



Image of shared user path in parkland, Homebush, Sydney



# B.0 PEDESTRIAN AND CYCLE IMPLEMENTATION PLAN

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## B.1 Definitions and terms

The table below provide the list of abbreviations and definitions used throughout this plan

Table B-1:Glossary of terms and definitions

| Abbreviation     | Description   |
|------------------|---|
| Active Transport | Active transport encompasses non-motorised forms of transport that require physical activity, such as walking or cycling, and can be for recreational or commuter purposes. |
| Arncliffe Park   | Referred to as "Marsh Street Park", at the request of Bayside Council   |
| ATC              | Active Transport Corridor – a facility that enables convenient and safe active transport trips.   |
| Council          | Bayside Council   |
| CDT              | TfNSW Cycleway Design Toolbox, designing for cycling and micromobility, Dec 2020 (ver 0.1)  |
| CPTED            | Crime Prevention Through Environmental Design   |
| CSSI             | Critical State Significant Infrastructure   |
| D&C              | Design and construct  |
| D&C Contractor   | CPB Contractors, Ghella & UGL Engineering joint venture   |
| EIS              | Environmental Impact Statement  |
| FRP              | Fibreglass Reinforced Polymer   |
| MCoA             | Minister's Condition of Approval  |
| midblock         | Location along road that is some distance from an intersection  |
| MOC              | Motorway Operations Complex   |
| NSW              | New South Wales   |
| PCIP             | Pedestrian and Cycle Implementation Plan  |
| PIR              | Preferred Infrastructure Report   |
| Project          | M6 Motorway - Stage 1   |
| 'rat running'    | Practice by motorists of using minor residential streets during peak periods to avoid congestion on main roads  |
| RSA              | Road Safety Audit   |
| RTA              | NSW Roads & Traffic Authority (now TfNSW)   |
| SCCN             | Strategic Cycleway Corridors Network  |

| Abbreviation    | Description   |
|-----------------|---|
| Separated Path  | Bi-directional cycle and pedestrian paths, separated by a vegetated median or line markings                                     |
| Shared Path     | Bi-directional path, where the space is shared by cyclists and pedestrians  |
| SID             | Safety in Design  |
| State           | State of New South Wales  |
| TfNSW           | Transport for New South Wales   |
| Traffic calming | A deliberate slowing of traffic in residential areas, by installation of speed humps or other impediments to high-speed traffic |
| UDLP            | Urban Design and Landscape Plan   |
| WHS             | Work Health and Safety  |

## B.2 Introduction

### B.2.1 Purpose of this plan

The M6 Motorway – Stage 1 project (Project) is classified as Critical State Significant Infrastructure and was approved in December 2019 (ref SSI 8931). This Pedestrian and Cycle Implementation Plan (PCIP) has been prepared to comply with NSW's Minister for Planning, Condition of Approval (MCoA) E153.

Other related MCoA include E109, E140, E144, E150, E151, and E152.

#### MCoA E153

MCoA E153 is presented in *Table B-2*, including cross references to the section(s) within this PCIP that address each specific requirement.

The Pedestrian and Cycle Implementation Plan outlines the existing pedestrian and cycle facilities within the vicinity of the Project, and describes the new connections provided as part of the Project to the existing local and regional network.

Table B-2: MCoA E153 Compliance Matrix

| CONDITION REFERENCE | CONDITION   | REFERENCE                                  |
|---------------------|---|--|
| E153                | A detailed Pedestrian and Cycle Implementation Plan must be included as a component of the Urban Design and Landscape Plan required by Condition E154. The Plan must be prepared in consultation with relevant council(s) and Bicycle NSW. The Plan must include: | Refer <i>Section B.2.3</i>                 |
|                     | (a) pedestrian and cycle engineering and safety standards;  | Refer <i>Section B.6</i>                   |
|                     | (b) a safety audit of existing and proposed pedestrian and cycle facilities to address the above standards;   | Refer <i>Section B.7.3</i>                 |
|                     | (c) details of selected routes and connections to existing local and regional routes, including the findings of Conditions E150, E151 and E152;   | Refer <i>Sections B.5 &amp; B.5.1</i>      |
|                     | (d) timing and staging of all works;  | Refer <i>Sections B.2.2 &amp; B.11</i>     |
|                     | (e) infrastructure details, including lighting, safety, security, and standards compliance;   | Refer <i>Sections B.6.2, B.7 &amp; B.8</i> |
|                     | (f) signage and wayfinding measures; and  | Refer <i>Section B.9</i>                   |
|                     | (g) details of associated landscaping works.  | Refer <i>Section B.10</i>                  |
|                     | All identified works arising from this condition are to be implemented prior to the commencement of operation, except as permitted by this approval.  | Refer <i>Section B.2.2</i>                 |

## Other related MCoA

MCoA E109, E140, E144, E150, E151, and E152 are presented in *Table B-3* including cross references to the section(s) within this PCIP that address each specific requirement.

Table B-3: Other MCoAs relevant to this plan

| CONDITION REFERENCE | CONDITION  | REFERENCE                  |
|---------------------|--|----------------------------|
| E109                | Construction must be staged to maximise progressive public access and use of the reinstated Rockdale Bicentennial Park and other public spaces   | Refer Section B.11         |
| E140                | The Proponent must construct and operate the CSSI with the objective of minimising light spillage to surrounding properties. All lighting associated with construction and operation must be consistent with the requirements of Australian Standard 4282-1997 Control of the obtrusive effects of outdoor lighting and relevant Australian Standards in the series AS/NZ 1158 – Lighting for Roads and Public Spaces, as relevant. Additionally, the Proponent must provide mitigation measures to manage any residual night lighting impacts from operational motorway complexes and the shared pedestrian and cycling pathway to protect properties adjoining or adjacent to the CSSI, in consultation with affected landowners   | Refer Section B.6.1        |
| E144                | The CSSI must incorporate appropriate community safety, amenity and privacy measures, including 'safer by design' principles where relevant  | Refer Section B.7          |
| E150                | The Proponent must review the feasibility of constructing an at-grade footpath along the northern side of President Avenue between West Botany Street to the west and O'Neill Street to the east to provide a continuous east-west connection along the northern side of President Avenue. If the review indicates that it is feasible to install the footpath, then the footpath must be constructed as part of the CSSI and be completed prior to operation. Should the assessment conclude that it is not feasible to construct the footpath, then the Proponent must provide a copy of the review and a written statement to the Planning Secretary justifying why the path will not be constructed. The assessment and statement must be submitted to the Planning Secretary for information within 12 months of commencing construction. | Refer Sections B.5 & B.5.1 |
| E151                | The proposed on-road portion of the active transport corridor between Bruce Street and England Street at Brighton-Le-Sands, as described in the EIS, must be realigned:  | Refer Sections B.5 & B.5.1 |
|                     | a. to follow the existing F6 reserved corridor;  | Refer Sections B.5 & B.5.1 |
|                     | b. utilise TfNSW(RMS)-owned properties where possible;   | Refer Sections B.5 & B.5.1 |
|                     | c. in a manner that maximises the safe movement of pedestrians and cyclists, and maximises the separation of the cycleway from the existing road network; and  | Refer Sections B.5 & B.5.1 |
|                     | d. to provide a contiguous shared pathway for pedestrians and cyclists between Greg Arkins Mini Field and Rockdale Bicentennial Park via Tony Baker Reserve.   | Refer Sections B.5 & B.5.1 |
| E152                | The Proponent must investigate the feasibility of an alternative alignment of the shared path over President Avenue and through Patmore Swamp to minimise impacts on the biodiversity values of Patmore Swamp. In particular, the assessment should investigate realigning the shared path to the eastern boundary of Scarborough Park North and relocating the southern landing of the shared path over President Avenue away from the wetlands.  | Refer Section B.5.1        |

### B.2.2 Implementation process

The process of implementation of pedestrian and cycle infrastructure commenced at the inception of the Project, considering regional and local network planning and stakeholder representations. The Project is currently in the execution phase (detailed design and construction).

The Project implementation process and key PCIP events are illustrated in *Figure B-1*.

All works identified in this Plan shall be implemented prior to the commencement of operation.

### B.2.3 Consultation

The Project is within the Bayside Council local government area. TfNSW will operate and maintain some infrastructure described in this PCIP, but the majority will be novated to Bayside Council on completion of construction.

Consultation with key stakeholders is summarised in *Table B-4*. Further details of stakeholder consultation during the Execution phase are provided in the M6 Stage 1 Consultation Report required under MCoA A5.

Feedback received through the consultation process has been considered and responded to as part of the finalisation of this Plan and prior to submission to the Department of Planning and Environment.

