



**NOR 4A AND 4B - SH20 / SH20B INTERCHANGE TO ORRS ROAD**

- Outcomes    ● Opportunities
- 1 **Ecological connectivity** - Landscape outcomes should reinforce the wider vegetation patterns of the local open spaces and support ecological connectivity and biodiversity in the local environment.
- 2 **Identity drivers** - Key local community, landscape and identity drivers should be identified, developed and integrated with the adjacent land use functions and future design response.
- 3 **CPTED** - Future design should incorporate CPTED principles including clear sightlines, good levels of lighting and passive surveillance.
- 4 **Active mode permeability** - Corridor permeability for active modes that addresses cross corridor connectivity (midblock crossings), modal priority and permeable access to destinations such as centres, transport interchanges, open spaces and community facilities.
- 5 **Active mode legibility and priority** - Legibility, connectivity demands, safety and modal priority for active modes should be addressed at intersections.
- 6 **Bridges** - Consideration of visual integration, interface and sense of place for bridge structure.
- 7 **Removal of Notable Trees** - Loss of canopy square metre must be replaced.
- 1 **Residual land** - Opportunity to demonstrate how any residual land portions following the construction of the Project are redefined and integrated with the expected future land use function.
- 2 **Wider connectivity** - Opportunity to reinforce connections to the wider community and landscape features.
- 3 **Enhancement** - Opportunity for ecological enhancement and tree planting.

**OUTCOMES AND OPPORTUNITIES PLAN - SHEET 02 OF 02**

**OUTCOMES**

- Stormwater management outcomes should demonstrate integration of the stormwater raingardens and wetlands within the corridor and ensure an appropriate interface with adjacent land uses.
- High density residential and mixed-use integration / interface that enables buildings and spaces to positively address and integrate with the corridor.
- Intersection arrangement that addresses multi-modal priority, safety and legibility.
- Cross corridor active mode connection.
- Landscape outcomes should provide replace and augment canopy shading to the corridor. Outcomes to reflect and enhance the local character inherent in the built, natural and cultural qualities of the location within the corridor.
- Interface and visual / landscape buffer considerations for retained industrial, business and mixed use zones

**LEGEND**

- Designation Boundary
- Residential - THAB
- Business - Light Industry Zone
- Business - Future Centre Zone
- Business - Metropolitan Centre Zone
- Business - General Business Zone
- Mixed Use
- Public Open Space
- Proposed Bus Rapid Transit Stop
- Train Station
- School

Figure 11: NoR 4a and 4b urban design outcomes and opportunities Sheet 02 of 02

# Appendix A

## Urban Design Evaluation Principles

For urban design commentary common to all NoRs, refer to Table 3

## 1.1 NoR 1 Urban Design matters

Table 4: Urban design evaluation for NoR 1 – Botany Town Centre to Rongomai Park

Principle	Explanation	Application to NoR 1
<b>ENVIRONMENT</b>		
<b>1.1 Support and enhance ecological corridors and biodiversity</b>	Mitigate the effects on or enhance existing ecological corridors through the placement and design of movement corridors	<ul style="list-style-type: none"> <li>Opportunities within the immediate environment of NoR 1 to support ecological connectivity and biodiversity are identified in the Airport to Botany: <i>Assessment of Ecological Effects</i> and include:                             <ul style="list-style-type: none"> <li>Artificial wetlands and swales within the corridor;</li> <li>Rongomai Park; and</li> <li>where the corridor crosses tributaries of Otara Creek and Taraire Creek.</li> </ul> </li> <li>Refer to the <i>Airport to Botany: Assessment of Ecological Effects</i> for details of these opportunities.</li> <li>There is one watercourse bridge crossing in NoR 1 at an unnamed stream crossing near Rongomai Park that presents an opportunity to reinforce broader connectivity outcomes for ecology and water quality by minimising the stream interruption and ensuring a connected natural system.</li> <li>There is also opportunity to consider future stream enhancement and fish passage particularly at Kellaway Drive Reserve</li> </ul>
<b>1.2 Support water conservation and enhance water quality in a watershed</b>	Take into account and work with the existing watershed as part of a whole system.	The proposed typical corridor cross section and designation boundary allows spatial provisions where adjacent to existing service lanes and other selected locations to provide natural drainage to stormwater raingardens to address water quality and reduce hard engineering solutions. These locations exist on both the eastern and western edges of Te Irirangi Drive from Ch2600 to Ch6850.
<b>1.3 Minimise land disturbance, conserve resources and materials</b>		Refer to Table 3 in relation to this design principle.
<b>1.4 Adapt to a changing climate and respond to the microclimatic factors of each area</b>		Refer to Table 3 in relation to this design principle.
<b>SOCIAL</b>		

<p><b>2.1</b> <b>Identity and place</b></p>	<p>The identity or spirit of place is generally acknowledged as the unique amalgam of the inherent built, natural and cultural qualities of a place. Responding to identity in the location and type of new corridors can provide a sense of continuity and contribute to our collective memory.</p> <p><b>Local Identity</b></p> <p>Locate the station facilities to maximise the placemaking potential and enhance local identity.</p>	<ul style="list-style-type: none"> <li>• The further identification, development and integration of key local community and identity drivers within NoR 1 should be addressed in future design stages. Key NoR 1 local identity locations and functions include: <ul style="list-style-type: none"> <li>– The Business – General Business Zone, Business – Neighbourhood Centre Zone and Business – Light Industrial Zone at Bishop Dunn Place;</li> <li>– Sancta Maria Primary School and College at 317 Te Irirangi Drive, Clover Park;</li> <li>– Open space linkages along Otara Creek Reserve and Tributaries to Barry Curtis Park;</li> <li>– Links to the adjacent Ormiston Town Centre (Business – Town Centre Zone) on Ormiston Road;</li> <li>– Botany Junction shopping centre (Business – Local Centre Zone) at 277 Te Irirangi Drive;</li> <li>– Rongomai Park / Recreation Reserve;</li> <li>– a built form and corridor interface response to station locations and built form; and</li> <li>– The response to distinctive landscape character qualities of open spaces, stream and conservation zones.</li> </ul> </li> </ul>
<p><b>2.2</b> <b>Respect culturally significant sites and landscapes</b></p>		<p>Refer to Table 3 <b>Error! Reference source not found.</b> in relation to this design principle.</p>
<p><b>2.3</b> <b>Adaptive corridors</b></p>	<p>Corridors should demonstrate flexibility to respond to changes in their function and physical interfaces. Consider an adaptive approach in the way strategic corridors are designed to be able to respond to changes in land use, the way we move around or utilise technology over time.</p> <p><b>Future Growth</b></p> <p>Consider the existing and future movement and place context in the location of bus stations and transport interchange and the ability of the design to accommodate change over time.</p>	<p>If practicable, future land integration post construction should be considered to support any proposed development / redevelopment adjacent to the NoR 1 corridor.</p>

<p><b>2.4</b> <b>Social cohesion</b></p>	<p>Provide clear, effective and legible connectivity between community and social functions.</p>	<ul style="list-style-type: none"> <li>• The proposed corridor alignment and function can deliver a positive contribution to the sense of belonging and participation, as well as community resilience by supporting direct access to existing local, neighbourhood and town centres, schools, community functions and open spaces. Examples of school, community and business functions that will benefit from improved connectivity delivered by the project within NoR 1 include: <ul style="list-style-type: none"> <li>– Sancta Maria Primary School and College;</li> <li>– Rongomai Park / recreational reserve; and</li> <li>– Barry Curtis Park.</li> </ul> </li> <li>• To enable equitable local connectivity and cross corridor access to commercial centres and areas of high density, further development at the detailed design stage should be undertaken of crossing points for multi-lane intersections and potential midblock crossings including: <ul style="list-style-type: none"> <li>– Kellaway Drive / Brinlack Drive (upgraded existing);</li> <li>– Redcastle Drive intersection;</li> <li>– Smales Road intersection;</li> <li>– East Tamaki Road pedestrian crossing location (upgraded existing);</li> <li>– Accent Drive intersection;</li> <li>– Bishop Dunn Place / Sancta Maria Way intersection;</li> <li>– Ormiston Road intersection;</li> <li>– Vidiri Court pedestrian crossing (New);</li> <li>– Whetstone Road pedestrian crossing (upgraded existing); and</li> <li>– Belinda Avenue intersection.</li> </ul> </li> </ul>
<p><b>2.5</b> <b>Safety</b></p>	<p>Provide a safe and convenient network of routes accessible to people of all ages and abilities.</p> <p><b>Universal Access</b></p> <p>Focus on the needs of the customer by placing importance on the spatial requirements that provide for universally inclusive and safe facilities with good physical and visual links.</p>	<ul style="list-style-type: none"> <li>• Refer to Table 3 in relation to Safety recommendations. In addition to these recommendations, a CPTED audit of the NoR 1 project should address, at a minimum, the current identified CPTED risks including: <ul style="list-style-type: none"> <li>– The existing underpass environment at Kellaway Drive / Brinlack Drive;</li> <li>– Pedestrian overpasses at East Tamaki Drive and Whetstone Road; and</li> <li>– Under bridge environments at the Otara Creek tributary overbridge and culverts.</li> </ul> </li> </ul>
<p><b>BUILT FORM</b></p>		
<p><b>3.1</b></p>	<p>Locate stations/stops and corridors within walking distance of higher density</p>	<p>The proposed NoR 1 station locations at Smales Road, Accent Drive and Ormiston Road directly support the requirements of Policies 1 and 3 of the NPS:UD for</p>

