



PAPAKURA TO PUKEKURA

Urban and Landscape Design Framework

June 2021



PAPAKURA TO PUKEKURA ULDF

Prepared for: Waka Kotahi
Date: June 2021

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Revision Schedule

Revision	Date	Prepared by	Reviewers
A	November, 2019	M McBain	S Bray
B	February, 2020	M McBain	S Bray
C	August, 2020	M McBain	S Bray
D	September, 2020	M McBain	S Bray
E	November, 2020	M McBain	J Hunt, S Bray
F	June, 2021	S Bray	H McLean



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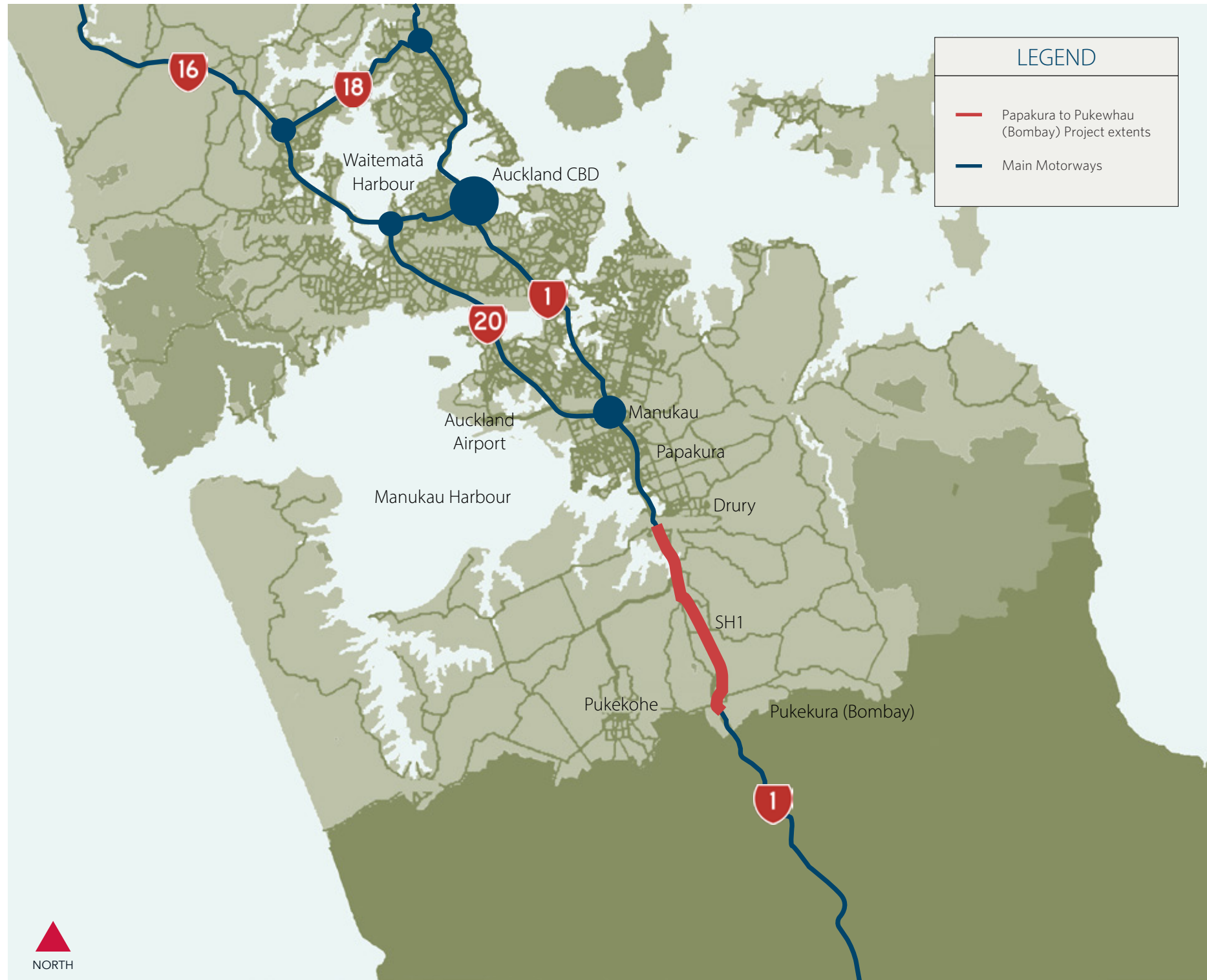


SECTION A: PROJECT OVERVIEW



- A1 INTRODUCTION
- A2 URBAN AND LANDSCAPE DESIGN FRAMEWORK
- A3 MATAURANGA MĀORI
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A1: INTRODUCTION



Not to Scale

INTRODUCTION

Welcome to the Papakura to Pukekura (P2P) Urban and Landscape Design Framework (ULDF), prepared for Waka Kotahi (NZTA).

P2P is one of the early projects from the Supporting Growth programme and the Auckland Transport Alignment Project 2018.

This framework has been developed to inform ongoing urban design and landscape development and ensure consistency of outcomes across the whole project area.

Waka Kotahi are simultaneously working with Auckland Transport (AT) and Auckland Council to explore walking and cycling networks and facilities, including the provision of a new Shared Use Path alongside motorway corridors.

