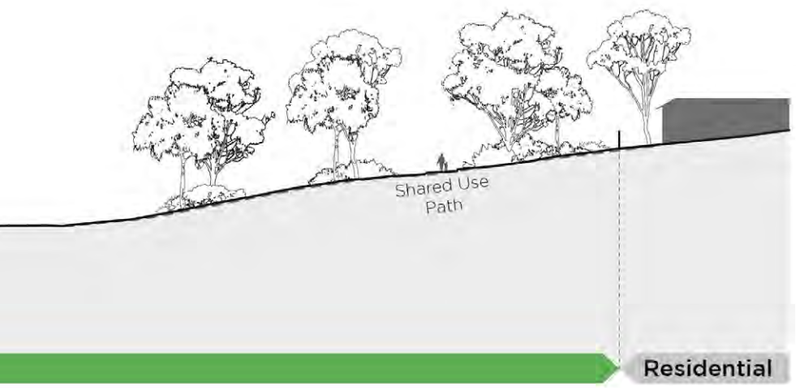


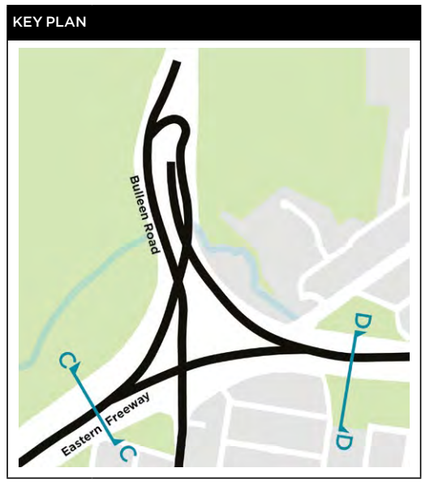
SECTION DD

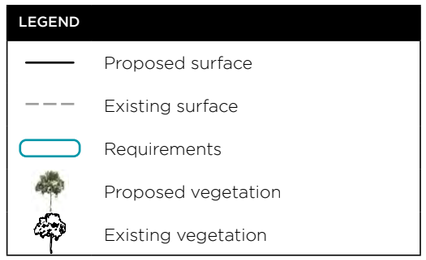


EASTERN FREEWAY









EASTERN FREEWAY

ACTION PLAN & IMPLEMENTATION STRATEGY

Key components to be developed by the Project

The table below contains the key place-specific requirements identified by stakeholders including the NELP Urban Design Advisory Panel and Councils, and will be delivered by the Project. Whilst these key requirements are considered most relevant to this precinct, the final design must be in accordance with all of the place-specific requirements in the Urban Design Strategy. The broader infrastructure elements for delivery have not been included in this table so as not to limit the final design response and allow for innovation.

	Summary of key place-specific requirements	Type	Key stakeholders	Delivery timeframe
2D	A walking and cycling crossing of the Eastern Freeway linking the new walking and cycling path to the Koonung Creek Trail.	Walking and cycling connection	Manningham, Boroondara, DTP	During construction
2E	An alternative grade-separated crossing of Bulleen Road for pedestrians and cyclists traveling along the Koonung Creek Trail.	Walking and cycling connection	Manningham, Boroondara, DTP	During construction
4A	Provide planting to enhance visual amenity, biodiversity and habitat link along the Koonung Creek corridor.	Landscaping and biodiversity	Manningham, Boroondara, Melbourne Water	During construction (Final stages of construction)

Eastern Freeway Interchange Table 1 - Implementation plan

EASTERN FREEWAY

Opportunities for development or upgrades by others

The table below lists opportunities and proposals for the surrounding precinct that could be developed or upgraded by others. This list includes relevant draft and approved local and state government plans / strategies or key opportunities (by others) identified through the EES process.

Opportunity	Reference
Draft Koonung Park Management Plan 2016, Manningham City Council, May 2016 The Draft Plan contains a list of actions for the improvement of Koonung Park. Key actions outlined in the draft management plan include: • Multi use courts including provision for tennis, basketball, netball and futsal soccer • New landscaping and planting throughout the park • Creation of new paths to improve access to community facilities • Improvements to the car park	www.yoursay.manningham.vic.gov.au/koonung-park
Boroondara Open Space Strategy, Boroondara City Council, December 2013 The Boroondara Open Space Strategy identifies upgrades to Columba Street Reserve to improve provision of neighbourhood level unstructured and informal recreational facilities	www.boroondara.vic.gov.au/sites/default/files/2017-05/Boroondara-Open-Space-Strategy.pdf

Eastern Freeway Interchange Table 2 - Opportunities for implementation by others

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Appendix

Metro Tunnel constuction hoardings in Swanston Street, Melbourne

9.1 Alignment with Yarra River Protection (Wilip-gin Birrarung Murron) Act, 2017

In 2017, the Victorian Parliament passed the Yarra River Protection (Wilip-gin Birrarung Murron) Act. This UDS aligns with and supports the relevant principles under the Yarra River Protection (Willip-gin Birrarung Murron) Act 2017 as listed below.