<p><b>Align corridors with density</b></p>	<p>development to facilitate modal shift, support commercial and mixed-use centres and contribute to vibrant, active urban environments.</p> <p><b>Active Mode Catchments</b></p> <p>Locate stations and interchange facilities in places that align with areas of greater density and is centred on the active mode catchment.</p>	<p>enabling increased development capacity adjacent to rapid transit networks. It is recommended that future design stages demonstrate the proposed modal connections, hierarchy, built form interfaces and arrangements that support the creation of vibrant, active urban environments</p>
<p><b>3.2</b></p> <p><b>Corridor scaled to the surrounding context and urban structure</b></p>	<p>Align the speed, type and scale of transport corridors and infrastructure with the environment that it moves through (appropriate scale to the context).</p> <p><b>Respond to Land Use</b></p> <p>The size, design and location of the facilities should respond to the adjacent land use and respect natural features. This minimises any 'left over' spaces and disconnected pockets of land that need integration.</p>	<ul style="list-style-type: none"> <li>• Approximately 2.1 km length of the NoR 1 existing corridor land uses that are currently Mixed Housing Suburban and Mixed Housing Urban are subject to change as a result of the increased development capacity requirements of the NPS:UD. This potential change of land use and residential density has the potential to alter the perceived scale and impact of the proposed corridor functions. Any potential conflict between placemaking aspirations within local communities and the scale and speed of the proposed movement functions of the corridor should be addressed in future design stages.</li> <li>• Key focus areas within NoR 1 that require further resolution in future design stages to demonstrate the potential scale and urban structure response include:             <ul style="list-style-type: none"> <li>– The walk-up catchments of the proposed stations at Smales Road, Accent Drive and Ormiston Road;</li> <li>– The corridor edges and interfaces with Business – Local Centre Zone, Business – Neighbourhood Centre Zone and Business – Town Centre Zone land; and</li> <li>– The built form interface, any visual or landscape buffers and development controls proposed for retained Business – Light Industry and Business – Mixed Use Zone land to the West of Te Irirangi Drive.</li> </ul> </li> </ul>
<p><b>3.3</b></p> <p><b>Facilitate an appropriate interface between place and movement</b></p>	<p>Facilitate the opportunity for place as well as movement in corridors (people-oriented streets)</p>	<ul style="list-style-type: none"> <li>• Key focus areas within NoR 1 that require further resolution in future design stages to demonstrate the place function include:             <ul style="list-style-type: none"> <li>– The service road environments that exist on both sides of full NoR 1 corridor (refer to Engineering drawings for locations);</li> <li>– The key intersections and mid-block crossings outlined under principle 2.4 – Social Cohesion;</li> </ul> </li> </ul>

		<ul style="list-style-type: none"> <li>– The built form interface, any visual or landscape buffers and development controls proposed for retained Business – Light Industry Zone and Business – Mixed Use Zone land to the west of Te Irirangi Drive.</li> </ul>
<b>MOVEMENT</b>		
<b>4.1</b> <b>Connect nodes</b>	Provide tangible connectivity between identified activity nodes. <b>Cross Corridor Connectivity</b> Balance the functional access requirements across the Project corridor with the optimal location to provide connections into the surrounding area.	<ul style="list-style-type: none"> <li>• There are opportunities in the future development of the Project to provide further clear and direct connections across the corridor between local, neighbourhood and town centre functions and the communities they serve. For example:                             <ul style="list-style-type: none"> <li>– Kellaway Drive / Brinlack Drive (upgrade existing underpass);</li> <li>– East Tamaki Road pedestrian crossing location (upgrade existing overpass);</li> <li>– Vidiri Court pedestrian crossing (Potential new crossing);</li> <li>– Whetstone Road pedestrian crossing (upgrade existing) overpass.</li> </ul> </li> <li>• There are opportunities in the future development of the Project to consider wider active mode network connections to:                             <ul style="list-style-type: none"> <li>– Greenmount Park via Kellaway Drive Reserve;</li> <li>– Ormiston Town Centre via Accent Drive; and</li> <li>– Fo Guang Shan Buddhist Temple via Accent Drive.</li> </ul> </li> </ul>
<b>4.2</b> <b>Connect modes</b>		Refer to Table 3 <b>Error! Reference source not found.</b> in relation to this design principle.
<b>4.3</b> <b>Support access to employment and industry</b>		Refer to Table 3 in relation to this design principle.
<b>4.4</b> <b>Prioritise active modes and public transport</b>		Refer to Table 3 in relation to this design principle.
<b>4.5</b> <b>Support inter-regional connections and strategic infrastructure</b>	Consider the location and alignment of significant movement corridors and placement of infrastructure (power, wastewater, water) to the network.	<ul style="list-style-type: none"> <li>• Te Irirangi Drive within NoR 1 is a key arterial corridor that connects existing industrial/commercial land use activities with the State Highway network. This corridor is currently classified as Level 1B in the Auckland Transport Freight Plan, which is described as roads of the highest strategic value to freight movement where efficient freight movements must be actively supported to maintain levels of service, where</li> </ul>

		<p>competing modes and land uses require active management.</p> <ul style="list-style-type: none"> <li>The potential conflict between the continued freight function of the corridor and placemaking opportunities arising from the introduction of the BRT stations along Te Irirangi Drive will require careful and deliberate consideration in future design stages of the project. Further urban design commentary on this issue is included under Principles 2.1, 2.4, 2.5, 3.1, 3.2, 3.3, 4.1 and 4.4.</li> </ul>
<b>4.6</b>	<b>Support legible corridor function</b>	Refer to Table 3 in relation to this design principle.
<b>LANDUSE</b>		
<b>5.1</b>	<b>Public transport directed and integrated into centres</b>	Refer to Table 3 in relation to this design principle.
<b>5.2</b>	<b>Strategic corridors as urban edges</b>	This principle is not directly relevant to the Project corridor.

## 1.2 NoR 2 Urban Design matters

Table 5: Urban design evaluation for NoR 2 – Rongomai Park to Puhinui Station

Principle	Explanation	Application to NoR 2
<b>ENVIRONMENT</b>		
<b>1.1 Support and enhance ecological corridors and biodiversity</b>	Mitigate the effects on or enhance existing ecological corridors through the placement and design of movement corridors	<ul style="list-style-type: none"> <li>Opportunities within the immediate environment of NoR 2 to support ecological connectivity and biodiversity are identified in the <i>Airport to Botany: Assessment of Ecological Effects</i> and include:                             <ul style="list-style-type: none"> <li>Artificial wetlands and swales within the corridor;</li> <li>Rongomai Park / Medvale Avenue Reserve; and</li> <li>Where the corridor crosses tributaries of the Puhinui, Otara Creek and Flat Bush catchments.</li> </ul> </li> </ul>
<b>1.2 Support water conservation and enhance water</b>	Take into account and work with the existing watershed as part of a whole system.	<ul style="list-style-type: none"> <li>The proposed typical corridor cross section and designation boundary allows spatial provisions where required to provide natural drainage to constructed stormwater ponds and raingardens to</li> </ul>