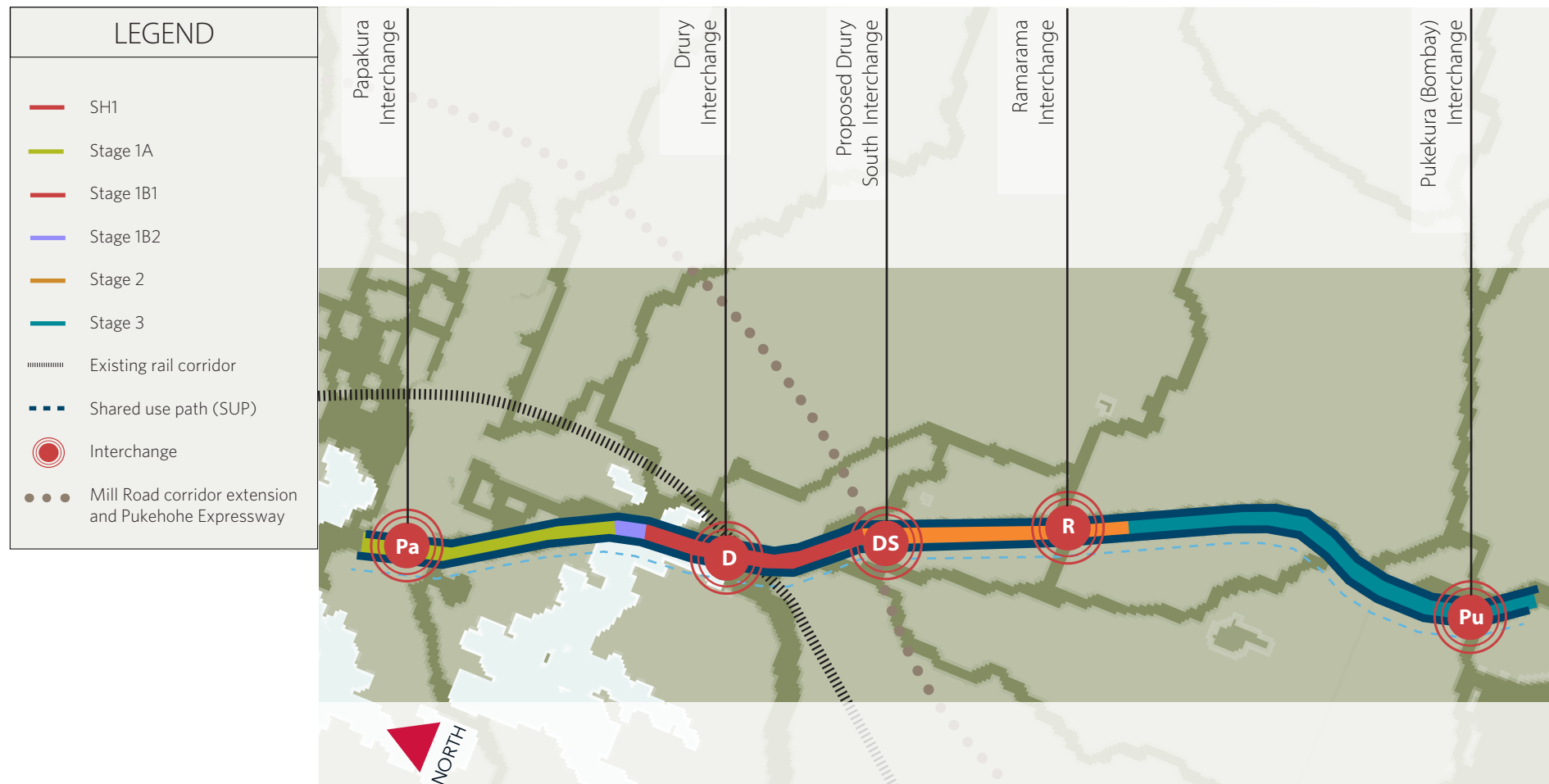
PROJECT OBJECTIVES

The following objectives were set out by the Waka Kotahi at the establishment of the SH1 Papakura to Pukekura project:

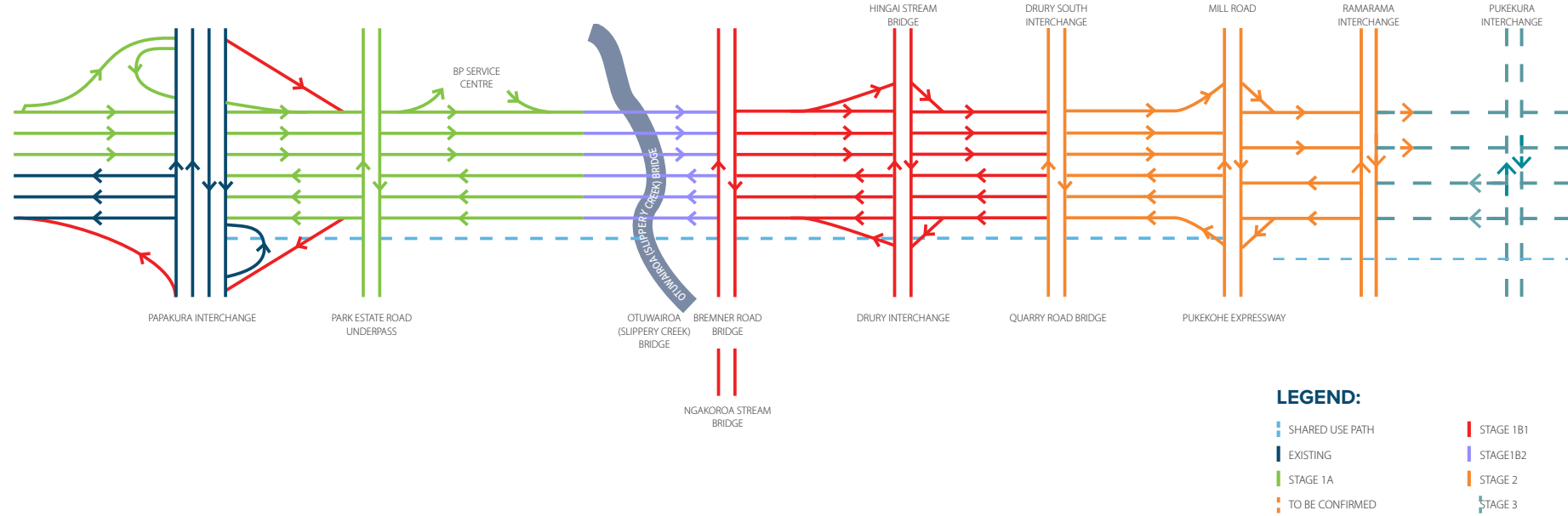
1. Improve the safety and resilience of the state highway network between Papakura and Pukekura;
2. Increase transport choice and accessibility to support growth in the south of Auckland;
3. Support national and regional growth and productivity; and
4. Support the inter-regional and intra-regional movement of people and freight.