8. General principles Yarra River Protection (Wilip-gin Birrarung Murron) Act, 2017	Outline of, and response to, relevant principles from the Act in this UDS
(1) Proposed development and decision-making should be based on the effective integration of environmental, social and cultural considerations in order to improve public health and wellbeing and environmental benefit.	This UDS requires the integration of environmental, social and cultural considerations when designing North East Link, as referenced in: 1.4 Urban design vision 2.1 Policy and strategic context 3.1 Urban design principles & objectives: Principle 6, Objective 6.1 Putting people first 3.2 Key direction 1: Develop an integrated design response
(2) Decision-makers should take into account the best practicably available information about the potential impacts of climate change so as to avoid, so far as possible, serious or irreversible damage resulting from climate change.	This UDS provides guidance and addresses potential impacts of climate change through the following 3.1 Urban design principles & objectives: Principle 4, Objective 4.2 Resilience and future proofing Principle 4, Objective 4.3 Environmental Sustainability
(3) Decision-makers should take into account the impact of any individual action or policy on public health and wellbeing and seek to ensure that public health and wellbeing is enhanced by the action or policy.	Public health and wellbeing are central to this UDS, including: 3.1 Urban design principles & objectives: Principle 7, Objective 7.1 Safer places Principle 8, Objectives 8.1 Universally inclusive Principle 8, Objective 8.2 Twenty-minute neighbourhoods Principle 8, Objective 8.3 Active transport
(4) Each generation should ensure that the environmental, social and cultural benefits that have been acquired are maintained or enhanced for the benefit of future generations.	This UDS ensures that environmental, social and cultural benefits that have been acquired are maintained and enhanced when designing North East Link, as referenced in: 3.1 Urban design principles & objectives: Principle 1, Objective 1.1 Sense of place Principle 5, Objective 5.1: Improved amenity 3.2 Key direction 3: Recognise past, contemporary & shared Indigenous & historic cultural value
(5) Protection of the environment and delivery of sustainable development is a responsibility shared by all levels of government, industry, business, communities and the people of Victoria.	Protection of environment and sustainability are fundamental in the design of North East Link, including 3.1 Urban design principles & objectives: Principle 4, Objective 4.2 Resilience and future proofing Principle 4, Objective 4.3 Environmental sustainability

9. Environmental principles Yarra River Protection (Wilip-gin Birrarung Murron) Act, 2017	Outline of, and response to, relevant principles from the Act in this UDS
(1) If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation or for failing to assess the risk-weighted consequences of the options.	Addressed in this UDS under the following: 3.1 Urban Design principles & objectives, Principle 3, Objective 3.4 Minimise footprint Principle 4, Objective 4.3 Environmental Sustainability
(2) Environmental practices and procedures should ensure that biodiversity and ecological integrity is maintained or enhanced in ways that are proportionate to the significance of the environmental risks and consequences being addressed.	Enhancements in biodiversity and ecological integrity are supported by this UDS. This is addressed in the following principle: 3.1 Urban Design principles & objectives, Principle 4, Objective 4.3 Environmental Sustainability 3.2 Key design directions, 2: Support a natural and connected corridor
(3) If approaches to managing environmental impacts on one segment of the environment have potential impacts on another segment, the best practicable environmental outcome should be sought.	The UDS does not preclude or contradict this statement.
(4) There should be a net gain for the environment in the area of Yarra River land arising out of any individual action or policy that has an environmental impact on Yarra River land.	This UDS supports design outcomes that enhance the quality of the environment in the area of the Yarra River and strengthen existing green corridors. This is supported by the following: 3.1 Urban Design principles & objectives: Principle 1, Objective 1.2 Recognise the Yarra River (Birrarung) 3.2 Key design directions, 3: Recognise paste, contemporary and shared Indigenous and historical cultural values 7. Detailed requirements and benchmarks, 17. Landscape 17.1 Green corridors
10. Social principles Yarra River Protection (Wilip-gin Birrarung Murron) Act, 2017	**Outline of, and response to, relevant principles from the Act in this UDS**
(1) The existing amenity of Yarra River land, including its natural features, character and appearance, should be protected and enhanced for the benefit of the whole community.	This UDS requires that amenity of Yarra River land and associated features is protected and enhanced when designing North East Link, as referenced in the following: 3.1 Urban Design principles & objectives: Principle 1, Objective 1.2 Recognise the Yarra River (Birrarung) Principle 6. Objective 6.1 Putting people first Principle 6. Objective 6.2 Places for people 3.2 Key design directions, 5: Create a context sensitive design