<p><b>quality in a watershed</b></p>		<p>address water quality and reduce hard engineering solutions. These locations are proposed at:</p> <ul style="list-style-type: none"> <li>– The eastern side of Te Irirangi Drive opposite Belinda Avenue;</li> <li>– The western side of Te Irirangi Drive Near Zelda Avenue;</li> <li>– The Manukau Sports Bowl site;</li> <li>– Hayman Park;</li> <li>– The corner of Lambie Drive and Puhinui Road;</li> <li>– The southern side of Puhinui Road near Plunket Avenue; and</li> <li>– Puhinui Creek.</li> </ul>
<p><b>1.3</b> <b>Minimise land disturbance, conserve resources and materials</b></p>		<p>Refer to Table 3 in relation to this design principle.</p>
<p><b>1.4</b> <b>Adapt to a changing climate and respond to the microclimatic factors of each area</b></p>		<p>Refer to Table 3 in relation to this design principle.</p>
<p><b>SOCIAL</b></p>		
<p><b>2.1</b> <b>Identity and place</b></p>	<p>The identity or spirit of place is generally acknowledged as the unique amalgam of the inherent built, natural and cultural qualities of a place. Responding to identity in the location and type of new corridors can provide a sense of continuity and contribute to our collective memory.</p> <p><b>Local Identity</b></p> <p>Locate the station facilities to maximise the placemaking potential and enhance local identity.</p>	<ul style="list-style-type: none"> <li>• The further identification, development and integration of key local community and identity drivers within NoR 2 should be addressed in future design stages. Key NoR 2 local identity locations and functions include:                     <ul style="list-style-type: none"> <li>– The Business – Local Centre Zone at Dawson Road;</li> <li>– Manukau Sports Bowl and Velodrome;</li> <li>– AUT South Campus (including addressing the objectives of the Manukau 2 Precinct);</li> <li>– Manukau Central (including addressing the objectives of the Manukau Precinct);</li> <li>– Manukau Station;</li> <li>– Manukau Institute of Technology; and</li> <li>– Hayman Park.</li> </ul> </li> <li>• Future design stages should demonstrate the project response to both the locational drivers outlined above and placemaking drivers including:                     <ul style="list-style-type: none"> <li>– Improved pedestrian and cyclist connectivity to the local and town centres outlined above;</li> <li>– Interface, modal priority and access arrangements at Hayman Park; and</li> </ul> </li> </ul>

		<ul style="list-style-type: none"> <li>– Interface, modal priority and access arrangements at the Manukau Sports Bowl and Velodrome.</li> </ul>
<b>2.2</b> <b>Respect culturally significant sites and landscapes</b>		Refer to Table 3 <b>Error! Reference source not found.</b> in relation to this design principle.
<b>2.3</b> <b>Adaptive corridors</b>	<p>Corridors should demonstrate flexibility to respond to changes in their function and physical interfaces. Consider an adaptive approach in the way strategic corridors are designed to be able to respond to changes in land use, the way we move around or utilise technology over time.</p> <p><b>Future Growth</b>                      Consider the existing and future movement and place context in the location of bus stations and transport interchange and the ability of the design to accommodate change over time.</p>	<ul style="list-style-type: none"> <li>• If practicable, future land integration post construction should be considered in the following areas to support any proposed development / redevelopment adjacent to the NoR 2 corridor:                             <ul style="list-style-type: none"> <li>– On both sides of Te Irirangi Drive between Otara Creek and SH1 crossing;</li> <li>– To the Business – Metropolitan Centre Zone land adjacent to the corridor on Ronwood Avenue, Davies Avenue, Manukau Station Road and Lambie Drive in Manukau City Centre;</li> <li>– To the Business – General Business Zone land adjacent to the corridor on Te Irirangi Drive and Great South Road; and</li> <li>– On both sides of Puhinui Road within NoR 2.</li> </ul> </li> </ul>
<b>2.4</b> <b>Social cohesion</b>	Provide clear, effective and legible connectivity between community and social functions.	<ul style="list-style-type: none"> <li>• The proposed corridor alignment and function can deliver a positive contribution to the sense of belonging and participation, as well as community resilience by supporting direct access to existing local, neighbourhood and town centres, schools, community functions and open spaces. Examples of school, community and business functions that will benefit from improved connectivity delivered by the Project within NoR 2 include:                             <ul style="list-style-type: none"> <li>– The Manukau Sports Bowl and Velodrome;</li> <li>– Redoubt North School (potential for direct access to the BRT station);</li> <li>– Puhinui School;</li> <li>– AUT South Campus (including addressing the objectives of the Manukau 2 Precinct);</li> <li>– Manukau Central (including addressing the objectives of the Manukau Precinct);</li> <li>– Manukau Station;</li> <li>– Manukau Institute of Technology; and</li> <li>– Hayman Park.</li> </ul> </li> </ul>

		<ul style="list-style-type: none"> <li>• To enable equitable local connectivity and cross corridor access to commercial centres and areas of current and future high density residential development, further development at the detailed design stage should be undertaken of crossing points for multi-lane intersections and potential midblock crossings including: <ul style="list-style-type: none"> <li>– A potential mid-block crossing of Te Irirangi Drive between Titchmarsh Crescent and Penion Drive;</li> <li>– Dawson Road;</li> <li>– Hollyford Road;</li> <li>– A potential mid-block crossing of Te Irirangi Drive at Leila Place;</li> <li>– Diorella Drive;</li> <li>– Te Irirangi Drive and Great South Road;</li> <li>– Great South Road at the entry to Southpoint Shopping centre;</li> <li>– Great South Road and Ronwood Avenue;</li> <li>– Two mid-block crossings (one an upgrade to existing) on Ronwood Avenue at the Westfield shopping centre;</li> <li>– Ronwood Avenue at Sharkey Way;</li> <li>– Ronwood Avenue and Davies Avenue;</li> <li>– Upgrade of the existing mid-block crossing on Davies Avenue;</li> <li>– Davies Avenue and Putney Way;</li> <li>– Davies Avenue and Manukau Station Road;</li> <li>– Manukau Station Road and Lambie Drive;</li> <li>– Lambie Drive and Ron wood Avenue;</li> <li>– Lambie Drive and Cavendish Drive;</li> <li>– Puhinui Road and Norman Spencer Drive;</li> <li>– Puhinui Road at Puhinui School; and</li> <li>– Puhinui Road and York Road / Grayson Avenue.</li> </ul> </li> </ul>
<p><b>2.5 Safety</b></p>	<p>Provide a safe and convenient network of routes accessible to people of all ages and abilities.</p> <p><b>Universal Access</b></p> <p>Focus on the needs of the customer by placing importance on the spatial requirements that provide for universally inclusive and safe facilities with good physical and visual links.</p>	<ul style="list-style-type: none"> <li>• Refer to Table 3 <b>Error! Reference source not found.</b> in relation to Safety recommendations. In addition to these recommendations, a CPTED audit of the NoR 2 project should address, at a minimum, the current identified CPTED risks including: <ul style="list-style-type: none"> <li>– Under bridge environments at the Otara Creek tributary overbridge and culverts;</li> <li>– The Orlando Park frontage;</li> <li>– The public access walkway from Te Irirangi Drive to Townley Place;</li> <li>– The corridor interfaces (both east and west) on Te Irirangi Drive adjacent to the SH1 over bridge;</li> </ul> </li> </ul>