ABBREVIATIONS

- AT - Auckland Transport
- AUP - Auckland Unitary Plan
- NZTA - Waka Kotahi (New Zealand Transport Association)
- P2P - Papakura to Pukekura
- PC22 - Plan Change 22
- SEA - Significant Ecological Areas
- SUP - Shared Use Path
- ULDF - Urban and Landscape Design Framework



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OVERVIEW

The project is divided into Stage 1A, Stage 1B1, Stage 1B2, Stage 2 and Stage 3. The original Stage 1B has been broken into into two separate consenting packages (1B1 & 1B2) to facilitate the ongoing engagement process with Mana Whenua in relation to a site of cultural significance introduced by Plan Change 22 (PC22) to the Auckland Unitary Plan east and west of State Highway 1 at Otuwairoa Stream.

STAGE 1A

Consists of widening 4.5 km of south of the Papakura Interchange (of both southbound and northbound motorway) to three lanes and replacing the Park Estate bridge. Works will remain largely within the existing designation. Consenting for this package is almost complete.

STAGE 1B1

This stage includes from just north of the Drury Interchange to the Proposed Drury South Interchange (Quarry Road).

- Papakura Interchange modifications, southbound direct on ramp, northbound on and off ramps;
- Shared Use Path (SUP) Papakura Interchange to north of Otuwairoa bridge and from Bremner Road to just south of Drury Interchange;
- Drury Interchange, NIMT, Bremner Road and Ngakoroa bridges; and
- Great South Road upgrade between local bridges east and west.

STAGE 1B2

This stage includes a section of the SH north of Otuwairoa bridge to north of Bremner Road bridge.

- Permanent solution for Otuwairoa bridges;
- SH1 widening and raising from north of Otuwairoa to Bremner bridge; and
- SUP from northern abutment of Otuwairoa to Bremner Road.

STAGE 2

This stage includes the SH south of the Proposed Drury South Interchange to, and including, the Ramarama Interchange. It will also tie in to Mill Road and Great South Road (Pukekohe Expressway)

- Quarry Road bridge, Drury South Interchange; and
- SUP from south of Drury Interchange to just south of Drury South Interchange.

STAGE 3

This stage includes the SH length south of the Ramarama Interchange to the Pukekohe Interchange.

- Additional lanes north and south and sufficient area for SW management; and
- Upgrades to Ramarama and Bombay Interchanges.

It is noted that the current scope could expand or change depending on budgeting priorities.

A2: URBAN AND LANDSCAPE DESIGN FRAMEWORK (ULDF)

ULDF PURPOSE

The purpose of this Urban and Landscape Design Framework (ULDF) is to provide the client, project partners, stakeholders and project team members with an ongoing strategy throughout the life of the project. The ULDF will define and develop the urban and landscape design concepts for the project, while also facilitating their implementation.

It is intended that the ULDF will provide consistency of outcomes across the whole project area, building on the recently completed Southern Corridor Improvements project and other significant projects such as SH20B currently in development by others near to the project area.

The ULDF is developed under the guidance of Waka Kotahi's Urban and Landscape Design Principles (right).



WAKA KOTAHI URBAN DESIGN AND LANDSCAPE PRINCIPLES

Waka Kotahi has a suite of overarching urban design and landscape principles that are relevant to all its projects (Bridging the Gap NZTA Urban Design Guidelines). These include:

Urban Design	Landscape
1. Designing to the context.	1. A context sensitive and place-based approach.
2. Integrating transport and land use.	2. Facilitate green infrastructure and landscape integration.
3. Contributing to good urban form.	3. Understand the physical conditions.
4. Integrating all modes of transport.	4. The right plant in the right place.
5. Supporting community cohesion.	5. Promote biodiversity and build resilience.
6. Maintaining local connectivity.	6. Champion low impact design (LID)
7. Respecting cultural heritage values.	7. Deliver a quality user experience.
8. Designing with nature.	8. Low maintenance and whole of life value.
9. Creating a positive road user experience.	9. Safety in design.
10. Achieving a low maintenance design.	10. Facilitate community engagement and a collaborative approach.

It is also important that any Waka Kotahi project respects kaitiakitanga, and appropriately reflects and (where possible) enhances iwi connections to moana and whenua.

ULDF OBJECTIVES

Taking into account the overall project objectives and the Waka Kotahi urban design and landscape principles, the following urban design and landscape objectives have been determined for the Papakura to Pukekura Project:

- ULD-1 Provide for cultural and historical expression throughout the project.
- ULD-2 Enhance the existing landscape within the project corridor addressing both environmental and social aspects.
- ULD-3 Create and enhance connectivity along and across the corridor to expand and strengthen alternative transport opportunities.
- ULD-4 Incorporate Crime Prevention Through Environmental Design (CPTED) principles and objectives along the corridor and address related safety and crime prevention.
- ULD-5 Meet or exceed water quality standards.
- ULD-6 Celebrate and enhance important landscape features such as stream corridors, marine areas, open spaces and recreation sites.
- ULD-7 Consider whole of life costs and minimise potential future maintenance costs (including traffic management and safety requirements).

ULDF OVERVIEW

The framework is divided into the following sections:

SECTION A: Project Overview

The project background and its objectives across the length of the corridor.