Table B-4: Key Stakeholders Consultation Summary

| Stakeholder   | When  | Summary   |
|---|---|---|
| TfNSW Active Transport Unit   | <ul style="list-style-type: none"> <li>Throughout Execution phase (detailed design)</li> </ul>  | <ul style="list-style-type: none"> <li>Regional network planning and connections</li> <li>ATC demand and capacity (path widths)</li> <li>ATC road crossings</li> <li>Detailed design reviews</li> <li>SiD and CPTED review workshops</li> </ul>   |
| Bayside Council (future infrastructure owner, operator, maintainer) | <ul style="list-style-type: none"> <li>Planning phase</li> <li>Procurement phase</li> <li>Throughout Execution phase (detailed design)</li> </ul>   | <ul style="list-style-type: none"> <li>Local network planning and connections</li> <li>ATC Whiteoak Reserve and CA Redmond Field functional layout</li> <li>Rockdale Bicentennial Park functional layout</li> <li>Marsh Street Park functional layout</li> <li>Detailed design reviews</li> <li>SiD and CPTED review workshops</li> </ul>   |
| Sydney Water  | <ul style="list-style-type: none"> <li>Planning phase</li> <li>Procurement phase</li> <li>Throughout Execution phase (detailed design)</li> </ul>   | <ul style="list-style-type: none"> <li>ATC interface with Muddy Creek Naturalisation project at Whiteoak Reserve – projects are interwoven to maximise public amenity</li> </ul>  |
| Bicycle NSW   | <ul style="list-style-type: none"> <li>Planning phase</li> <li>Execution phase (detailed design)</li> <li>Execution phase (construction)</li> </ul> | <ul style="list-style-type: none"> <li>Representations dated:                             <ul style="list-style-type: none"> <li>3 Aug 2018</li> <li>13 Dec 2018</li> <li>29 May 2019</li> </ul> </li> <li>Briefing meeting (online) on 28 Sep 2022, attend by:                             <ul style="list-style-type: none"> <li>Bicycle NSW</li> <li>TfNSW</li> <li>D&amp;C Contractor</li> </ul> </li> <li>Site meeting at Bestic St and Barton Park, Banksia on 26 Oct 2022, attended by:                             <ul style="list-style-type: none"> <li>Bicycle NSW</li> <li>Bayside Council</li> <li>TfNSW</li> </ul> </li> <li>Draft PCIP review in January 2023</li> <li>Representation on construction Traffic &amp; Transport Liaison Group</li> </ul> |
| BIKEast   | <ul style="list-style-type: none"> <li>Planning phase</li> </ul>  | Representation dated 14 Dec 2018  |
| Local sport clubs / associations                                    | <ul style="list-style-type: none"> <li>Execution phase (detailed design)</li> </ul>   | <ul style="list-style-type: none"> <li>Rockdale Rugby Club to mitigate impacts to rugby fields</li> <li>St George Netball Association to mitigate impacts to netball courts south of Muddy Creek</li> </ul>   |
| Local community, residents  | <ul style="list-style-type: none"> <li>Execution phase (detailed design and construction)</li> </ul>  | <ul style="list-style-type: none"> <li>Immediate neighbours, residents along the alignment</li> </ul>   |

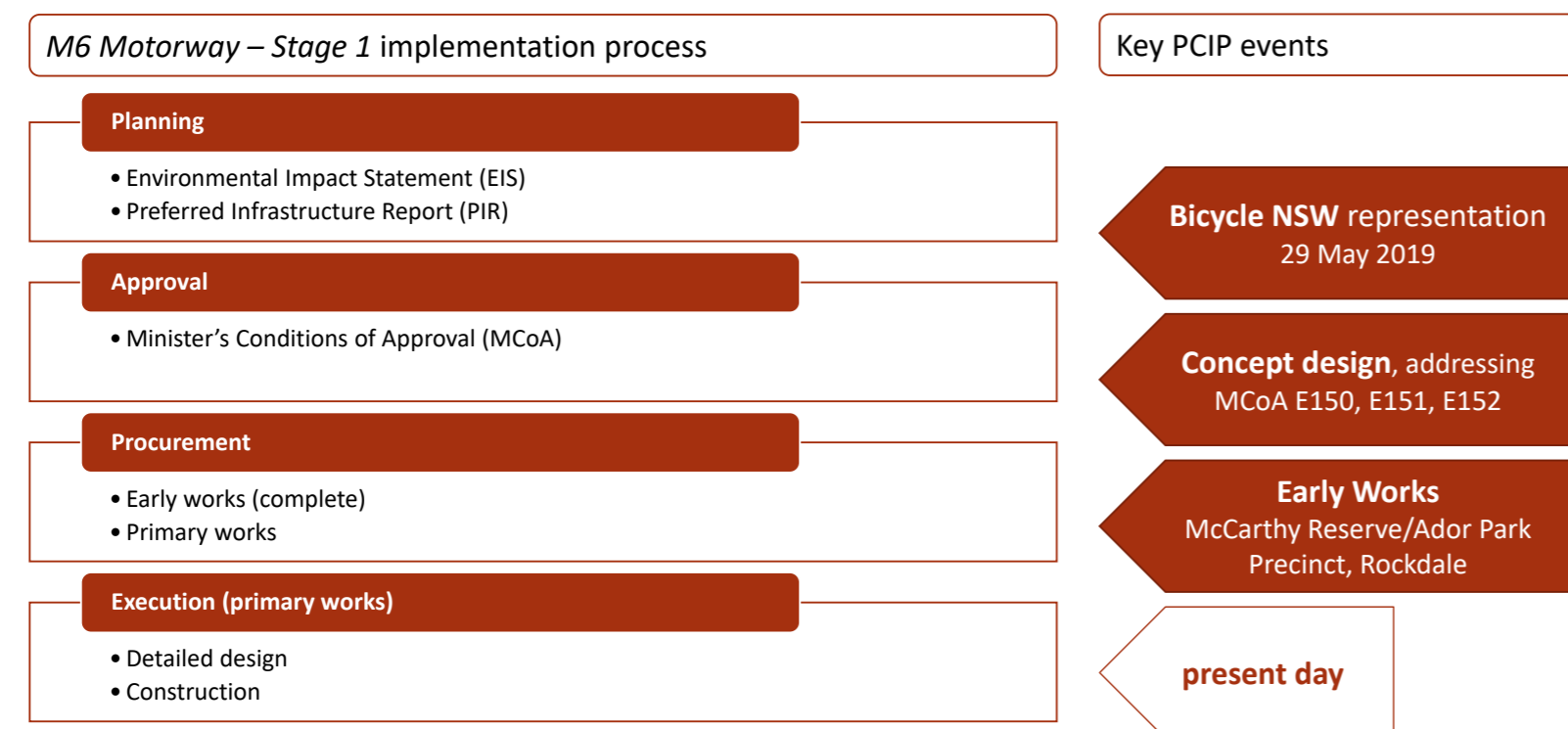


Figure B-1: Project Implementation Process

### B.3 M6 Motorway - Stage 1 Scope

The Project will deliver the missing link from Sydney's south to the wider Sydney motorway network making journeys easier, faster and safer. It will remove more than 2,000 trucks a day from surface roads and help return local streets to local communities.

Future Transport Strategy 2056 is the NSW Government's 40-year vision for transport outcomes in NSW. The Project is a key part of this strategy, supporting safe, efficient and reliable journeys for people and freight.

The Project includes:

- Twin four-kilometre tunnels linking the M8 Motorway at Arncliffe to President Avenue at Kogarah
- Ramps between the main motorway tunnel and the surface intersection at President Avenue
- Tunnel stubs for a future connection south to extend the M6
- A new intersection at President Avenue including the widening and raising of President Avenue
- Provision of new shared pedestrian and cycle paths and bridges including a bridge over President Avenue
- Minor adjustments to local roads in the project area
- Motorway support infrastructure including tunnel ventilation systems and motorway control centre
- New service utilities including a permanent power supply line into the tunnels from Canterbury substation.

#### B.3.1 Pedestrian and cycle infrastructure

The Project surface works includes the following pedestrian and/or cycle infrastructure (refer Figure B-2):

- ATC from Bestic Street, Kyeemagh to Chuter Avenue, Monterey, including Rockdale Bicentennial Parklands and the ATC bridge over President Avenue
- Marsh Street Park, adjacent the Arncliffe Motorway Operations Complex (MOC1)
- Regional (TfNSW) road upgrades:
  - southern tunnel entrance - President Avenue from Princes Highway intersection, Kogarah to O'Connell Street intersection, Monterey
  - MOC1 entrance - Marsh Street-Flora Street intersection, Arncliffe.
- Miscellaneous local (Bayside Council) road traffic management upgrades to improve pedestrian and cyclist safety and deter 'rat running':
  - Chuter Avenue pedestrian crossing upgrade (school zone), in proximity to Florence Street and Hawthorne Street, Ramsgate Beach
  - Chuter Avenue on-road cycle lane, in proximity to Emmaline Street intersection, Ramsgate Beach.
- Traffic calming:
  - O'Connell Street and Chuter Avenue, Monterey
  - Marshall Street, Kogarah.
- Civic Avenue footpath extension (eastern verge), from President Avenue intersection to Annette Avenue intersection, Kogarah.