		<ul style="list-style-type: none"> <li>- Hayman Park and it's interface with the Project corridor;</li> <li>- The public access walkway from Lambie Drive to Leith Court; and</li> <li>- The public access walkway from Puhinui Road to Fitzroy Street.</li> </ul>
<b>BUILT FORM</b>		
<p><b>3.1</b> <b>Align corridors with density</b></p>	<p>Locate stations/stops and corridors within walking distance of higher density development to facilitate modal shift, support commercial and mixed-use centres and contribute to vibrant, active urban environments.</p> <p><b>Active Mode Catchments</b> Locate stations and interchange facilities in places that align with areas of greater density and is centred on the active mode catchment.</p>	<ul style="list-style-type: none"> <li>• The proposed NoR 2 station locations at: <ul style="list-style-type: none"> <li>- Dawson Road;</li> <li>- Diorella Drive;</li> <li>- Ronwood Avenue (Manukau Central);</li> <li>- Manukau Station; and</li> <li>- Puhinui Road/Lambie Drive;</li> </ul> </li> <li>• Directly support the requirements of Policies 1 and 3 of the NPS:UD for enabling increased development capacity adjacent to rapid transit networks. It is recommended that future design stages demonstrate the proposed modal connections, hierarchy, built form interfaces and arrangements that support the creation of vibrant, active urban environments.</li> </ul>
<p><b>3.2</b> <b>Corridor scaled to the surrounding context and urban structure</b></p>	<p>Align the speed, type and scale of transport corridors and infrastructure with the environment that it moves through (appropriate scale to the context).</p> <p><b>Respond to Land Use</b> The size, design and location of the facilities should respond to the adjacent land use and respect natural features. This minimises any 'left over' spaces and disconnected pockets of land that need integration.</p>	<ul style="list-style-type: none"> <li>• Approximately 2.7 km length of the NoR 2 existing corridor land uses that are currently Residential – Single House Zone, Residential – Mixed Housing Suburban and Mixed Housing Urban are subject to change as a result of the increased development capacity requirements of the NPS:UD. This possible land use and residential density change has the potential to alter the perceived scale and impact of the proposed corridor functions. Any potential conflict between placemaking aspirations within local communities and the scale and speed of the proposed movement functions of the corridor should be addressed in future design stages.</li> <li>• Key focus areas within NoR 2 that require further resolution in future design stages to demonstrate the potential scale and urban structure response include: <ul style="list-style-type: none"> <li>- The walk-up catchments of the proposed stations within NoR 2;</li> <li>- The corridor edges and interfaces with Business – Local Centre Zone, Business Neighbourhood Centre Zone and Business – Town Centre Zone land;</li> <li>- The built form interface, any visual or landscape buffers and development controls proposed for retained Business – Light</li> </ul> </li> </ul>

		<p>Industry Zone and Business – Mixed Use Zone land to Lambie Drive.</p> <ul style="list-style-type: none"> <li>– Further vertical integration adjacent to bridging structures along the SH1 crossing should be developed at a detailed design stage to allow an appropriate transition and interface to adjacent built form.</li> </ul>
<p><b>3.3</b> <b>Facilitate an appropriate interface between place and movement</b></p>	<p>Facilitate the opportunity for place as well as movement in corridors (people-oriented streets)</p>	<ul style="list-style-type: none"> <li>• Key focus areas within NoR 2 that require further resolution in future design stages to demonstrate the place interface / response to the proposed movement functions include: <ul style="list-style-type: none"> <li>– The key community and business functions outlined for NoR 2 under Principle 2.4 Social Cohesion;</li> <li>– The key intersections and mid-block crossings outlined for NoR 2 under principle 2.4 – Social Cohesion;</li> <li>– Where Te Irirangi Drive approaches SH1 and retaining walls are potentially required; and</li> <li>– The built form interface, any visual or landscape buffers and development controls proposed for retained Business – Light Industry Zone, Business – General Business Zone and Business – Mixed Use Zone along Lambie Drive.</li> </ul> </li> </ul>
<p><b>MOVEMENT</b></p>		
<p><b>4.1</b> <b>Connect nodes</b></p>	<p>Provide tangible connectivity between identified activity nodes.</p> <p><b>Cross Corridor Connectivity</b></p> <p>Balance the functional access requirements across the Project corridor with the optimal location to provide connections into the surrounding area.</p>	<ul style="list-style-type: none"> <li>• There are opportunities in the future development of the Project to provide further clear and direct connections across the corridor between local, neighbourhood and town centre functions and the communities they serve. Examples of cross corridor connectivity that would benefit from further development in future design stages within NoR 2 include: <ul style="list-style-type: none"> <li>– Dawson Road local centre;</li> <li>– Diorella Drive at Redoubt North School and Manukau Sports Bowl and Velodrome;</li> <li>– Great South Road and Ronwood Avenue;</li> <li>– Two mid-block crossings (one an upgrade to existing) across Ronwood Avenue at the Westfield shopping centre;</li> <li>– Upgrade of the existing mid-block crossing on Davies Avenue to Hayward Park;</li> <li>– Davies Avenue and Putney Way (upgrade to existing);</li> <li>– Puhinui Road and Norman Spencer Drive;</li> <li>– Puhinui Road at Puhinui School; and</li> </ul> </li> </ul>

		<ul style="list-style-type: none"> <li>– Puhinui Road and York Road / Grayson Avenue.</li> <li>• There are opportunities in the future development of the Project to consider wider active mode network connections to;                             <ul style="list-style-type: none"> <li>– Puhinui Creek via Lambie Drive; and</li> <li>– Hayman Park and Manukau Station via Puhinui Creek.</li> </ul> </li> </ul>
<b>4.2</b> <b>Connect modes</b>		The station location and layout within the Manukau precinct should consider legibility and clear wayfinding for all modes between the BRT station, rail station and bus interchange. Further development of the functional layout of the precinct is recommended.
<b>4.3</b> <b>Support access to employment and industry</b>		Refer to Table 3 in relation to this design principle.
<b>4.4</b> <b>Prioritise active modes and public transport</b>		Refer to Table 3 in relation to this design principle.
<b>4.5</b> <b>Support inter-regional connections and strategic infrastructure</b>	Consider the location and alignment of significant movement corridors and placement of infrastructure (power, wastewater, water) to the network.	<ul style="list-style-type: none"> <li>• Te Irirangi Drive within NoR 2 is a key arterial corridor that connects existing industrial/commercial land use activities with the State Highway network. This corridor is currently classified as Level 1B in the Auckland Transport Freight Plan, which is described as roads of the highest strategic value to freight movement where efficient freight movements must be actively supported to maintain levels of service, where competing modes and land uses require active management. Future downgrade of the freight classification is envisaged for this corridor.</li> <li>• Any other potential conflict between the continued freight function of the corridor and placemaking opportunities arising from the introduction of the BRT function along Te Irirangi Drive will require careful and deliberate consideration in future design stages of the project. Further urban design commentary on this issue is included under Principles 2.1, 2.4, 2.5, 3.1, 3.2, 3.3, 4.1 and 4.4.</li> </ul>
<b>4.6</b> <b>Support legible corridor function</b>		Refer to Table 3 in relation to this design principle.
<b>LANDUSE</b>		
<b>5.1</b>		Refer to Table 3 in relation to this design principle.

<b>Public transport directed and integrated into centres</b>		
<b>5.2 Strategic corridors as urban edges</b>		This principle is not directly relevant to the Project corridor.

### 1.3 NoR 3 Urban Design matters

Table 6: Urban design evaluation for NoR 3 – Puhinui Station to SH20/20B Interchange

Principle	Explanation	Application to NoR 3
<b>ENVIRONMENT</b>		
<b>1.1 Support and enhance ecological corridors and biodiversity</b>	Mitigate the effects on or enhance existing ecological corridors through the placement and design of movement corridors	The existing environment within NoR 3 presents limited opportunities to support ecological connectivity and biodiversity. The corridor passes through a highly urbanised area which is predominantly residential comprising amenity planting and gardens.
<b>1.2 Support water conservation and enhance water quality in a watershed</b>		Refer to Table 3 in relation to this design principle.
<b>1.3 Minimise land disturbance, conserve resources and materials</b>		Refer to Table 3 in relation to this design principle.
<b>1.4 Adapt to a changing climate and respond to the microclimatic factors of each area</b>		Refer to Table 3 in relation to this design principle.
<b>SOCIAL</b>		
<b>2.1 Identity and place</b>	The identity or spirit of place is generally acknowledged as the unique amalgam of the inherent built, natural and cultural qualities of a place. Responding to identity in the location and type of new corridors can provide a sense of continuity and	<ul style="list-style-type: none"> <li>• The further identification, development and integration of key local community and identity drivers within NoR 3 should be addressed in future design stages. Key NoR 3 local identity locations and functions include:                             <ul style="list-style-type: none"> <li>– The Business – Neighbourhood Centre Zone at Wyllie Road and Noel Burnside Road;</li> <li>– The Puhinui Station area that includes Te Kohanga Reo ki Puhinui; and</li> </ul> </li> </ul>