SECTION B: Corridor Context

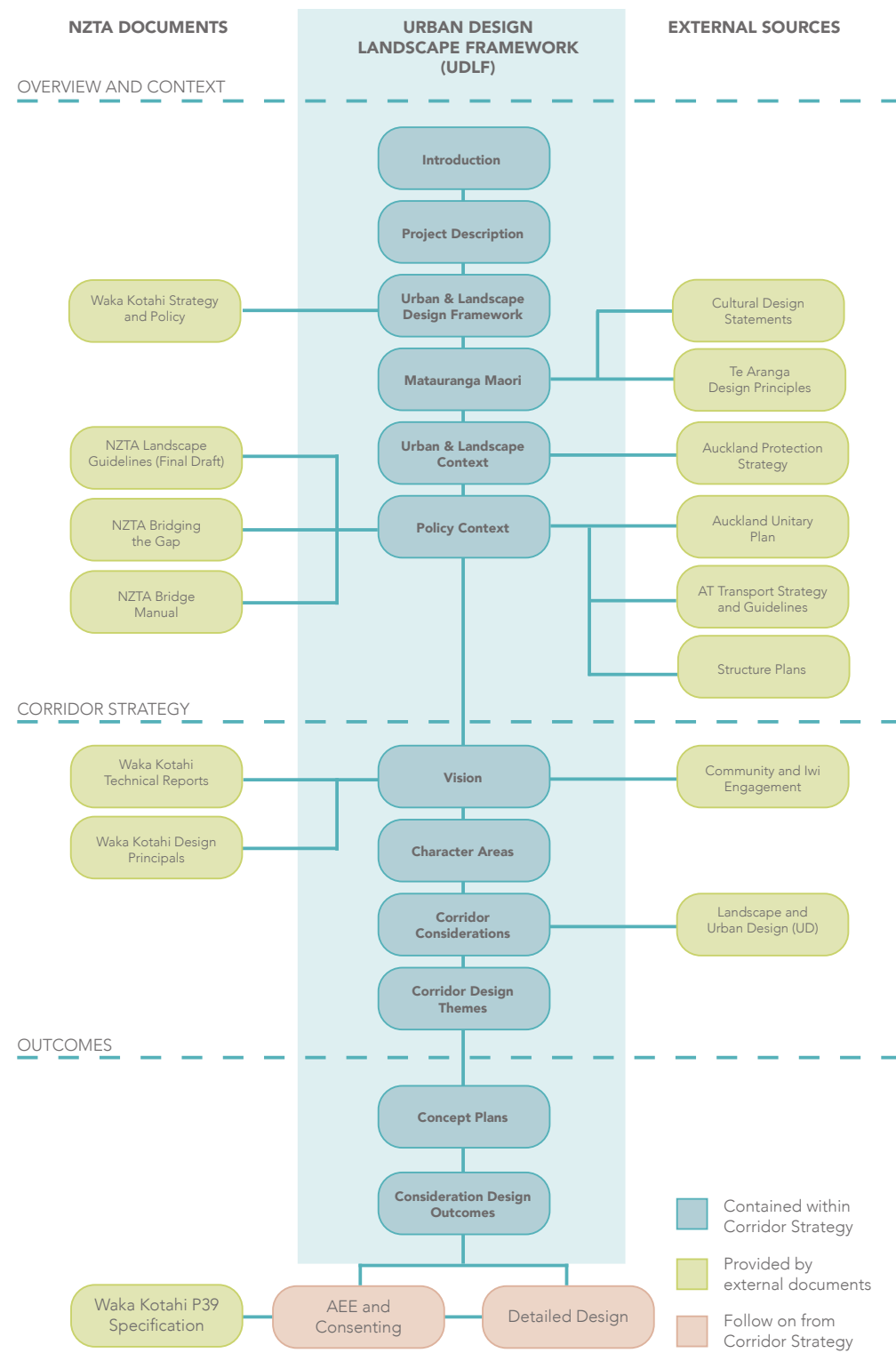
An understanding of the environment (both physical and cultural) and the planning dynamics within the context of the project.

SECTION C: Corridor Strategy

Identification of specific design considerations and requirements at specific areas of the project that reflect Māori landscape design values and the cultural narrative.

SECTION D: Anticipated Outcomes

Vision for each area with design outcomes for each consideration. A series of concept plans for each sector.



REFERENCE MATERIAL

This ULDF captures initial design principles and opportunities that have been identified through preliminary investigation and urban design opportunities of the wider landscape and is set within the context of existing strategic Waka Kotahi guidelines including:

- Bridging the Gap, NZTA Urban Design Guidelines
- NZTA Landscape Guidelines (Final Draft_September 2014)
- NZTA P39 Specification for Planting
- NZTA State Highway Noise Barrier Design Guide
- NZTA Cycling Network Guidance (online)
- NZTA Pedestrian Planning & Design Guide
- NZTA Sustainability Plan
- NZTA Bridge Manual
- NZTA Performance Guidelines
- NZTA Statement of Intent
- NZ Urban Design Protocol

Waka Kotahi has established a set of objectives which give effect to their responsibility as a signatory to the NZ Design Protocol:

- Transport Networks fit in sensitively with the landform, built and natural environment and communities through which they pass.
- All systems of movement along and across the transport corridor are integrated into the design of projects with good connections and access for communities.
- Design contributes to the quality of the built environment, public spaces and the road user experience.

Policy Documents that feed directly into this ULDF include the Auckland Unitary Plan (AUP), Drury - Opaheke Structure Plan and the Drury South Industrial Precinct and the Supporting Growth Program.

This document has also been developed within the context of Iwi Management Plans and has been written in collaboration with those Iwi who have indicated interest in being involved in the project, including:

Te Ākitai Waiohū
Ngāti Tamaoho
Ngāti Te Ata

Ngāi Tai Ki Tāmaki
Ngāti Whanaunga
Ngāti Maru

A3: MATAURANGA MĀORI

ENGAGEMENT

This project would not be complete without the involvement of mana whenua. Waka Kotahi has an established engagement method through regular Southern Iwi Integration Group (SIIG) hui, which are held monthly. The objective of these hui is to discuss the cultural values within and around the project area, and agree methods in which to respect and enhance these values.

The following iwi are represented at the SIIG:

- Te Ahiwaru
- Ngāti Paoa
- Ngāti Maru
- Te Akitai Waiohua
- Ngāti Tamaoho
- Ngāti Te Ata Waiohua
- Ngaati Whanaunga
- Ngāi Tai ki Tamaki

Members of the project team have been attending SIIG hui on a regular basis through the development of this project. In addition, the authors of this ULDF have also worked with the same iwi on adjacent projects including Southern Corridor Improvements (SCI) and the upgrade of SH20B.

A specific topic of discussion through the SIIG has been the development of this ULDF, and there have been additional sessions to provide input into the development of both this document and the outcomes it seeks to achieve throughout the project.

In addition, three iwi have provided specific cultural values or cultural impact assessments (CIAs and CVAs) to help Waka Kotahi shape the project.