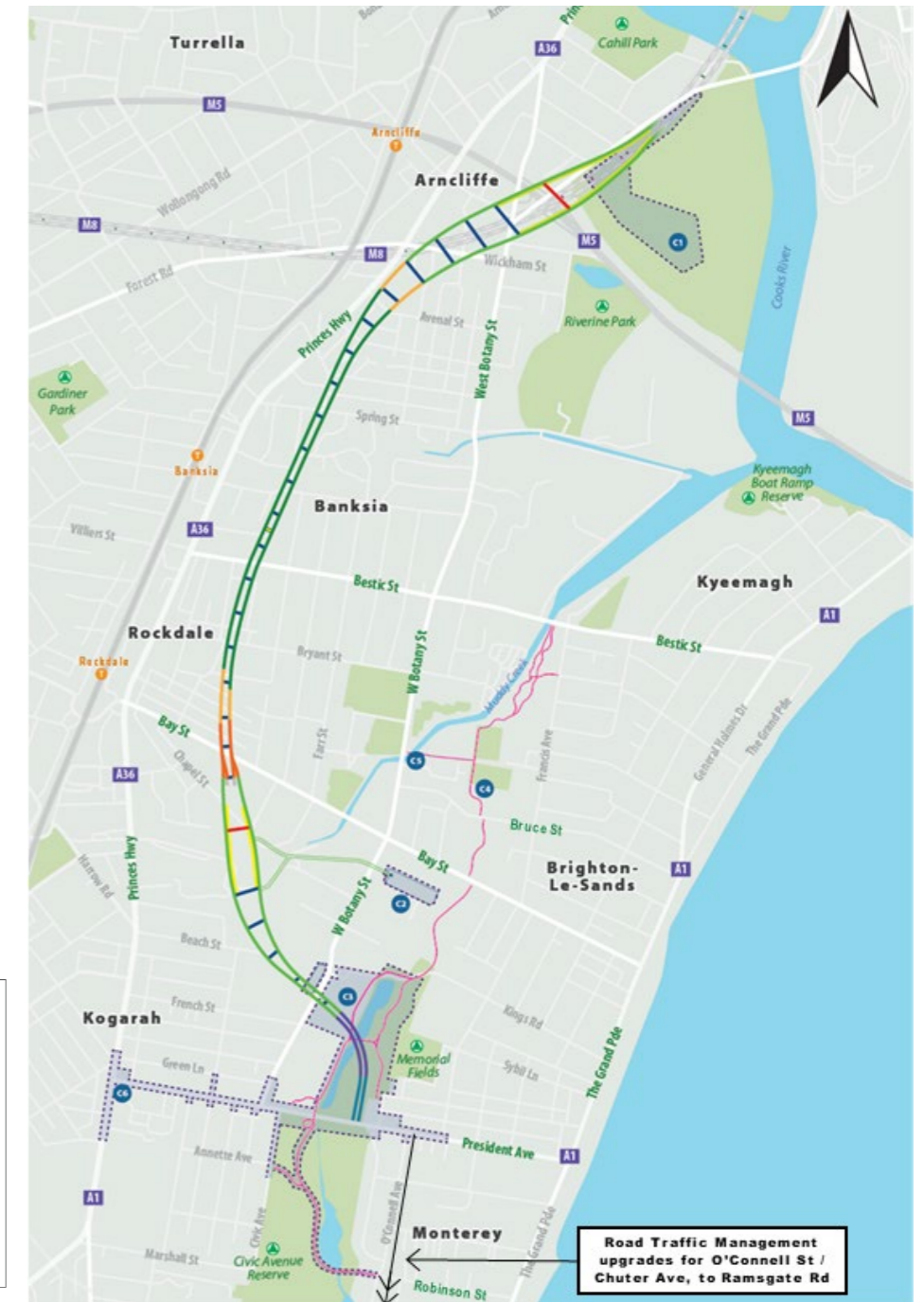
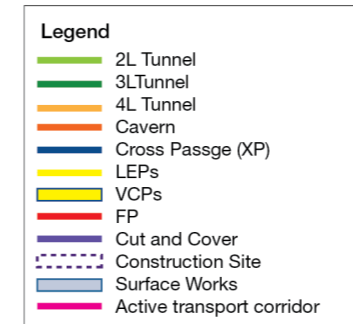


Figure B-2: Locations of Project works including pedestrian and cycle infrastructure

## B.4 Active Transport design principles

The Project has implemented active transport infrastructure in accordance with Austroads Guide to Road Design, Part 6A: Paths for Walking and Cycling, TfNSW Walking Space Guide and TfNSW Cycleway Design Toolbox.

To achieve cycling-friendly infrastructure, five internationally recognised design principles have been adopted: safe, connected, direct, attractive and comfortable. TfNSW includes an additional principle: adaptable.

These design principles (refer *Figure B-3*) have been used to effectively integrating the Project's cycle facilities into the urban and suburban environments and balance a range of requirements, including a variety of different user needs, and movement and place outcomes.

The Project has sought to provide infrastructure that achieves these six design principles to the highest quality possible, providing infrastructure that is suitable and accessible for all ages and abilities, and recognising the growth of active transport as viable mode of transport for a wider range of potential users.

### Urban design objectives

The design objectives for the implementation of successful pedestrian and cycle infrastructure have been to:

- To create an easy and enjoyable journey for all users
- Provide a consistent tree-lined corridor that provides shade for pedestrians and cyclists with safe set backs and sight distances
- Provide clear, easy and legible connections to the surrounding street and transport network, maximising east-west links
- Utilise native planting to enhance the path user experience including screen planting where required to screen residential properties and sensitive receivers
- Provide clearly marked entry points including signage and wayfinding making it easy to navigate
- Incorporate interpretive signage to provide information on key places and the history of the local area
- Incorporate public art and cultural story telling along the route
- Integrate resting points and 'dwell zones' including seating, bins, bicycle racks and drinking fountains
- Provide fitness zones including static exercise equipment
- Maximising public safety through CPTED principles, ensuring clear sight-lines and avoiding furtive spaces
- Provide lighting at night, with minimal light spill to residential areas
- Enable ease of access for maintenance and emergency access.



Figure B-3: Cycling-friendly Infrastructure Design Principles (source: TfNSW CDT, Dec 2020)



## B.5 Routes and connections

The Project's pedestrian and cycle infrastructure takes cognisance of the requirements of Conditions E150, E151, and E152, TfNSW regional planning and Bayside Council local planning to ensure place and network fit.

### B.5.1 Findings of Conditions E150, E151 and E152

#### Condition E150

The Project has addressed the requirements of Condition E150 by the inclusion of a 3m shared path along the northern side of President Avenue between West Botany Street to the west and O'Neill Street to the east. This shared path crosses the President Ave – M6 (tunnel entrance) intersection. A 3m shared path route is also provided around the tunnel entrance, through Rockdale Bicentennial Park.

#### Condition E151

The Project has addressed the requirements of Condition E151 by realignment of the ATC off road between Bruce Street and England Street (Kurnell Street) within open space. This ATC alignment has two road interfaces: at Bruce Street (unsignalised raised pedestrian crossing) and Bay Street (signalised pedestrian-cycle crossing).

#### Condition E152

The Project has addressed the requirements of Condition E152 - refer report prepared for TfNSW by EMM, dated July 2022, included as Annexure A. The PIR design has been retained and refined for the following reasons:

- the proposed design provides at-grade access from President Avenue which is not flood impacted - there is not sufficient space to achieve this on the eastern side of the wetlands given ground levels and areas prone to flooding
- the proposed design negates any new or perceived impacts on residents backing onto the wetlands, fronting Colson Crescent
- the proposed design provides better connectivity with the shared path to the north of President Avenue.

### B.5.2 Relationship to Regional and Local Planning

The Project overlays on the regional and local strategic cycleway corridors networks, as outlined in the following strategic planning documents:

- TfNSW Strategic Cycleway Corridors, Eastern Harbour City Overview, Program Update April 2022
- TfNSW South East Sydney Transport Strategy, August 2020
- Bayside Council Bike Plan, Strategic Cycling Network (Existing and Planned), June 2021
- Bayside Council Barton Park Masterplan (Final), 24 June 2020.

The Project will deliver parts of the regional and local strategic cycleway corridors networks and significantly improve active transport connectivity. Links forming part of the SCCN include:

- Bestic Street, Kyeemagh to West Botany Street, Rockdale, connecting Kyeemagh Cycleway and Barton Park Cycleway to Ador Park
- Bestic Street, Kyeemagh to Civic Avenue Reserve, Kogarah
- President Avenue from Princes Highway intersection, Kogarah to O'Connell Street intersection, Monterey
- Kings Road, Brighton-Le-Sands to West Botany Street, Rockdale (near intersection with French Street, Kogarah).

## B.6 Pedestrian and cycle engineering and safety standards

### B.6.1 Engineering and Safety Standards

The Project has been designed using national, State, and Council engineering standards (and guidelines) that ensure the safety and consistency of the pedestrian and cycle infrastructure – these are listed below. (Note: standards and guidelines pertaining to the structural design of pavements, bridges and boardwalks have not been listed.)

#### General

- TfNSW – Cycleway Design Toolbox
- TfNSW - Walking Space Guide, Towards Pedestrian Comfort and Safety
- Austroads – Cycling Aspects of Austroads Guides
- Austroads - Guide to Road Design (set), particularly:
  - Part 4: Intersections & Crossings
  - Part 6A: Pedestrian & Cyclist Paths
  - Part 6B: Roadside Environment
- Austroads - Guide to Traffic Management (set)
- Austroads - Guide to Road Safety (set)
- RTA – Technical Direction TDT 2011/01a: Pedestrian Refuges
- RTA - Guidelines for Road Safety Audit Practices
- AS ISO 31000 Australian Standard - Risk Management – Guidelines
- AS ISO 31010 Australian Standard - Risk management - Risk assessment techniques.

#### Equitable Access (Disability Discrimination Act 1992)

- AS 1428.1 Australian Standard – Design for access and mobility, Part 1: General requirements for access - New building work.

#### Signage and pavement markings

- Wayfinding
  - Bayside Council Sign Manual
  - Austroads - Research project AP-R492-15: Bicycle Wayfinding,
- 'Control' (regulatory and non-regulatory) and delineation
  - AS1742 Australian Standard – Manual of Uniform Traffic Control Devices (set), particularly:
    - AS1742.9 - Part 9: Bicycle Facilities (and TfNSW supplement)
    - AS1742.10 - Part 10: Pedestrian Control & Protection.
- RTA Delineation Guidelines (set), particularly:
  - Section 7 Transverse lines pedestrian facilities
  - Section 12 Pavement markings for bicycle facilities.