	<p>contribute to our collective memory.</p> <p><b>Local Identity</b></p> <p>Locate the station facilities to maximise the placemaking potential and enhance local identity.</p>	<ul style="list-style-type: none"> <li>- The Business – Neighbourhood Centre Zone at Ranfurly Road.</li> <li>• Future design stages should demonstrate the project response to local identity drivers including:             <ul style="list-style-type: none"> <li>- The built form, corridor interface, modal priority and access response to the proposed BRT and rail station interchange and the area adjacent to Puhinui Station; and</li> <li>- Improved pedestrian and cyclist connectivity to the local and neighbourhood centres outlined above.</li> </ul> </li> </ul>
<p><b>2.2</b></p> <p><b>Respect culturally significant sites and landscapes</b></p>	<p>Acknowledge significant sites and features in the layout of movement corridors including ridgelines or horizons.</p>	<ul style="list-style-type: none"> <li>• There is one Category B Scheduled historic heritage place (250 Puhinui Road Cambria House and Gardeners Cottage) recorded in close proximity to the proposed NoR 3 corridor – this site provides an opportunity for future development to explore and celebrate the inherent heritage character drivers of the area.</li> <li>• There is also a memorial plaque identified at the intersection of Kenderdine Road and Puhinui Road with some historical value that should be recognised and considered in future placemaking opportunities.</li> <li>• Further details of these are referenced in the <i>Airport to Botany: Assessment of Historic Heritage Effects</i>.</li> </ul>
<p><b>2.3</b></p> <p><b>Adaptive corridors</b></p>	<p>Corridors should demonstrate flexibility to respond to changes in their function and physical interfaces. Consider an adaptive approach in the way strategic corridors are designed to be able to respond to changes in land use, the way we move around or utilise technology over time.</p> <p><b>Future Growth</b></p> <p>Consider the existing and future movement and place context in the location of a rail station and transport interchange and the ability of the design to accommodate change over time.</p>	<ul style="list-style-type: none"> <li>• If practicable, future land integration post construction should be considered in the following areas to support any proposed development / redevelopment adjacent to the NoR 3 corridor:             <ul style="list-style-type: none"> <li>- On both sides of Puhinui Road within NoR 3; and</li> <li>- The Puhinui Station area.</li> </ul> </li> </ul>

<p><b>2.4</b> <b>Social cohesion</b></p>	<p>Provide clear, effective and legible connectivity between community and social functions.</p>	<ul style="list-style-type: none"> <li>• To enable equitable local connectivity and cross corridor access to commercial centres and areas of high density, further development at the detailed design stage should be undertaken of crossing points for multi-lane intersections and potential midblock crossings including: <ul style="list-style-type: none"> <li>– Plunket Avenue;</li> <li>– The Puhinui Station area including intersections at Kenderdine Road, Cambridge Terrace and Clendon Avenue;</li> <li>– An integrated crossing at the intersections of Wyllie Road and Noel Burnside Road.</li> </ul> </li> <li>• The proposed corridor alignment and function can deliver a positive contribution to the sense of belonging and participation, as well as community resilience by supporting direct access to existing local, neighbourhood and town centres, schools, community functions and open spaces. Examples of school, community and business functions that will benefit from improved connectivity delivered by the Project within NoR 2 include: <ul style="list-style-type: none"> <li>– Puhinui School;</li> <li>– Greyson Avenue Reserve;</li> <li>– Puhinui Rail Station precinct;</li> <li>– Te Kohanga Reo ki Puhinui;</li> <li>– Papatoetoe South School; and</li> <li>– Murdoch Park.</li> </ul> </li> </ul>
<p><b>2.5</b> <b>Safety</b></p>	<p>Provide a safe and convenient network of routes accessible to people of all ages and abilities.</p> <p><b>Universal Access</b></p> <p>Focus on the needs of the customer by placing importance on the spatial requirements that provide for universally inclusive and safe facilities with good physical and visual links.</p>	<ul style="list-style-type: none"> <li>• Refer to Table 3 in relation to Safety recommendations. In addition to these recommendations, a CPTED audit of the NoR 3 project should address, at a minimum, the current identified CPTED risks including: <ul style="list-style-type: none"> <li>– The Business – Neighbourhood Centre Zone at Wyllie Road and Noel Burnside Road;</li> <li>– The Puhinui Station precinct that includes Te Kohanga Reo ki Puhinui; and</li> <li>– The Neighbourhood Centre Zone at Ranfurly Road.</li> </ul> </li> </ul>
<p><b>BUILT FORM</b></p>		
<p><b>3.1</b> <b>Align corridors with density</b></p>	<p>Locate stations/stops and corridors within walking distance of higher density development to facilitate modal shift, support commercial and mixed-use centres and contribute to</p>	<ul style="list-style-type: none"> <li>• The proposed NoR 3 station location at the existing Puhinui Station directly supports the requirements of Policies 1 and 3 of the NPS:UD for enabling increased development capacity adjacent to rapid transit networks. It is recommended that future design stages demonstrate the proposed modal connections, hierarchy, built form interfaces and</li> </ul>

	<p>vibrant, active urban environments.</p> <p><b>Active Mode Catchments</b></p> <p>Locate stations and interchange facilities in places that align with areas of greater density and is centred on the active mode catchment.</p>	<p>arrangements that support the creation of vibrant, active urban environments.</p>
<p><b>3.2</b></p> <p><b>Corridor scaled to the surrounding context and urban structure</b></p>	<p>Align the speed, type and scale of transport corridors and infrastructure with the environment that it moves through (appropriate scale to the context).</p> <p><b>Respond to Land Use</b></p> <p>The size, design and location of the facilities should respond to the adjacent land use and respect natural features. This minimises any 'left over' spaces and disconnected pockets of land that need integration.</p>	<ul style="list-style-type: none"> <li>• The full length of the NoR 3 existing corridor land uses that are currently Residential – Mixed Housing Suburban Zone and Residential – Mixed Housing Urban Zone are subject to change as a result of the increased development capacity requirements of the NPS:UD. This potential change of land use and residential density has the potential to alter the perceived scale and impact of the proposed corridor functions. Any potential conflict between placemaking aspirations within local communities and the scale and speed of the proposed movement functions of the corridor should be addressed in future design stages.</li> <li>• Key focus areas within NoR 3 that require further resolution in future design stages to demonstrate the potential scale and urban structure response include: <ul style="list-style-type: none"> <li>– The walk-up catchment of the proposed BRT station at the existing Puhinui Station;</li> <li>– The corridor edges and interfaces with the Business – Neighbourhood Zone land;</li> <li>– The built form interface, any visual or landscape buffers and development controls proposed for retained Business – Light Industry Zone and Business – Mixed Use Zone land to the south of Puhinui Road.</li> </ul> </li> <li>• Future design detail of the proposed BRT bridge structure at Puhinui station should consider scale, visual integration, interface and sense of place qualities to the rail station building and other adjacent developments.</li> <li>• Further vertical integration adjacent to the BRT bridge structure should be developed at a detailed design stage to allow an appropriate transition and interface to adjacent built form.</li> </ul>
<p><b>3.3</b></p> <p><b>Facilitate an appropriate interface between place and movement</b></p>	<p>Facilitate the opportunity for place as well as movement in corridors (people-oriented streets)</p>	<ul style="list-style-type: none"> <li>• Key focus areas within NoR 3 that require further resolution in future design stages to demonstrate the place function include:</li> </ul>

		<ul style="list-style-type: none"> <li>– The key intersections and mid-block crossings outlined under principle 2.4 – Social Cohesion;</li> <li>– The built form interface, any visual or landscape buffers and development controls proposed for retained Business – Light Industry Zone and Business – Mixed Use Zone land to the south of Puhinui Road.</li> </ul>
<b>MOVEMENT</b>		
<b>4.1</b> <b>Connect nodes</b>	Provide tangible connectivity between identified activity nodes. <b>Cross Corridor Connectivity</b> Balance the functional access requirements across the Project corridor with the optimal location to provide connections into the surrounding area.	<ul style="list-style-type: none"> <li>• There are opportunities in the future development of the Project to provide further clear and direct connections across the corridor between neighbourhood centre functions and the communities they serve. For example:                             <ul style="list-style-type: none"> <li>– The Business – Neighbourhood Centre Zone at Wyllie Road and Noel Burnside Road;</li> <li>– The Puhinui Station area that includes Te Kohanga Reo ki Puhinui; and</li> <li>– The Business – Neighbourhood Centre Zone at Ranfurly Road.</li> </ul> </li> <li>• Future active mode opportunities to connect to Old Papatoetoe town centre.</li> </ul>
<b>4.2</b> <b>Connect modes</b>		<ul style="list-style-type: none"> <li>• Further development of the functional layout of the Puhinui station area is recommended to provide for legibility and clear wayfinding for active modes through and around the station area and between the rail and BRT station.</li> </ul>
<b>4.3</b> <b>Support access to employment and industry</b>		Refer to Table 3 in relation to this design principle.
<b>4.4</b> <b>Prioritise active modes and public transport</b>	Provision of quality active mode corridors and dedicated public transport corridors to enable a modal shift away from private vehicle use. <b>Walkability</b> Locate the station and interchange facility within or in close proximity and walking distance of local activity hubs/town centres. <b>Modal Priority</b>	Potential priority conflicts between active modes / public transport and the ongoing freight function of Puhinui Road should be further identified and addressed in future design states of the project.