INTEGRATION OF VALUES

No formal process for integrating cultural values has been used. Through discussion with mana whenua, it was agreed that blanket adoption of the widely used Te Aranga Principles (contained within the Auckland Design Manual) was not appropriate, and rather direct engagement and sharing of information across the whole aspect of the project was more favourable.

The key focus is integration of all cultural values within the project - from exploring naming opportunities and delivering environmental outcomes to incorporating graphical representation of Māori culture through patterning and artwork.

Principally, it is recognised that the process of engagement and decision making in partnership is as important to mana whenua as the actual outcomes. This process will continue throughout the project using both the established SIIG and through direct engagement with the contractor on site, such as cultural monitoring during excavation works.

However, the delivered outcomes are also important. Various cultural themes have been explored with mana whenua. These preliminary themes are also captured in the CIAs/CVAs, extracts of which are copied onto the page opposite with permission of each iwi. These themes then form the basis of many of the urban and landscape designs that are presented throughout this ULDF.

It is important to recognise that whilst only three CIAs/CVAs have been provided, this does not diminish the importance of this project to other iwi and the ongoing desire to respect and enhance all cultural values.

NGAATI WHANAUNGA

Our thoughts go first to our tuupuna, and the tikanga handed down to us, Mana Whenua - Mana Moana. This whakatauaaki refers to the enduring mana of the iwi over our ancestral lands and waters. It reminds us of the persistent struggle by our tuupuna to defend our taaonga tuku iho - those treasures handed down by the ancestors. 28. The Taamaki Isthmus, with its numerous and spiritually significant maunga (mountains) and craters, the Waitemataa and Manukau harbours, the motu (islands), the Taamaki River, Whau and other portages that connect the harbours, swamps, the multiple coastal bays, headlands, and gullies and streams, all which bear names commemorating important ancestors and past events, are part of a broader cultural landscape of Taamaki Makaurau.

At the outset, we acknowledge that Taamaki Makaurau, Te Waitemataa and Te Maanukanuka o Hoturoawere convergence points for descendants of different chiefly ancestry. Numerous settlements were established in Taamaki Makaurau and on or around the shoreline. Each iwi and/or hapuu have their cultural and ancestral associations to Taamaki Makaurau, Te Waitemataa, Te Maanukanuka o Hoturoa and the surrounding areas within Taamaki Makaurau and we appreciate that others will claim varying levels of interests.

In the early 19th century, Ngaati Whanaunga lived in Hauraki, Taamaki and Mahurangi. In the 1820s, northern Maaori, armed with muskets, invaded that area. Many of Ngaati Whanaunga and its hapuu sought refuge at Maungatautari. In the mid-1830s, Ngaati Whanaunga returned to their kaainga in various parts of Hauraki, Taamaki and Mahurangi.

Among other places, Ngaati Whanaunga resided on the western shores of Tiikapa Moana and established customary rights in this area from the very earliest occupation. These rights expanded over successive generations and were further enhanced by a series of inter-marriages with other iwi in the area. We inherited our customary rights and interests in Taamaki Makaurau and the surrounding area through our tuupuna andahi kaa roa.

A4: KORERO



CULTURAL NARRATIVES

Within the cultural landscape, key cultural resources and relationships (traditional and historic) include:

- Tupuna maunga;
- Nga Taonga i Tuku Iho (the many isolated wāhi tapu and wāhi taonga in the area that collectively exemplifies the networked pā occupation that existed);
- Te Mānukanuka o Hoturoa;
- All the waterways;
- Ara hikoī (traditional walking tracks); and
- Ara tapu (walking tracks of the spirits: the path that leads to Rerenga Wairua through the West Coast, or the walking tracks that leads to an urupā).

The Southern Iwi Integration Group (SIIG) is a collective of iwi who provide guidance to Waka Kotahi on several projects, including this one. In the Joint Cultural Values Assessment for the Drury Pukehohe-Paerata Structure Plans, the SIIG has identified several goals and recommendations that will protect natural and physical resources and the relationships Iwi have with these. Protecting and preserving the traditional lands and taonga associated with the project site will be established through implementing these recommendations.

Advice from the SIIG is that the overarching narrative of the landscape is that it is the 'food bowl of the south'. The landscape was an important area for cultivating kumara and many fruit species.

Common sub-narratives include:

- The arrival and settlement of the area;
- Waka landings linking with important tracks linking Tāmaki Makaurau and Waikato;
- Important waterways frequently used by waka to travel and trade;
- Important Pā sites; and
- Military camps set up by the British and subsequent (often forced) relocation of Māori settlements.





NAMING OPPORTUNITIES

Recognising and celebrating the significance of Mana whenua restores Iwi connections to specific ancestors and events associated with them. It provides the opportunity to enhance a sense of place, by incorporating narrative and customary practices within the detailed design.

The process of changing geographic place names has already begun by Ngāti Tamaoho in settlement legislation including:

- Maketu Stream to Te Maketu Awa;
- Symonds Stream to Mangapū Awa;
- Slippery Creek to Otūwairoa Awa;
- Waihoihoi Stream to Waihoehoe Awa;
- Hays Stream to Waipokapū Awa;
- Naming of an unnamed bluff to Te Māunu a Tū Bluff; and
- Naming of unnamed historic sites as:
 - Pōkino Kainga
 - Puhitahi
 - Purapura
 - Te Teoteo Pā
 - Whatapaka Pā.

In addition, Pratts Road Historic Reserve, a Crown Protected Area, is being renamed to Te Maketū Historic Reserve and Hays Stream Conservation Area is being changed to Waipokapū Stream Conservation Area.

As the project develops, it is anticipated that new names will be introduced across the area, or may be assigned to important structures (such as bridges) within the project area. Opportunities include:

- Te Hunua Stream, the “high infertile land”
- Waipokapu (Hay’s Stream)
- Mangapu (Symonds Stream), and
- Waihoihoi (now remembered in the name for Waihoehoe Road).
- The Mangapu and Waihoihoi combine with the “Awa Paheke” (“Slippery River”) named after the slippery rocks in the vicinity.