#### Lighting

- AS 1158 Australian Standard - Lighting for roads and public spaces (set), particularly:
  - AS 1158.3.1: Pedestrian area (Category P) lighting - Performance and design requirements
  - AS 1158.4: Lighting of pedestrian crossings.
- AS 4282 Australian Standard - Control of the obtrusive effects of outdoor lighting.

### B.6.2 Standards compliance

TfNSW has appointed an Independent Certifier for the Execution phase. The Independent Certifier's primary role is to provide subject matter specialist(s) to check compliance of the detailed design and construction against TfNSW requirements and the relevant standards.

The Independent Certifier's subject matter specialists have also participated in the safety and security processes described in *Section B.7*.



Image of separated cycle path, St Peters, Sydney

## B.7 Safety and security processes

Engineering and safety standards are supported by safety and security processes that predict the behaviour of the infrastructure and users (human factors) under a range of conditions. The Project has implemented the following processes to optimise the safety and security of pedestrian and cycle infrastructure:

- Safety in Design (SiD)
- Crime prevention through environmental design (CPTED)
- Road Safety Audits (RSA), including pedestrian and cycle facilities:
  - desktop audits of proposed pedestrian and cycle facilities
  - on-site audits of existing and proposed pedestrian and cycle facilities.

### B.7.1 Safety in Design (SiD)

SiD is a contemporary term commonly used in the context of the harmonised WHS-legislated duties of designers. The safe design of infrastructure is part of a wider set of design objectives, including practicability, aesthetics, cost and functionality. These objectives need to be balanced in a manner that, so far as is reasonably practicable, does not compromise the health and safety of those who use or work on the infrastructure over its life. The SiD process integrates control measures early and throughout the design phase to eliminate or, if this is not reasonably practicable, minimise risks to health and safety.

The Project has implemented a comprehensive SiD process during the design phase to ensure the safety of the community, including pedestrians, cyclists, motorists, park users, and personnel maintaining the operational facilities. During the detailed design phase, interactive SiD review workshops are being undertaken at each of the progressive design review gates: Developed Concept Design, Substantial Detailed Design, and Final Detailed Design. CPTED assessments (refer *Section B.7.2*) are being undertaken concurrently within the workshops. These workshops include TfNSW, Bayside Council, the D&C Contractor, the D&C Contractor's designers, and the Independent Certifier. The SiD process is underpinned by the risk management guidelines and assessment techniques in AS ISO 31000 and 31010 respectively. Identified risks are referred to the D&C Contractor's designers for evaluation and mitigation if necessary. In addition to the significant outcome of MCoA E151, the following are some examples of design amendments to improve safety outcomes for the community:

- pedestrian priority intersections have been provided at five key locations along the ATC - to increase safety of pedestrians, these intersections use a combination of signage and a contrasting pigmented concrete surface finish to alert and slow down cyclists
- a continuous separation fence has been provided on the southern boundary of the ATC within the AS Tanner Reserve, Monterey to manage the interface between the ATC and archery clubs
- amendment of the project boundary to eliminate the tight radii reverse curves ('s-bend') within Whiteoak Reserve, Brighton-Le-Sands
- CPTED principles have informed the repositioning of the fitness station proposed adjacent CA Redmond Fields, Rockdale to the public open space adjacent 272/274 Bay Street, Brighton-Le-Sands due to better passive surveillance from the main road at this location.

### B.7.2 Crime Prevention through Environmental Design (CPTED)

The Project has followed the NSW Police 'Safer by Design' CPTED strategies and principles. CPTED is a crime prevention strategy that focuses on the planning, design and place management principles. CPTED aims to create the reality (or perception) that the costs of committing crime are greater than the likely benefits.

CPTED employs four key strategies (adapted from Safer By Design - NSW Police Public Site):

- territorial reinforcement - places that feel owned and cared for are likely to be used, enjoyed and revisited
- surveillance - people feel safe in public areas when they can see and interact with others
- access control - treatments restrict, channel and encourage people and vehicles into, out of and around the development, with way-finding, desire-lines and formal/informal routes being important crime prevention considerations
- space / activity management - important way to develop and maintain natural community control. Space management involves the formal supervision, control and care of the development - all space, even well planned and well-designed areas need to be effectively used and maintained to maximise community safety.

Place management is important to achieving CPTED outcomes. Bayside Council, as the future infrastructure owner, operator and maintainer, has been extensively consulted to ensure that the infrastructure and facilities can be effectively operated and maintained.

The following are some of examples of measures taken in the design to implement CPTED principles and improve safety outcomes for the community:

- paths and road infrastructure provide passive surveillance where possible
- paths are fully lit in accordance with standards described in *Section B.6.1*
- massed planting areas are generally less than 1m in height adjacent the ATC and interconnected parklands to maintain sight lines
- tree species have been selected and positioned adjacent the ATC and interconnected parklands to maintain sight lines
- wayfinding includes a hierarchy of signage at primary and secondary decision points, supplemented with route reassurance signs, as described in *Section 7.3.1* of the UDLP.

### B.7.3 Safety Audits

Safety audits have been undertaken by qualified independent road safety auditor(s) in accordance with the procedures in the guidelines described in *Section B.6.2*. The findings have been referred to the D&C Contractor's designers for evaluation and mitigation.

Findings of the desktop audits are summarised below.

- ATC - in all 19 findings were identified including 4 of high level of risk, 12 of medium level of risk and 3 of low-level risk, which have been investigated and addressed
- Local road traffic management upgrades (including ATC road interfaces) - in all 28 findings were identified including 10 of high level of risk, 18 of medium level of risk and 2 of low-level risk, which were investigated and addressed
- President Ave / Princes Highway - in all 14 findings were identified including 7 of high level of risk, 5 of medium level of risk and 2 of low-level risk, which have been investigated and addressed.

On-site audits were undertaken in September and October 2022. The proposed ATC route was inspected, with particular emphasis placed on road interfaces. President Avenue / Princes Highway and local road traffic management upgrades were also inspected.

A key finding of the on-site audits was that there is no stop control on the exit from the CA Redmond Fields onto Bruce Street. This increases the risk of collision at the conflict point between the ATC (footpath on northern verge of Bruce Street) and the exit which could have a high volume of traffic on event days.



Artist's impression: President Avenue Bridge

## B.8 Pedestrian and cycle infrastructure details

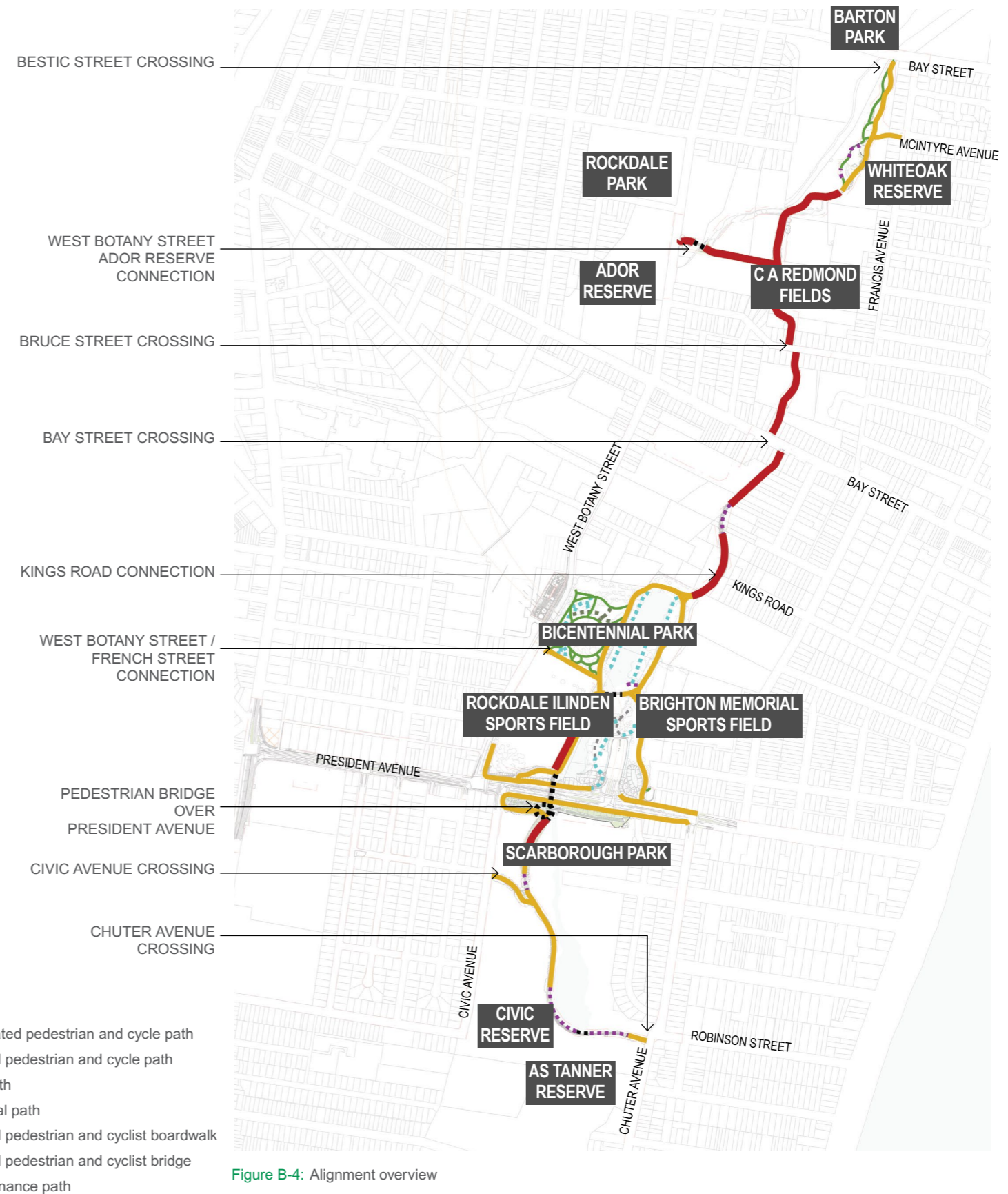
The key requirements for the shared paths and separated paths for the Project include the following:

- Separate pathways provided for cyclists and pedestrians where the pedestrian pathway width must be a minimum of 1.5m and cycle pathway width must be a minimum of 3.0m. The paths are separated with either a minimum 1m landscaped median, or line marking in constrained locations
- Shared pathways provided for cyclists and pedestrians where the width must be a minimum of 3.0m
- Even, level and slip resistant path surfaces with a maximum cross fall of 1v:40h
- Paths to seamlessly connect to existing infrastructure at the project extents
- Paths are to be adequately lit, with lighting integrated with the engineering and urban design
- Paths are to be enhanced with landscaping, including trees for shade and amenity, with rest stops and urban furniture.