	<p>Consider efficient connectivity between transport modes by:</p> <ul style="list-style-type: none"> <li>• Providing access that is aligned with the desired modal hierarchy; 1) pedestrians, 2) cyclists/micro-mobility, 3) public transport, 4) drop off/pick up/taxis, and 5) private vehicles / parking.</li> <li>• Minimising the interchange time and distance between transport modes by designing direct, safe and self-explaining linkages.</li> <li>• Minimising the conflicts between modes.</li> </ul>	
<b>4.5</b> <b>Support inter-regional connections and strategic infrastructure</b>		Refer to Table 3 in relation to this design principle.
<b>4.6</b> <b>Support legible corridor function</b>		Refer to Table 3 in relation to this design principle.
<b>LANDUSE</b>		
<b>5.1</b> <b>Public transport directed and integrated into centres</b>	Locate rapid transit interchanges within centres (local, town and metro) to support a mix of uses and provide modal choice to a larger number of users.	Refer to Table 3 in relation to this design principle.
<b>5.2</b> <b>Strategic corridors as urban edges</b>		This principle is not directly relevant to the Project corridor.

## 1.4 NoRs 4a and 4b Urban Design matters

Table 7: Urban design evaluation for NoRs 4a and 4b – SH20/20B Interchange to Orrs Road

Principle	Explanation	Application to NoRs 4a and 4b
<b>ENVIRONMENT</b>		

<b>1.1 Support and enhance ecological corridors and biodiversity</b>	Mitigate the effects on or enhance existing ecological corridors through the placement and design of movement corridors	<ul style="list-style-type: none"> <li>Opportunities within the immediate environment of NoR 4a and 4b to support ecological connectivity and biodiversity are identified in the <i>Airport to Botany: Assessment of Ecological Effects</i> and include:                         <ul style="list-style-type: none"> <li>Artificial vegetated swales within the corridor; and</li> <li>where the corridor crosses tributaries of Waokauri Creek and its tributaries.</li> </ul> </li> <li>There is one water course bridge crossing in NoR 4a at Waokauri Creek (ch2050) that presents an opportunity to reinforce broader connectivity outcomes for ecology and water quality by minimising the stream interruption and ensuring a connected natural system.</li> </ul>
<b>1.2 Support water conservation and enhance water quality in a watershed</b>	Take into account and work with the existing watershed as part of a whole system.	The proposed typical corridor cross section and designation boundary allows spatial provisions to provide natural drainage to vegetated swales to address water quality and reduce hard engineering solutions.
<b>1.3 Minimise land disturbance, conserve resources and materials</b>		Refer to Table 3 in relation to this design principle.
<b>1.4 Adapt to a changing climate and respond to the microclimatic factors of each area</b>		Refer to Table 3 in relation to this design principle.
<b>SOCIAL</b>		
<b>2.1 Identity and place</b>	The identity or spirit of place is generally acknowledged as the unique amalgam of the inherent built, natural and cultural qualities of a place. Responding to identity in the location and type of new corridors can provide a sense of continuity and contribute to our collective memory.  <b>Local Identity</b> Locate the station facilities to maximise the placemaking potential and enhance local identity.	<ul style="list-style-type: none"> <li>The further identification, development and integration of key identity drivers within NoRs 4a and 4b should be addressed in future design stages and are generally limited to the Manukau Memorial Gardens frontage and entry.</li> <li>With the exception of the Manukau Memorial Gardens, the existing setting of the corridor is expected to change significantly with the realisation of the Business – Light Industry Zone land to the south of the corridor and the Future Urban Zone around Campana Road.</li> </ul>

<p><b>2.2</b> <b>Respect culturally significant sites and landscapes</b></p>	<p>Acknowledge significant sites and features in the layout of movement corridors including ridgelines or horizons.</p>	<ul style="list-style-type: none"> <li>As set in the Puhinui Precinct of the AUP:OP and summarised in the AEE, the Puhinui peninsula is of significant cultural value to Manawhenua, in particular Te Ākitai Waiohū.</li> <li>Key areas of interest for Te Ākitai Waiohū which were identified in the Cultural Values Assessment prepared for the previous business case phase of the Project include: Pūkaki and Waokauri Creeks, the Pūkaki marae on the northern bank of the Waokauri Creek; several recorded archaeological sites and evidence of widespread occupation in the area by Manawhenua during pre-European times, volcanic cones and other significant sites relating to historic settlements and the Manukau Harbour.</li> <li>To recognise the connection Te Ākitai Waiohū and other Manawhenua have to the Project area, it is recommended that Manawhenua are invited as partners in all phases of the Project to provide input on the cultural, landscape and design matters including how Project outcomes reflect their identity and values.</li> <li>Refer to Table 3 <b>Error! Reference source not found.</b> in relation to this design principle.</li> </ul>
<p><b>2.3</b> <b>Adaptive corridors</b></p>		<p>Refer to Table 3 in relation to this design principle.</p>
<p><b>2.4</b> <b>Social cohesion</b></p>		<p>Refer to Table 3 in relation to this design principle.</p>
<p><b>2.5</b> <b>Safety</b></p>	<p>Provide a safe and convenient network of routes accessible to people of all ages and abilities.</p> <p><b>Universal Access</b></p> <p>Focus on the needs of the customer by placing importance on the spatial requirements that provide for universally inclusive and safe facilities with good physical and visual links.</p>	<ul style="list-style-type: none"> <li>Refer to Table 3 in relation to Safety recommendations. In addition to these recommendations, a CPTED audit of the corridor within NoRs 4a and 4b should address, at a minimum, the current identified CPTED risks including:                     <ul style="list-style-type: none"> <li>The walking and cycling facilities where there are limited passive surveillance opportunities; and</li> <li>The underbridge environment at the Waokauri Creek overbridge.</li> </ul> </li> </ul>
<p><b>BUILT FORM</b></p>		
<p><b>3.1</b> <b>Align corridors with density</b></p>		<ul style="list-style-type: none"> <li>This principle is not directly relevant to the NoR 4 corridor as the area is predominantly zoned Business – Light Industry Zone and Future Urban Zone.</li> </ul>
<p><b>3.2</b> <b>Corridor scaled to the surrounding</b></p>		<ul style="list-style-type: none"> <li>Future design detail of the proposed ramp structure from SH20B to SH20 should consider scale, visual integration and interface response to adjacent land use functions.</li> </ul>