OTHER OPPORTUNITIES

The following key opportunities have been identified to reflect and enhance cultural values through the project:

- Restore sites of wāhi tapu;
- Retain viewshafts where possible;
- Whakapapa riparian planting consistent with local biodiversity;
- Contribute to the enhancement of waterways potentially affected by the project, reinstating the mauri of waters;
- Establish and enhance ecological corridors;
- Visually and physically connect open green spaces and areas of wāhi tapu;
- Māori inspired patterning;
- Naming of structures and features;
- Architectural form and detailing reflecting local korero; and
- Māori art to reflect local korero and brighten a potentially dark space.

Source: Historic Heritage Topic Report Drury Structure Plan August 2017

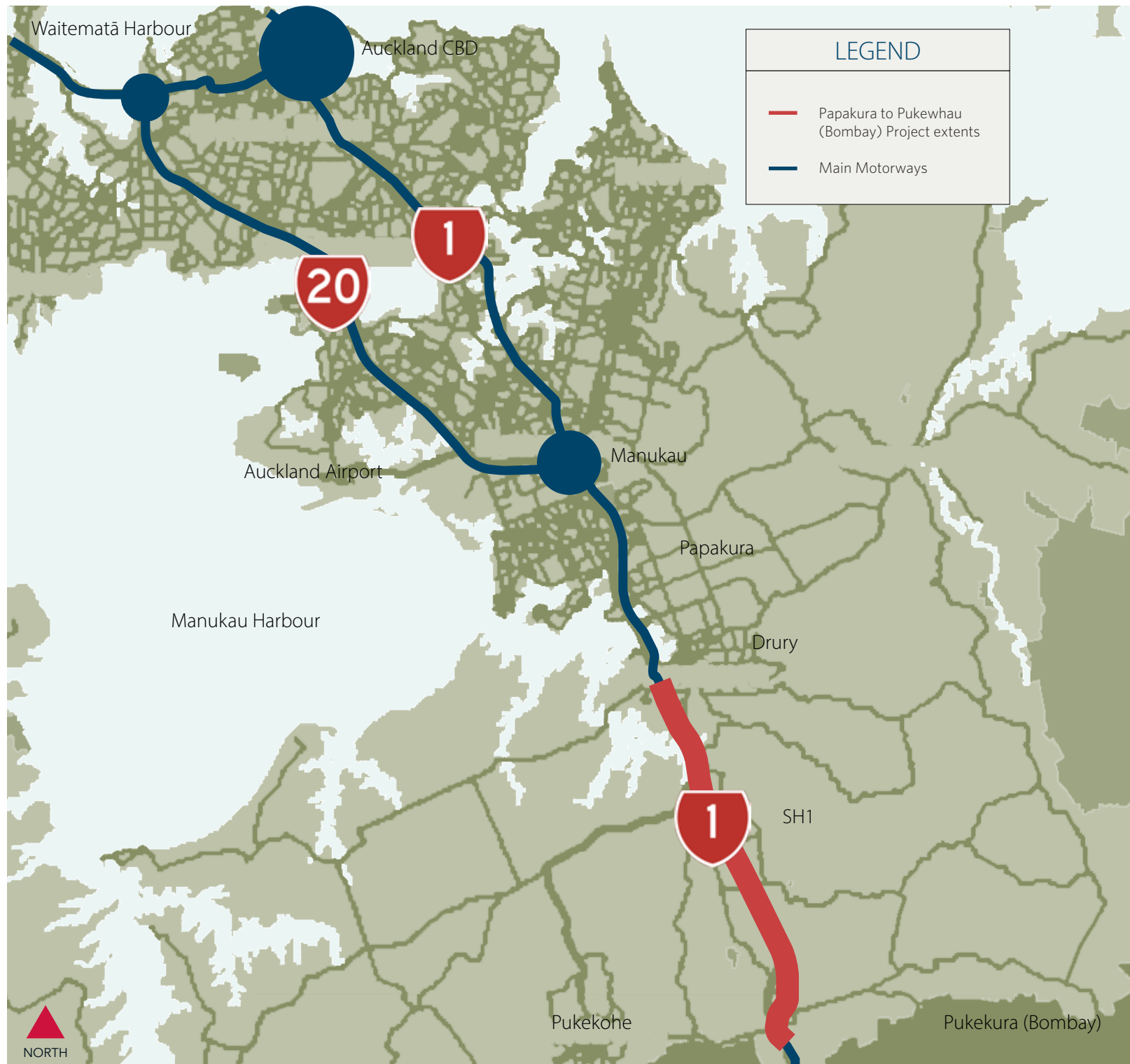


SECTION B: CORRIDOR CONTEXT



- B1 CONTEXT OVERVIEW
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- B4 LANDCOVER & LANDUSE
- B5 BIODIVERSITY
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- B7 WATERWAYS & SIGNIFICANT ECOLOGICAL AREAS
- B8 PARKS & OPEN SPACES
- B9 URBAN FORM
- B10 URBAN DEVELOPMENT
- B11 PUBLIC POLICY
- B12 WAKA KOTAHI

B1: CONTEXT OVERVIEW



Not to Scale

The Project is located in the southern area of Auckland, south of Papakura and extending southwards, west of Drury. To the southeast is the developing area of Drury South, and much of the western side of the project is also under significant urban development.

The existing motorway is a dominant feature of the landscape. It was first constructed in the early 1960's, as an alternative main route into Auckland to Great South Road. Over time, SH1 has been extended such that it now provides a continuous motorway corridor from Waikato to Auckland CBD, with additional motorway connections to the north and west. For some time it has marked a boundary between urban development to the east and rural landscape to the west. As such, much of the existing landscape has an open rural character.

However in more recent times there are signs of increasing urbanism to the west. Around Karaka and north of Drury Creek, development is more tangible, where dwellings are in the early stages of occupancy. At the north end of the project MADE Group are well into the development of Auranga, which will provide 2,650 dwellings and a small centre. All of these developments will fundamentally alter the rural landscape through which the road currently passes into one that is significantly more structured and manicured.