Key lighting requirements to maximise community utilisation of pedestrian and cycle facilities include the following:

- Pedestrian and cycle paths shall be illuminated to facilitate safe use 24 hours of the day. The lighting is to also consider AS/NZS 4282 (Control of the obtrusive effects of outdoor lighting) when the ATC and other components of the network are located adjacent residential properties such that lighting spill is minimised
- Pedestrian and cycle paths must be provided with lighting that meets the standards described in Section B.6.1, and the project-specific feature lighting requirements
- Road crossings have been assessed against the applicable standards, with lighting upgraded to comply with current standards where required.

Figure B-4 provides a perspective of the ATC alignment.





Artist's Impression: Aerial view looking north over the Project Works (Existing site aerial photo shown grey)

### B.8.1 ATC

The proposed ATC consists of approximately 4.1 km of shared and separated pedestrian and cycle paths, including associated links and connections. The main north-south corridor links from Bestic Street in the north to Chuter Avenue in the south.

Connections have been provided to the local cycle and/or pedestrian network at the following locations:

- Francis Street at McIntyre Ave intersection
- West Botany Street at Ador Park
- Kings Road to south of Kings wetland
- West Botany Street at French Street
- O'Neill Street - at President Avenue
- Civic Avenue at Annette Ave intersection.

The development of the ATC is informed by the following scope of works and technical criteria:

- Cycle design speed of 30km/h where unconstrained, and 20km/h desirable minimum elsewhere
- Where 30km/h design speed cannot be achieved, signage and pavement markings warn cyclist of the impending reduced speed environment
- Priority given to safety of pedestrians and users of shared and activity spaces, with implementation of additional measures to give priority to pedestrians and/or slow down cyclists
- Alignment discontinuities limited where possible, such as 'cyclist must dismount' requirements
- One metre turfed outer verges provided to both path types, allowing clearance to vertical obstacles, and a corridor for lighting and barriers where required
- On ground concrete pathways as per TfNSW standard details
- Elevated structures described below are located along the length of the ATC and connections:

Bridges shall be constructed at the following locations:

- Muddy Creek Bridge
- President Avenue Bridge
- Bicentennial Park Ponds Bridge
- Chuter Crossing Bridge.

Bridge details:

- 3.6m width to include additional 300mm offsets to shared path cyclist safety rail
- 5.8m width to include additional 300mm offset to separated path cyclist safety rail on the cycle path side
- barriers – 1400mm balustrade (AS5100.1) and 1200mm cyclist safety rail (Austroads Part 6A)
- Deck type for President Avenue bridge consists of concrete, with all other to be constructed from FRP, with 'heel safe' micromesh grating
- Equitable access provisions include landings on the spiral ramp of the bridge over President Avenue and the approach to the Muddy Creek bridge.

Boardwalks are to be constructed in the following locations:

- Two "pedestrians only" boardwalks in Whiteoak Reserve
- Kings Wetland boardwalk
- Three boardwalks adjacent Scarborough Pond, south of President Avenue.

Pedestrian priority intersections have been provided where practical, with design measures taken to slow down cyclists and minimise conflict and collision to increase safety of pedestrians and other users of the activity spaces

The ATC interfaces with existing roads in multiple locations. These are described in detail in *Section B.8.1.1*, and summarised as following:

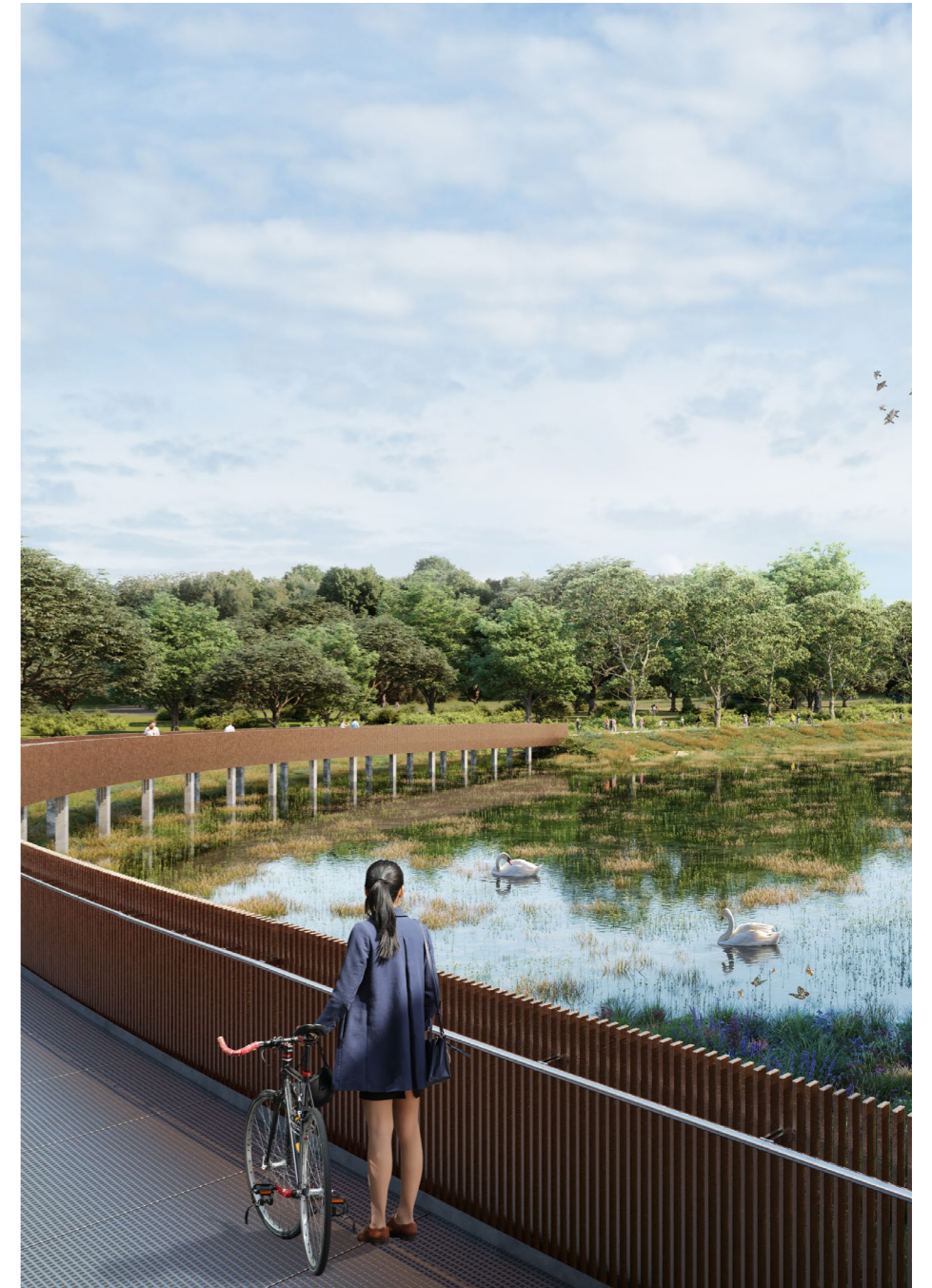
- grade separated
  - 1) President Avenue
- at-grade controlled crossing
  - 2) signalised combined pedestrian / cycle crossing – Bay Street and West Botany Street
  - 3) pedestrian crossings ('cyclists must dismount') – Bruce Street, Civic Avenue and Chuter Avenue
- at-grade uncontrolled, with pedestrian refuge
  - 4) Bestic Street

Provision of 'shared footway' signs to legalise cycle travel off road (on footpaths)

The proposed ATC alignment allows access to unique locations on the route, including:

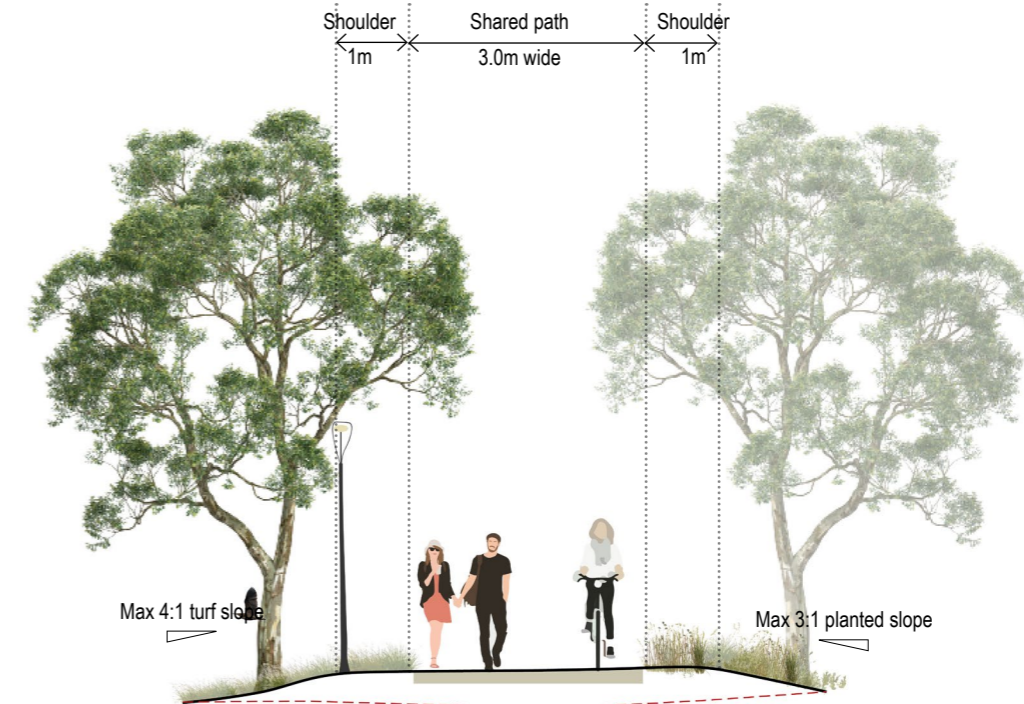
- Sydney Water Muddy Creek Naturalisation Project
- Viewing platforms and information signage, such as the location of the historical Moorefield racecourse (1888 – 1951)
- A new Fitness Station north of Bay Street.

Below are typical sections (refer *Figure B-5*) of the Bado-Berong Bridge and shared / separated paths.

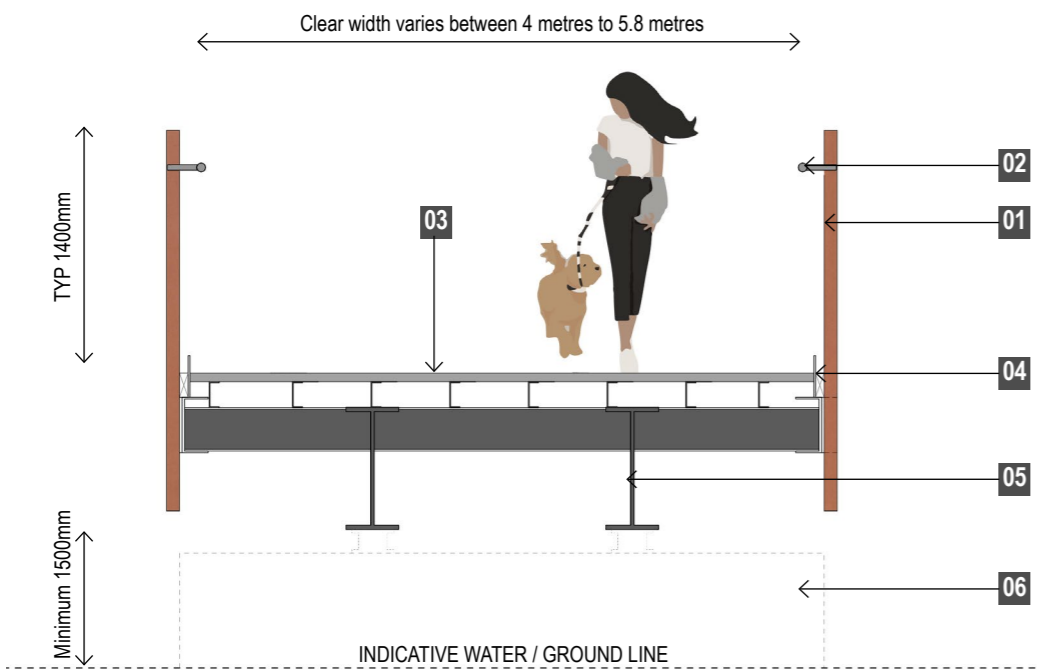


Artist's impression: Shared pedestrian and cyclist bridges and boardwalks across Patmore Swamp (Scarborough Park)

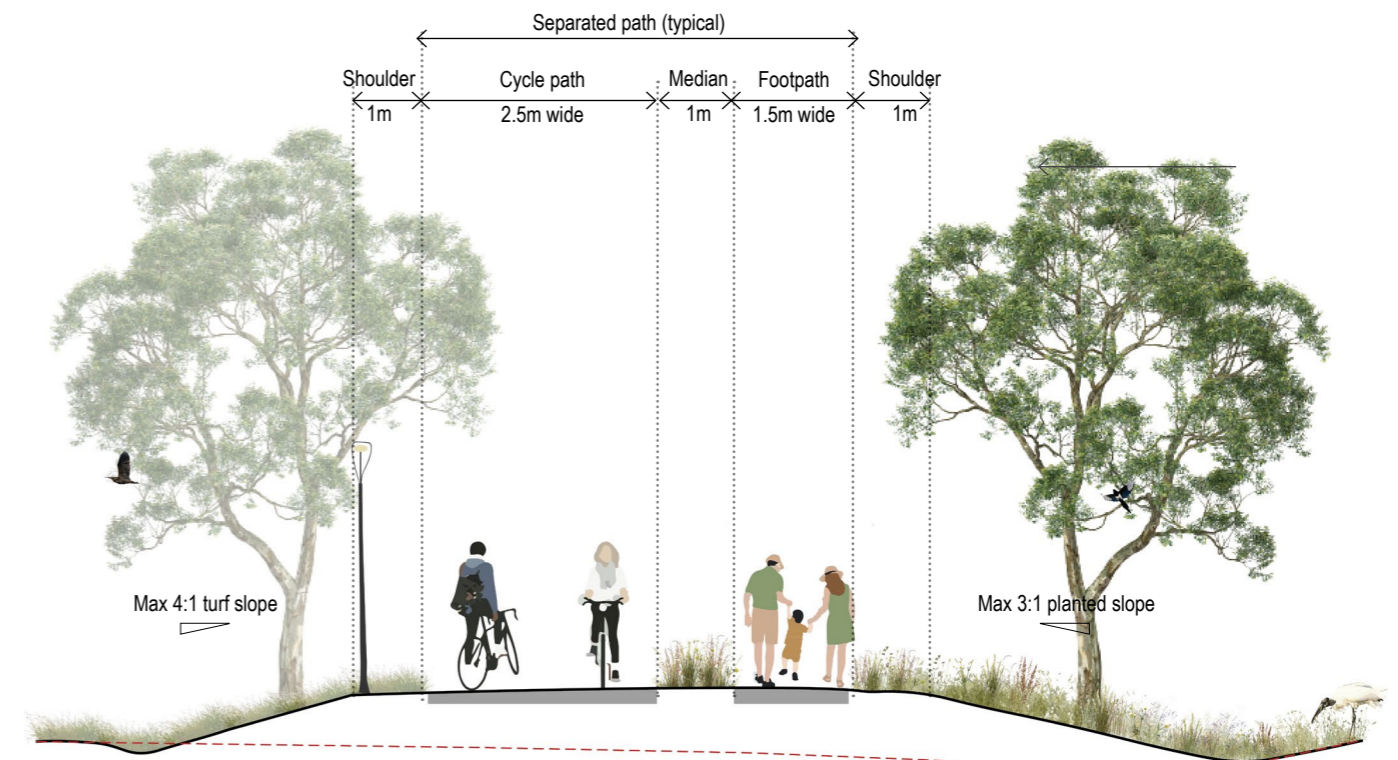
- Key
- 01** 1400mm high steel RHS balustrade posts
  - 02** Min 1200mm high cycle barrier rail
  - 03** Anti-slip FRP micro mesh grating to bridge deck
  - 04** Integrated LED strip lighting to accentuate balustrade at night
  - 05** Prefabricated steel structural frame setback behind the balustrade
  - 06** Reinforced in-situ concrete bridge abutment and wing walls (behind)



Shared user path



ATC bridge typical section



Separated cycle path.

Note: Where no separation is applied, the 1m wide median is removed

Figure B-5: Typical sections of the bridge over Bicentennial Park Ponds and shared / separated paths (with 1m separation typical)



### B.8.1.1 Road interfaces

There are several locations where the ATC interfaces with existing roads. The type of road crossing is dictated by road hierarchy and traffic volumes. Where possible priority is given to pedestrians and cyclists.

The ATC includes the following road interfaces, with the crossing treatments summarised in *Table B-5*.

#### Bestic Street

Bestic Street is a significant traffic route. The northern limit of the ATC connects into the local road network at Bestic Street.

#### West Botany Street – Ador Park

The ATC provides a link from the main north-south ATC to West Botany Street, with access to Ador Park. A new bridge is to be built over the Muddy Creek canal to allow connection from the ATC to West Botany Street and Ador Park.

Where the longitudinal grades exceed 3%, landings have been provided in accordance with AS1428.1, to provide rest areas and assist with accessibility for wheelchairs users.

#### Bruce Street

The ATC north-south alignment crosses Bruce Street by means of a proposed raised pedestrian crossing. Bruce Street is a residential street, with vehicular access to CA Redmond Fields.

#### Bay Street

The ATC north-south alignment crosses Bay Street by means of a signalised pedestrian crossing. The link across Bay Street provides continuation of the off-street alignment of the ATC by connecting the open space to the north, with an off-road route to the Kings Wetland to the south.