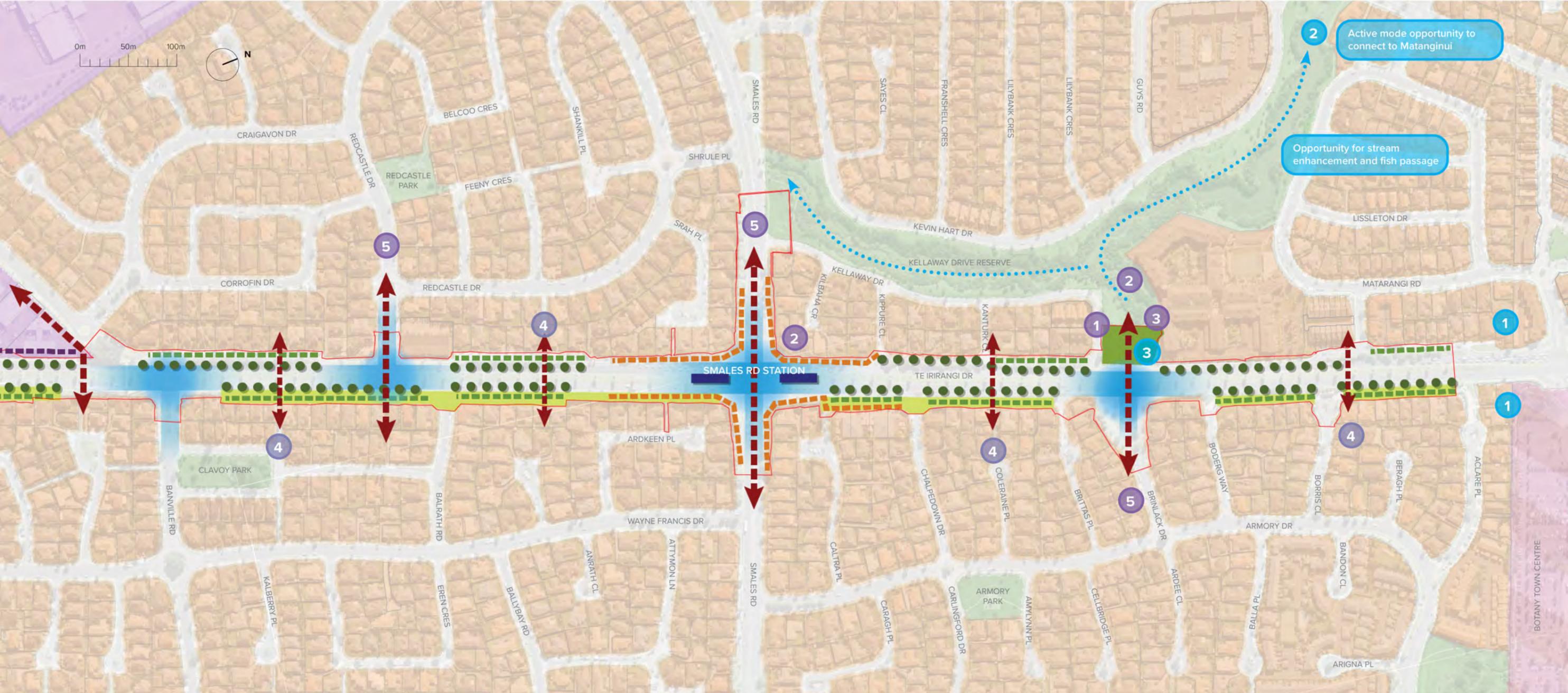
<b>context and urban structure</b>		<ul style="list-style-type: none"> <li>Further vertical integration adjacent to the proposed ramp structure should be developed at a detailed design stage to allow an appropriate transition and interface to adjacent built form.</li> </ul>
<b>3.3 Facilitate an appropriate interface between place and movement</b>	Facilitate the opportunity for place as well as movement in corridors (people-oriented streets)	<ul style="list-style-type: none"> <li>Key focus areas within NoRs 4a and 4b that require further resolution in future design stages to demonstrate the place function include the built form interface, any visual or landscape buffers and development controls proposed for retained Business – Light Industry Zone lands to the south of Puhinui Road.</li> </ul>
<b>MOVEMENT</b>		
<b>4.1 Connect nodes</b>		<ul style="list-style-type: none"> <li>There are opportunities in the future development of the Project to provide clear and direct connections across the corridor to the Manukau Memorial Gardens.</li> </ul>
<b>4.2 Connect modes</b>		Refer to Table 3 in relation to this design principle.
<b>4.3 Support access to employment and industry</b>		Refer to Table 3 in relation to this design principle.
<b>4.4 Prioritise active modes and public transport</b>	Provision of quality active mode corridors and dedicated public transport corridors to enable a modal shift away from private vehicle use. <b>Walkability</b> Locate the station and interchange facility within or in close proximity and walking distance of local activity hubs/town centres.  <b>Modal Priority</b> Consider efficient connectivity between transport modes by:	Refer to Table 3 in relation to this design principle.
<ul style="list-style-type: none"> <li>Providing access that is aligned with the desired modal hierarchy; 1) pedestrians, 2) cyclists/micro-mobility, 3) public transport, 4) drop off/pick up/taxis, and 5) private vehicles / parking.</li> </ul>		

	<ul style="list-style-type: none"> <li>• Minimising the interchange time and distance between transport modes by designing direct, safe and self-explaining linkages.</li> <li>• Minimising the conflicts between modes.</li> </ul>	
<p><b>4.5</b> Support inter-regional connections and strategic infrastructure</p>	<p>Consider the location and alignment of significant movement corridors and placement of infrastructure (power, wastewater, water) to the network.</p>	<ul style="list-style-type: none"> <li>• SH20A and SH20B, alongside SH20 between Manukau and the SH20A intersection, are areas of high heavy commercial vehicle (HCV) use. Auckland Airport, Wiri / Manukau and their surrounds are international gateways and major freight generators and attractors. Airport access for freight is heavily reliant on the SH20A/B triangle.</li> <li>• The proposed ramp structure from SH20B to SH20 will provide a direct and strategic connection to SH20 which is an important link for HCVs that travel from the industrial area in Onehunga/Penrose to Wiri/Manukau (and vice versa).</li> <li>• Puhinui Road within NoRs 4a and 4b is a key arterial corridor that connects existing industrial/commercial land use activities with the State Highway network. This corridor is currently classified as Level 1A in the Auckland Transport Freight Plan, which is described as roads of the highest strategic value to freight movement, including the motorways and most of the state highways (typically the Waka Kotahi road network), being arterials where efficient freight movements must be actively supported to maintain Levels of Service through active planning and design</li> <li>• The potential conflict between the continued freight function of the corridor and placemaking opportunities arising from the introduction of the BRT function along Puhinui Road will require careful and deliberate consideration in future design stages of the project. Further urban design commentary on this issue is included under Principles 2.1, 2.4, 2.5, 3.1, 3.2, 3.3, 4.1 and 4.4.</li> </ul>
<p><b>4.6</b> Support legible corridor function</p>		<p>Refer to Table 3 in relation to this design principle.</p>
<p><b>LANDUSE</b></p>		
<p><b>5.1</b> Public transport directed and</p>		<p>Refer to Table 3 in relation to this design principle.</p>

<p><b>integrated into centres</b></p>		
<p><b>5.2 Strategic corridors as urban edges</b></p>		<p>This principle is not directly relevant to the Project corridor.</p>

# Appendix B

Urban design outcomes and opportunities for the Project



## NOR 1 - BOTANY TOWN CENTRE TO RONGOMAI PARK

- Outcomes
- Opportunities
- 1 **Ecological connectivity** - Landscape outcomes should reinforce the wider vegetation patterns of the local open spaces and support ecological connectivity and biodiversity in the local environment.
- 2 **Identity drivers** - Key local community, landscape and identity drivers should be identified, developed and integrated with the adjacent land use functions and future design response.
- 3 **CPTED** - Future design should incorporate CPTED principles including clear sightlines, good levels of lighting and passive surveillance.
- 4 **Active mode permeability** - Corridor permeability for active modes that addresses cross corridor connectivity (midblock crossings), modal priority and permeable access to destinations such as centres, transport interchanges, open spaces and community facilities.

- 5 **Active mode legibility and priority** - Legibility, connectivity demands, safety and modal priority for active modes should be addressed at intersections.
- 6 **Bridges** - Consideration of visual integration, interface and sense of place for bridge structure.
- 1 **Residual land** - Opportunity to demonstrate how any residual land portions following the construction of the Project are redefined and integrated with the expected future land use function.
- 2 **Wider connectivity** - Opportunity to reinforce connections to the wider community and landscape features.
- 3 **Enhancement** - Opportunity for ecological enhancement and tree planting

## OUTCOMES AND OPPORTUNITIES PLAN - SHEET 01 OF 03

### OUTCOMES

- Stormwater management outcomes should demonstrate integration of the stormwater raingardens and wetlands within the corridor and ensure an appropriate interface with adjacent land uses.
- High density residential and mixed-use integration / interface that enables buildings and spaces to positively address and integrate with the corridor.
- Intersection arrangement that addresses multi-modal priority, safety and legibility.
- ↔ Cross corridor active mode connection.
- Landscape outcomes should provide replace and augment canopy shading to the corridor. Outcomes to reflect and enhance the local character inherent in the built, natural and cultural qualities of the location within the corridor.
- Interface and visual / landscape buffer considerations for retained industrial, business and mixed use zones
- Integrated lane for stormwater treatments and walking and cycling facilities

### LEGEND

- Designation Boundary
- Residential - THAB
- Business - Light Industry Zone
- Business - Future Centre Zone
- Business - Metropolitan Centre Zone
- Business - General Business Zone
- Mixed Use
- Public Open Space
- Proposed Bus Rapid Transit Stop
- Train Station
- - - School