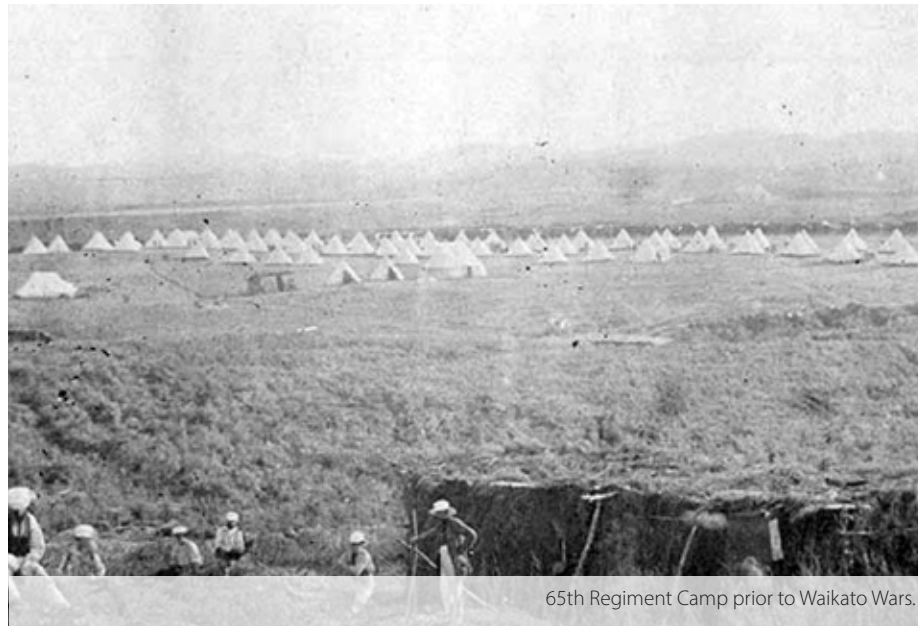
Having said that, other than some residential properties either side of the project area north of Papakura Interchange, there are limited immediate residential neighbours throughout the project. The Drury township is located to the west of the Project, this currently being a relatively small collection of commercial and retail buildings, but directly adjacent to the motorway is a moderately sized industrial area. A few rural dwellings are located in near proximity to the road, but these are likely to be developed as the wider area is developed.

The stream corridors that comprise of Drury Creek, Ngakaroa Stream and Hingaia Stream provide an important natural counterpoint to the more developed/developing areas of the landscape, and are in reality the only significant natural elements of landscape. Even so, the stream banks are heavily modified with poor quality riparian vegetation and eroded stream banks littered with structures and modified earthworks.

Immediately to the north, the Southern Corridor Improvements (SCI) project (Manukau to Papakura) is in the latter stages of construction; into which this project will directly link into. The SCI project has resulted in changes to the character of the motorway corridor by the introduction of noise walls and extensive motorway planting, as well as a new pedestrian bridge and Shared Use Path.

In summary, the project is located in a heavily modified landscape that continues to undergo significant change as a result of increased urbanism. Whilst currently views to the west are over rural land, planned and current development is already transforming this view. Within the next 5 years, such development will result in the Project being located in a predominantly urban environment.

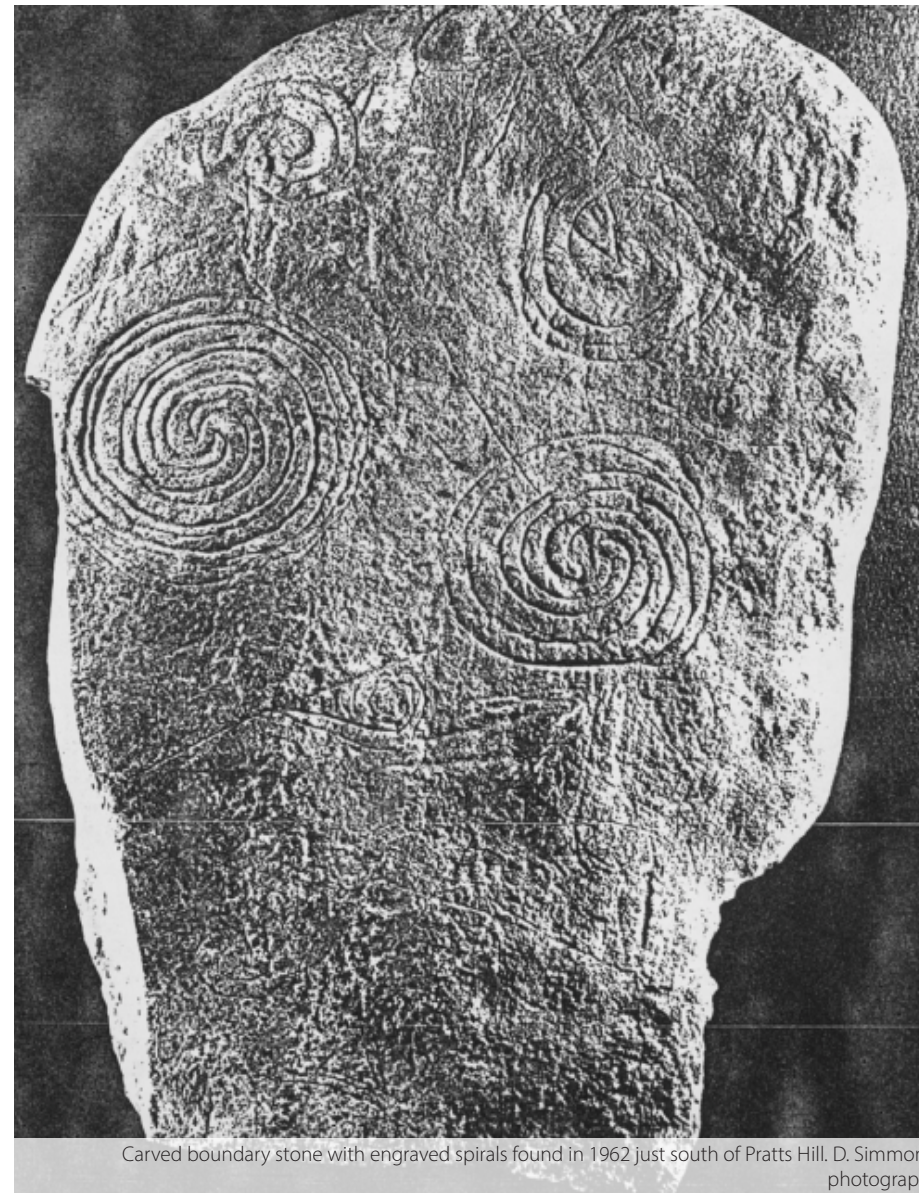
B2: HERITAGE



65th Regiment Camp prior to Waikato Wars.