(2) Community consultation and participation should play an essential and effective role in the protection, improvement and promotion of Yarra River land.	Community and stakeholder consultation resulted in a Design Character Area specifically for the Yarra River Valley. Refer to: 2.2 Consultation & technical inputs 3.2 Key design directions, 5: Create a context sensitive design
11. Recreational principles Yarra River Protection (Wilip-gin Birrarung Murron) Act, 2017	**Outline of, and response to, relevant principles from the Act in this UDS**
(1) Community access to, and use and enjoyment of, Yarra River land should be protected and enhanced through the design and management of public open space for compatible multiple uses that optimise community benefit.	This UDS supports community access to Yarra River environs and promotes enhancement of the open space, as referenced in: 3.1 Urban design principles & objectives: Principle 6 Objective 6.1 Putting people first 3.2 Key direction 2: Support a natural & connected corridor
(2) Public open space should be used for recreational and community purposes that are within the capacity of that space, in order to sustain natural processes and not diminish the potential of that open space to meet the long-term aspirations of the community.	This UDS supports the design of public open spaced that meet the long-term aspirations of the community, as referenced in: 3.1 Urban design principles & objectives: Principle 5 Objective 5.2 Landscape values Principle 6 Objective 6.1 Putting people first 3.2 Key direction 2: Support a natural & connected corridor 7. Detailed requirements & benchmarks, 7 Public open space
12. Cultural principles Yarra River Protection (Wilip-gin Birrarung Murron) Act, 2017	**Outline of, and response to, relevant principles from the Act in this UDS**
(1) Aboriginal cultural values, heritage and knowledge of Yarra River land should be acknowledged, reflected, protected and promoted.	This UDS protects and promotes indigenous history and cultural values. This is addressed in the following: 3.1 Urban design principles & objectives: Principle 1 Objective 1.2 Recognise the Yarra River (Birrarung) 3.2 Key direction 3: Recognise past, contemporary & shared Indigenous & historic cultural value
(2) The role of the traditional owners as custodians of Yarra River land should be acknowledged through partnership, representation and involvement in policy planning and decision-making.	This UDS acknowledges the role of traditional owners as Yarra River land custodians and proposes an approach that recognises, protects and promotes their cultural values, as referenced in: 3.1 Urban design principles & objectives: Principle 1, Objective 1.2 Recognise the Yarra River (Birrarung) 3.2 Key direction 3: Recognise past, contemporary & shared Indigenous & historic cultural value

(3) The cultural diversity and heritage of post-European settlement communities should be recognised and protected as a valued contribution to the identity, amenity and use of Yarra River land.	Post-European settlement historical heritage is supported by the UDS, as referenced in: 3.2 Key direction 3: Recognise past, contemporary & shared Indigenous & historic cultural value
13. Management principles Yarra River Protection (Wilip-gin Birrarung Murron) Act, 2017	**Outline of, and response to, relevant principles from the Act in this UDS**
(1) There should be coordination between all levels of government and government agencies when designing policies and programs and making decisions in relation to Yarra River land.	Key Victorian Government stakeholders consulted in the development of this UDS include the Department of Environment Land Water and Planning (DELWP), Transport for Victoria, VicRoads, Melbourne Water, Parks Victoria and the Office of the Victorian Government Architect (OVGA). Key local government stakeholders consulted included representatives from the municipalities of Banyule, Boroondara, Manningham, Whitehorse, Whittlesea, Yarra and Nillumbik. 2.2 Consultation & technical inputs
(2) When designing policies and programs, the best practicable measures available at the time should be used.	Key Victorian Government stakeholders consulted in the development of this UDS include the Department of Environment Land Water and Planning (DELWP), Transport for Victoria, VicRoads, Melbourne Water, Parks Victoria and the Office of the Victorian Government Architect (OVGA). Key local government stakeholders consulted included representatives from the municipalities of Banyule, Boroondara, Manningham, Whitehorse, Whittlesea, Yarra and Nillumbik. 2.2 Consultation & technical inputs
(3) Implementation of natural resource management should aim for continuous improvement and extend beyond compliance with relevant laws and requirements.	The UDS requires that the design of North East Link is of high quality and beyond compliance in order to superior outcomes, as referenced in: 3.2 Key directions: Key Direction1: Develop an integrated design response

NORTH EASTLINK PROJECT

VICTORIA State Government