## NOR 1 - BOTANY TOWN CENTRE TO RONGOMAI PARK

- |   |   |  |
|---|---|--|
| <ul style="list-style-type: none"> <li><span style="color: purple;">●</span> Outcomes</li> <li><span style="color: blue;">●</span> Opportunities</li> </ul> | <ul style="list-style-type: none"> <li><span style="color: purple;">1</span> <b>Ecological connectivity</b> - Landscape outcomes should reinforce the wider vegetation patterns of the local open spaces and support ecological connectivity and biodiversity in the local environment.</li> <li><span style="color: purple;">2</span> <b>Identity drivers</b> - Key local community, landscape and identity drivers should be identified, developed and integrated with the adjacent land use functions and future design response.</li> <li><span style="color: purple;">3</span> <b>CPTED</b> - Future design should incorporate CPTED principles including clear sightlines, good levels of lighting and passive surveillance.</li> <li><span style="color: purple;">4</span> <b>Active mode permeability</b> - Corridor permeability for active modes that addresses cross corridor connectivity (midblock crossings), modal priority and permeable access to destinations such as centres, transport interchanges, open spaces and community facilities.</li> </ul> | <ul style="list-style-type: none"> <li><span style="color: purple;">5</span> <b>Active mode legibility and priority</b> - Legibility, connectivity demands, safety and modal priority for active modes should be addressed at intersections.</li> <li><span style="color: purple;">6</span> <b>Bridges</b> - Consideration of visual integration, interface and sense of place for bridge structure.</li> <li><span style="color: blue;">1</span> <b>Residual land</b> - Opportunity to demonstrate how any residual land portions following the construction of the Project are redefined and integrated with the expected future land use function.</li> <li><span style="color: blue;">2</span> <b>Wider connectivity</b> - Opportunity to reinforce connections to the wider community and landscape features.</li> <li><span style="color: blue;">3</span> <b>Enhancement</b> - Opportunity for ecological enhancement and tree planting</li> </ul> |
|---|---|--|

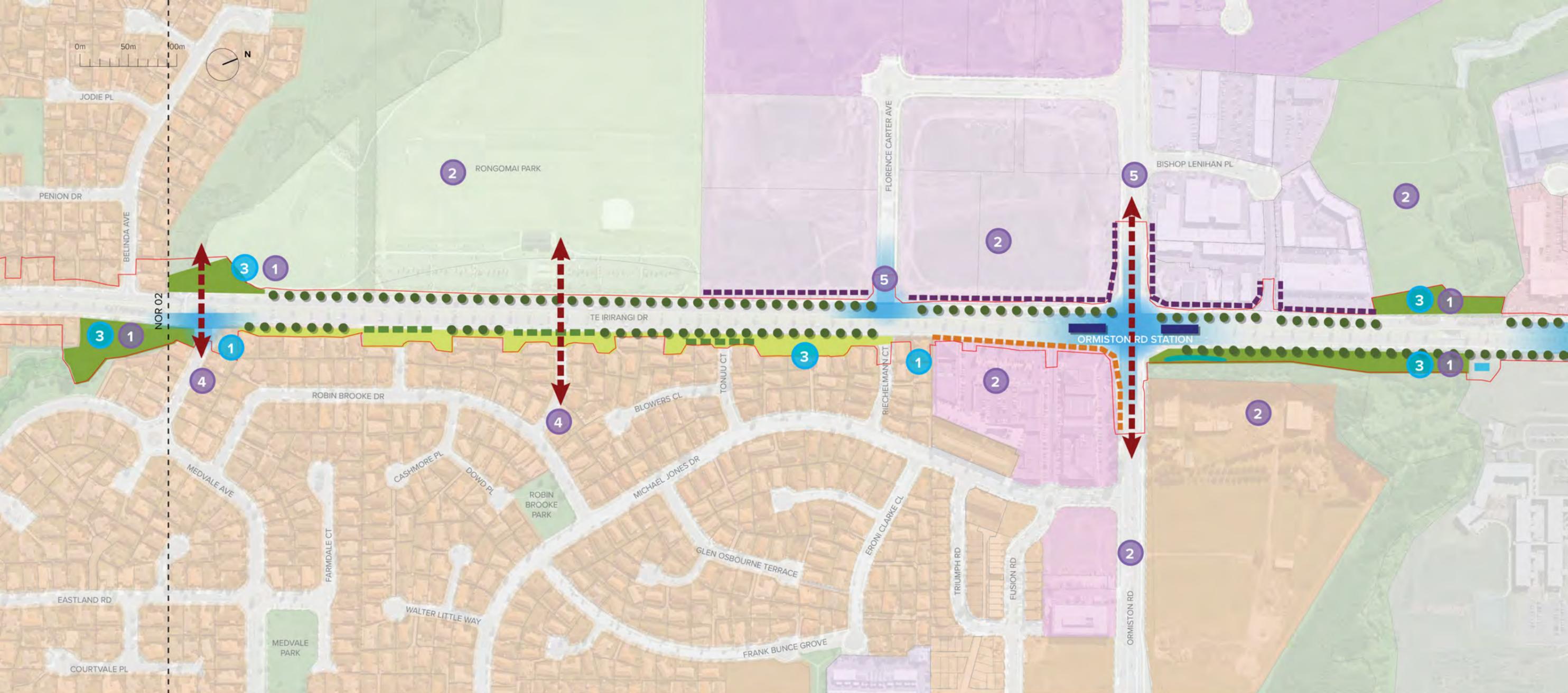
## OUTCOMES AND OPPORTUNITIES PLAN - SHEET 02 OF 03

### OUTCOMES

- Stormwater management outcomes should demonstrate integration of the stormwater raingardens and wetlands within the corridor and ensure an appropriate interface with adjacent land uses.
- High density residential and mixed-use integration / interface that enables buildings and spaces to positively address and integrate with the corridor.
- Intersection arrangement that addresses multi-modal priority, safety and legibility.
- ↔ Cross corridor active mode connection.
- Landscape outcomes should provide replace and augment canopy shading to the corridor. Outcomes to reflect and enhance the local character inherent in the built, natural and cultural qualities of the location within the corridor.
- Interface and visual / landscape buffer considerations for retained industrial, business and mixed use zones
- Integrated lane for stormwater treatments and walking and cycling facilities

### LEGEND

- Designation Boundary
- Residential - THAB
- Business - Light Industry Zone
- Business - Future Centre Zone
- Business - Metropolitan Centre Zone
- Business - General Business Zone
- Mixed Use
- Public Open Space
- Proposed Bus Rapid Transit Stop
- Train Station
- - - School
- Proposed Stormwater Pond



## NOR 1 - BOTANY TOWN CENTRE TO RONGOMAI PARK

● Outcomes
 ● Opportunities

- 1 **Ecological connectivity** - Landscape outcomes should reinforce the wider vegetation patterns of the local open spaces and support ecological connectivity and biodiversity in the local environment.
- 2 **Identity drivers** - Key local community, landscape and identity drivers should be identified, developed and integrated with the adjacent land use functions and future design response.
- 3 **CPTED** - Future design should incorporate CPTED principles including clear sightlines, good levels of lighting and passive surveillance.
- 4 **Active mode permeability** - Corridor permeability for active modes that addresses cross corridor connectivity (midblock crossings), modal priority and permeable access to destinations such as centres, transport interchanges, open spaces and community facilities.
- 5 **Active mode legibility and priority** - Legibility, connectivity demands, safety and modal priority for active modes should be addressed at intersections.
- 6 **Bridges** - Consideration of visual integration, interface and sense of place for bridge structure.
- 1 **Residual land** - Opportunity to demonstrate how any residual land portions following the construction of the Project are redefined and integrated with the expected future land use function.
- 2 **Wider connectivity** - Opportunity to reinforce connections to the wider community and landscape features.
- 3 **Enhancement** - Opportunity for ecological enhancement and tree planting

## OUTCOMES AND OPPORTUNITIES PLAN - SHEET 03 OF 03

### OUTCOMES

- Stormwater management outcomes should demonstrate integration of the stormwater raingardens and wetlands within the corridor and ensure an appropriate interface with adjacent land uses.
- High density residential and mixed-use integration / interface that enables buildings and spaces to positively address and integrate with the corridor.
- Intersection arrangement that addresses multi-modal priority, safety and legibility.
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