#### President Avenue Bridge

The ATC continues south from Rockdale Bicentennial Park and crosses President Avenue by means of a concrete bridge with 5.5m separated path. The bridge crossing of the ATC has an approximate maximum grade of 5%. Where the longitudinal grades exceed 3%, landings have been provided in accordance with AS1428.1, to provide rest areas and assist with accessibility for wheelchairs users.

The bridge is grade separated from President Avenue, which allows the movement of ATC users over President Avenue without having to interact with road traffic. This part of the network will be upgraded to a 3m shared path on both the northern and southern verges along President Avenue in this location.

#### Civic Avenue

A connection is provided to Civic Avenue off the ATC through the Civic Avenue Reserve. The connection consists of a 3m shared path and provides a crossing of Civic Avenue to the west, aligning with the eastern verge of Annette Avenue.

#### Chuter Avenue

The ATC connects to the local road network at its most southern extent to Chuter Avenue just south of Robinson Street.

Table B-5: Crossing Treatments

| Location                                     | Configuration   | Type of Crossing                            | Location                             | Configuration  | Type of Crossing           |
|--|---|---|--------------------------------------|--|----------------------------|
| Bestic Street                                | Two-lane divided (one lane each way) – east of Francis Street   | Refuge Island - with holding rails          | Civic Avenue                         | Two-lane undivided (one lane each way)   | Pedestrian Crossing        |
|  | Three-lane divided (two + one lane each way) – west of Francis Street   |   |                                      | 50kph speed limit  |                            |
|  | 60kph speed limit   |   |                                      | Scope of works:  |                            |
|  | Scope of works:   |   |                                      | <ul style="list-style-type: none"> <li>Shared Path users right of way</li> <li>Kerb blisters in three locations of the crossing between the kerb ramp and the pedestrian crossing</li> <li>Cyclists must dismount</li> <li>Aligned with Annette Avenue footpath</li> <li>Associated signage and linemarking</li> </ul> |                            |
| West Botany Street (connection to Ador Park) | Two-lane divided (two-lanes each way)   | Signalised midblock pedestrian crossing     | Chuter Avenue (near Robinson Street) | Two-lane undivided (one lane each way)   | Raised Pedestrian Crossing |
|  | 60kph speed limit   |   |                                      | 60kph speed limit  |                            |
|  | Scope of works:   |   |                                      | Scope of works:  |                            |
|  | <ul style="list-style-type: none"> <li>On demand pedestrian crossing</li> <li>40m of upgraded footpath to 3m wide shared path on western verge</li> <li>Associated signage and linemarking</li> </ul>   |   |                                      | <ul style="list-style-type: none"> <li>Shared Path users right of way</li> <li>Aligned immediately south of Robinson Street</li> <li>Cyclists must dismount</li> <li>Associated signage and linemarking</li> </ul>   |                            |
| Bruce Street                                 | Two-lane undivided (one lane each way)  | Raised midblock pedestrian crossing         |                                      |  |                            |
|  | 50kph speed limit   |   |                                      |  |                            |
|  | Scope of works:   |   |                                      |  |                            |
|  | <ul style="list-style-type: none"> <li>Shared Path users right of way</li> <li>Cyclists must dismount</li> <li>Shared access with Rugby Union Club</li> <li>Approximately 30m upgrade of footpath to 2.5m wide shared path on northern verge.</li> <li>Removal of one established tree on northern verge</li> <li>Associated signage and linemarking</li> </ul> |   |                                      |  |                            |
| Bay Street                                   | Two-lane divided (one lane each way)  | Signalised Pedestrian Crossing              |                                      |  |                            |
|  | 60kph speed limit   |   |                                      |  |                            |
|  | Scope of works:   |   |                                      |  |                            |
|  | <ul style="list-style-type: none"> <li>On demand pedestrian crossing</li> <li>Approximately 40m upgrade of footpath to 3.5m wide shared path on southern verge</li> <li>Remove one trees on southern verge, trim one tree for sight lines</li> <li>Associated signage and linemarking, including adjustment of school zone signage</li> </ul>                   |   |                                      |  |                            |
| President Avenue Bridge                      | No interface with President Avenue  | Grade separated bridge, with separated path |                                      |  |                            |
|  |   |   |                                      |  |                            |
|  | Scope of works:   |   |                                      |  |                            |
|  | <ul style="list-style-type: none"> <li>Bridge with associated earthworks</li> <li>Ramps to bridge crossing, with spiral ramp on southern side</li> <li>3m shared path on President Avenue northern and southern verges in vicinity of bridge, with connections to bridge on north and south verge</li> </ul>  |   |                                      |  |                            |

### B.8.1.2 Off-road sections

The ATC alignment has been designed that most of the route is off-street, other than connections to, and crossing of local roads. Between these road interfaces the ATC follows existing parklands and open space, which are described in more detail below and in *Table B-6*.

#### Whiteoak Reserve

The ATC alignment immediately south of Bestic Street consists of a pedestrian path through the Sydney Water Muddy Creek Naturalisation Project and a cycle path. The two paths converge at the southern end of Whiteoak Reserve to form a median separated path that continues south to the sports fields.

There is a shared path connection to Francis Avenue.

#### Sports fields (Rockdale Rugby Club and St George Netball Association)

A line marked separated path is located to the west of the rugby fields. A line marked separated path is also adjacent the CA Redmond Field vehicular access off Bruce Street. A median separated path connects these lengths of path.

A line marked separated path connects from the junction to Muddy Creek bridge, between the netball courts and Brighton Terraces northern boundary. A median separated path continues west over Muddy Creek bridge to the West Botany Street signalised crossing.

#### Bruce Street to Bay Street

The ATC alignment between Bruce Street and Bay Street enters a grassed paddock with a wooded area of mature trees along its western edge. The paddock is enclosed by St Thomas More Catholic School on one side, with the other sides consisting of the back fencing of residential dwellings.

A fitness station is located about 60m north of Bay Street..

#### Kings Wetland

This section of ATC runs from the Bay Street connection to the existing Kings Road connection. The configuration here is a 5.5m separated path, with a 5.8m boardwalk structure at Kings Wetland.

#### Civic Avenue Reserve

The ATC proceeds to the south from President Ave to the west of the Scarborough Pond. The configuration here is a 3m shared path, with three 3.6m boardwalk structures, and a 3.6m bridge over Chuter Crossing.

The ATC continues on to connect to Chuter Avenue just south of Robinson Street.

The below table provides details of the ATC infrastructure at off-street locations.

Table B-6: Off-Street Locations

| Location  | Configuration  | Type of Crossing                                     |
|---|--|--|
| Whiteoak Reserve  | Dedicated Cycle Path – 350m  | Bestic Street to sports fields                       |
|   | Dedicated Pedestrian Path – 360m   |  |
|   | Separated Path – 130m  |  |
|   | Two pedestrian-only boardwalks   |  |
| Sports fields (Rockdale Rugby Club and St George Netball Association) | Separated Path (line marked) - 220m  | Whiteoak Reserve to Bruce Street                     |
|   | Separated Path (median) - 80m  |  |
| Sports fields (Rockdale Rugby Club and St George Netball Association) | Separated Path (line marked) 170m  | West Botany Street connection (Muddy Creek crossing) |
|   | Separated Path (median) 60m  |  |
|   | Muddy Creek Bridge   |  |
| Bruce Street to Bay Street  | Separated Path – 220m  | Bruce Street to Bay Street                           |
| Kings Wetland   | Separated Path – 360m  | Bay Street to Kings Road                             |
|   | Boardwalk structure  |  |
| Rockdale Bicentennial Park (West Botany Street connection)            | Shared Path – 150m   | ATC to West Botany Street                            |
| Rockdale Bicentennial Park  | 5.5m Separated Path – 70m  | Kings Road to President Avenue                       |
|   | 4m Shared Path - east of ponds, 3-way intersection to Bado-Berong Creek Bridge - 250m  |  |
|   | 3m Shared Path - east of ponds, Bado-Berong Creek Bridge to O'Neill Street – 270m  |  |
|   | 3m Shared Path - west of ponds to start of bridge – 480m   |  |
|   | Bado-Berong Creek Bridge   |  |
|   | 5.5m Separated paths with varying median width between cyclist and pedestrian paths at President Avenue bridge approach – 120m |  |
|   | Link from to President Avenue Bridge to President Avenue   |  |
| Civic Avenue Reserve  | Spiral President Avenue bridge ramp with shared path connection to Civic Avenue  | President Avenue to Chuter Avenue                    |
|   | 5.5m Separated path – 140m   |  |
|   | 3m Shared Path – 570m  |  |
|   | 3m Shared path link to Civic Avenue – 110m   |  |
|   | Four boardwalks  |  |
|   | Bridge over Chuter Crossing  |  |



Off-road separated pedestrian and cycle path

## B.8.2 Rockdale Bicentennial Park

Rockdale Bicentennial Park active transport network is to be upgraded with the Project works. The following components improve the experience for pedestrians and cyclists:

- Reinstatement of the existing east-west bridge connection between Rockdale Ilinden Sports Centre and the Brighton Memorial Playing Fields
- New formalised pedestrian entries into the community lawn via existing carparks off west Botany Street
- A secondary network of paths that promotes informal pedestrian circulation around the Rockdale Bicentennial Park
- Fences providing safe separation between user groups.



Artist's impression: Bicentennial Park

## B.8.3 Marsh Street Park

Marsh Street Park is accessed by pedestrians and cyclists off Marsh Street just north of the main vehicular access to the site. The path consists of a 4.5m shared path which splits into a loop after about 270m from the entry off Marsh Street. The parklands are surrounded by the Kogarah Golf Course.

The scope of work provides for a 4.5m shared path that circumvents the extents of the Parklands with the following features:

- On ground concrete pathways as per TfNSW standard details
- Interface with access trails to ecological areas
- Frog pond crossing over breeding habitat
- Access to playing fields
- Access to recreational facilities, such as picnic area, playground and pump track
- Access to new fitness station
- Path lighting, including flood lights
- Signage and linemarking.

The Marsh Street Park shared path does not form part of the regional or local bike network.



Artist's impression: Marsh Street Park and MOC1 Arncliffe Motorway Operational Complex

## B.8.4 Regional road network upgrades

### President Avenue

The pedestrian and cycle infrastructure proposed for President Avenue includes:

- Provision for a 3m shared path on both the northern and southern verges between West Botany Street and O'Connell Street. There are connections from President Avenue Bridge connecting to the President Avenue shared paths on both north and south verges
- Formalisation of a 2.5m footpath on the southern verge between Moorefield Avenue and Oakdale Avenue in front of the commercial centre
- Intersection upgrade at Princes Highway, including new 3m shared path between President Avenue and Green Lane, and between President Avenue and South Street
- Existing verges will remain untouched from O'Connell Street through to the end of Project works at Crawford Road
- Limited improvement of pedestrian and cycle connectivity is provided along President Avenue from Princes Highway to Civic Ave and West Botany Street due to existing constraints
- The proposed shared path on the southern side of President Avenue terminates at the upgraded intersection with O'Connell Street. From this intersection there is an existing section of 2m wide shared path to the Crawford Road intersection
- On the northern verge of President Avenue, the new shared path terminates at the kerb ramp of the signalised pedestrian crossing from O'Connell Street, and ties into the existing 1.5m footpath.

### Princes Highway

The Princes Highway intersection with President Avenue is to be upgraded with the Project works. The following is to be noted with regards the provisioning of pedestrian and cycle infrastructure:

- The eastern verge north of and south of the President Avenue intersection is to have an upgraded 3m shared user path
- The western verge is unaffected by the upgraded intersection, retaining the existing footpath infrastructure
- Due to the existing pedestrian bridge pier there is a localised reduction in shared user path width to 1.8m
- The Princes Highway intersection upgrade ties back into the existing 3 lane both direction configuration after 230m south of President Avenue and 120m to the north of intersection.

### Marsh Street – Arncliffe

A reconfiguration of the Marsh Street / Flora Street intersection is to be undertaken to provide a controlled and safer access to the new MOC1 and Marsh Street Park. The intersection is to be reconfigured for left in / left out access.

The design of Marsh Street intersection includes:

- Adjustment of the Marsh Street central median to remove the right turn slip lane and remove right turn movement into the MOC Facility and the Marsh Street Park carpark
- Minor modifications to the existing pedestrian crossing, with the removed traffic movement allowing for improved phasing of signals for pedestrians and cyclists
- Associated linemarking and signage.



Artist's impression: Aerial view looking east over President Avenue

## B.8.5 Local road network upgrades

### Local road traffic management

TfNSW are in conjunction with the Bayside Council, implement Local Road Traffic Management measures, such as heavy vehicle load limits, raised pedestrian crossings and speed humps, to reduce traffic demand on O'Connell Street/Chuter Avenue and Civic Avenue/Marshall Street.

#### O'Connell Street

Minor local surface works are planned for O'Connell Street, and include:

- Reinstatement of line marking
- Installation of rubber speed cushions immediately south of Banks Street, with associated signage.

These works will have no impact to the existing pedestrian and cyclist connectivity

#### Chuter Avenue

Local surface works are planned for Chuter Avenue, including the crossing immediately south of Robinson Street. This crossing has been discussed under *Section B.8.1.1*. The Chuter Avenue scope covers the length of road from President Avenue in the north to Ramsgate Road in the south.

Other proposed works include:

- Removal and reinstatement of line marking
- Improvement works to the existing roundabout at the intersection with Barton Street, including resurfacing and associated signs and line marking. Signage limiting heavy vehicle access is to be provided at this intersection
- Installation of a rubber speed hump immediately north of Hollywood Street, with associated signage
- Realignment of the intersection of Emmaline Street and Chuter Avenue, including the addition of a cycle lane
- Construction of a new raised pedestrian crossing immediately south of Florence Street, replacing the existing refuge island. Associated signage and line marking.

These works will have no impact to the existing pedestrian and cyclist connectivity or affect the Bayside Council local network. Pedestrian footpaths remain unchanged, with on-street line marking indicating the cycling alignment.

#### Civic Avenue

Local surface works are planned for Civic Avenue, including the crossing immediately south of Annette Avenue. This crossing has been discussed under *Section B.8.1.1*. The Civic Avenue scope covers the length of road from President Avenue in the north to approximately 110m south of Annette Avenue.

Other proposed works include:

- Construction of a new 1.5m minimum width footpath on the eastern verge
- New line marking and signage
- Reinstatement of line marking.

These works will have no impact to the existing pedestrian and cyclist connectivity, with active transport users more likely to use the ATC once constructed in the Civic Reserve.

#### Marshall Street

Local surface works are planned for Marshall Street.

Proposed works include:

- Construction of two new speed humps, one west of Lachal Avenue, and the other at Oakdale Avenue. Works include associated signage, line marking, and landscaping
- New line marking and signage
- Reinstatement of line marking.

These works will have no impact to the existing pedestrian and cyclist connectivity. Pedestrian footpaths remain unchanged, with no specific cyclist on-street demarcation.



Artist's impression: Pedestrian and cycle path near Muddy Creek

## B.9 Signage and wayfinding

Signage for the pedestrian and cycle paths has been developed in accordance with the standards and guidelines outlined in *Section B.6.1* and in consultation with TfNSW Active Transport Unit and Bayside Council.

All signage will be positioned to not present a hazard or obstruction to pedestrians, cyclists, wheelchairs, etc.

### Wayfinding

Wayfinding and signage has been developed based on best practice principles and strategic decision making to ensure that information spaces are effectively navigable for pedestrians and cyclists (elements that communicate wayfinding information and help the user get from Point A to Point B).

Throughout the network of open space, a variety of signage types are required, each varying in content, scale and purpose - from orientation and direction signage to identification signage. We have developed the signage and wayfinding systems to provide information for users to:

- Know where they are, in a unique place
- Know their destination
- Follow the best route to their destination
- Recognise their destination upon arrival
- Find their way back out.

The form, materiality, arrangement and location of all wayfinding signage pieces has been prepared in accordance with council guidelines, principally Bayside Council Sign Manual Volume 1 and Volume 2, August 2020.

The signage and wayfinding strategies have been developed in accordance with local council guidelines and signage design manuals as follows with the principles for the ATC and interconnected parkland paths outlined as follows:

- Primary decision points – large totem signs located where pedestrian and cycle paths commence or intersect with other major routes, providing primary information and giving directions and distances to key destinations, with maps to enhance the directional information
- Secondary decision points – pole and blade directional signs located where there is an option for a change of direction, particularly at ATC path junctions and potentially where public roads intersect the ATC
- Route reassurance signs – small totem signs located to reinforce directional information and distances between decision points.

## ‘Control’ (regulatory and non-regulatory) and Delineation

‘Control’ and delineation signage and pavement markings will be provided to assist with prioritisation of pedestrian and cyclist movements, and to slow down cyclists to minimise conflict and collisions. The gentle grades and open sight lines of the ATC and interconnected parklands has allowed the use of these sign types and pavement markings to be limited, thus reducing visual clutter in the parkland setting.

Regulatory signage will be located at the start and end of a facility. Non-regulatory signage - warning, guidance, and advisory signage – will be located to provide advance indication of changed cycling conditions or potential hazards.

Pedestrian priority intersections have been provided at five key locations along the ATC. To increase safety of pedestrians, these intersections use a combination of signage and a contrasting pigmented concrete surface finish to alert and slow cyclists down. The pigmented concrete surface finish should achieve a minimum 30% desired level of contrast to meet general equitable access provisions, whilst remaining sympathetic to the landscaping and urban design principles.

## B.10 Landscape works

Details of the landscape works for the Project are provided in the Urban Design and Landscape Plan. However, in summary landscaping works for the ATC (including Rockdale Bicentennial Park) and Marsh Street Park includes the following features to enhance the user experience:

- tree planting for shade and amenity
- turf and massed planting for amenity and in the median of separated path sections
- materials and surface finishes
- rest stops and urban furniture
- ATC bridges and boardwalks have a strong urban design aesthetic.

For user safety and security, the landscaping design has considered CPTED principles (refer *Section B.7.2*). The landscaping design also minimises leaf litter and debris on the paths.

## B.11 Timing and staging (construction)

The pedestrian and cycle infrastructure described in *Section B.8* will be progressively opened to the public as they are completed. All pedestrian and cycle infrastructure will be completed before operation of the project commences.

The ATC works has been separated into four discrete areas:

- Area 1 – Muddy Creek, Bestic Street to Bruce Street
- Area 2 – Bruce Street to Kings Road
- Area 3 – Kings Road to President Avenue
- Area 4 – President Avenue to Chuter Avenue.

The construction of the ATC works is proposed to be delivered in three stages:

- Stage 1 shall include Areas 2 and 4, with works scheduled to commence early 2023
- Stage 2 shall include Area 3, with works scheduled to commence late 2023, after works on the tunnel portal are sufficiently complete
- Stage 3 shall include Area 1, with works scheduled to commence early 2024, on completion of the Sydney Water Muddy Creek Naturalisation Project.