The Drury Pottery & Fireclay Works.



Carved boundary stone with engraved spirals found in 1962 just south of Pratts Hill. D. Simmons photograph.

Photos sourced from auranga.co.nz.

The project site has a complex heritage to both Māori and European due to its strategic geographic position and the natural resources it offered. Some notable historic events are included below.

Crew from the Tainui waka and other ancestors of Ngāti Tamaoho including Nga Oho, were among the earliest inhabitants of this area and its surrounds.

The Opāheke papakainga and pā was located at the confluence of Otuwairoa Stream (Slippery Creek) and Drury Creek. It was a strategic vantage point for Ngāti Tamaoho allowing them to control the movement of people, food and goods throughout their rohe (territory).

Military camps were established in the area during WWII, with one of these locations currently housing one of the largest commercial horticultural glass houses in New Zealand.

Coal was discovered in the streams of Drury and Waihoihoi Coal Company was established along with an early fireclay brick industry. Work began on the horse-drawn tramway from the port to the coal mine (The Mineral Railway). This was the first railway in the North Island and triggered the establishment of an Auckland – Drury line.

Cultural heritage describes the way of living developed by a community and passed on from generation to generation, including customs, practices, places, objects, artistic expressions and values (Vecco, 2010; Auckland Regional Council, 2009a).

It is the legacy of knowledge, things and intangible attributes of a group or society that are inherited from past generations, maintained in the present and passed on to future generations.

Cultural heritage includes:

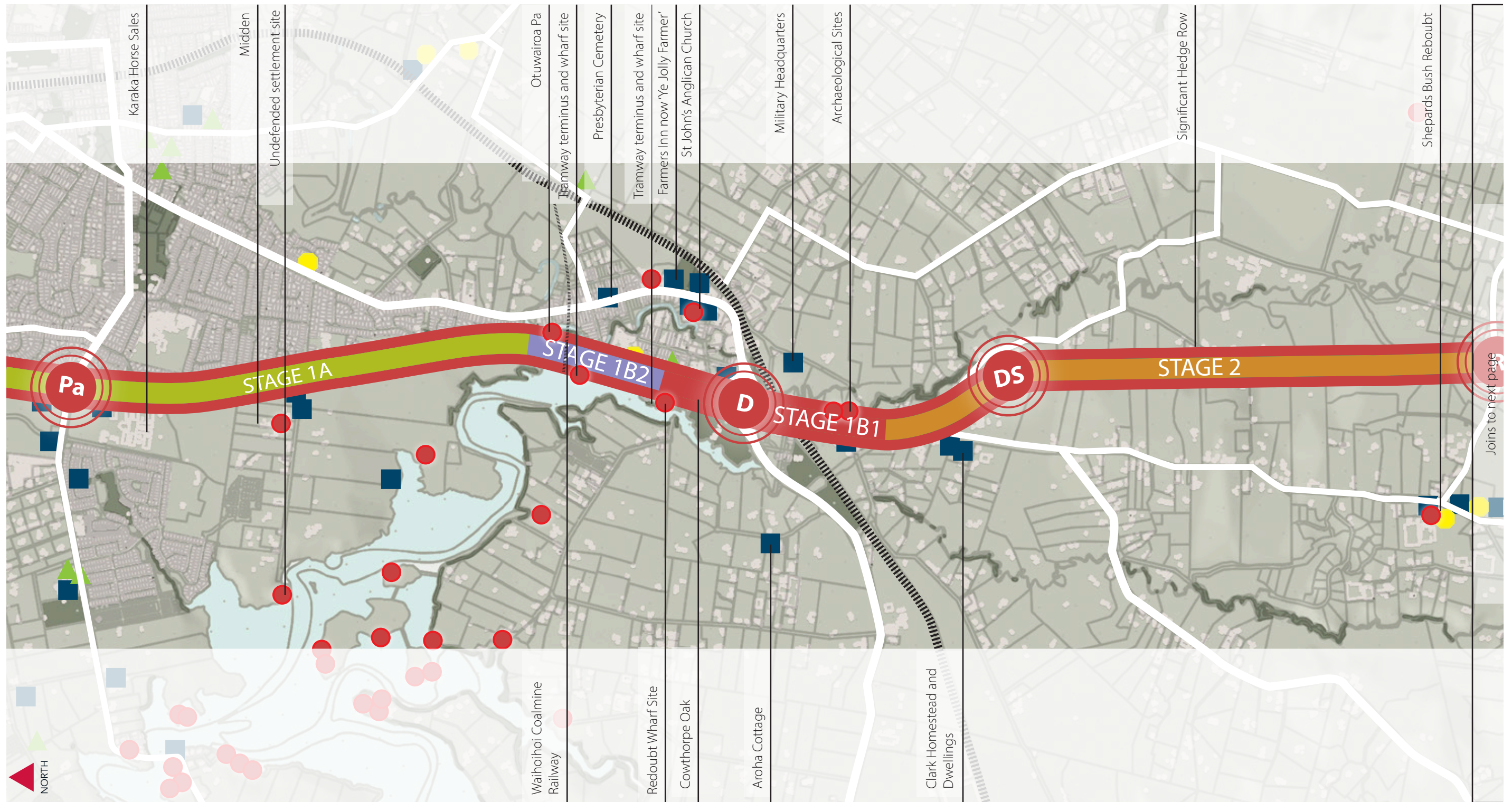
- tangible culture such as buildings, monuments, landscapes, books, works of art and artefacts;
- intangible culture such as folklore, traditions, language and knowledge;
- natural heritage including culturally significant landscapes and biodiversity;

It includes Māori and non-Māori heritage. (Auckland Council, 2012b).

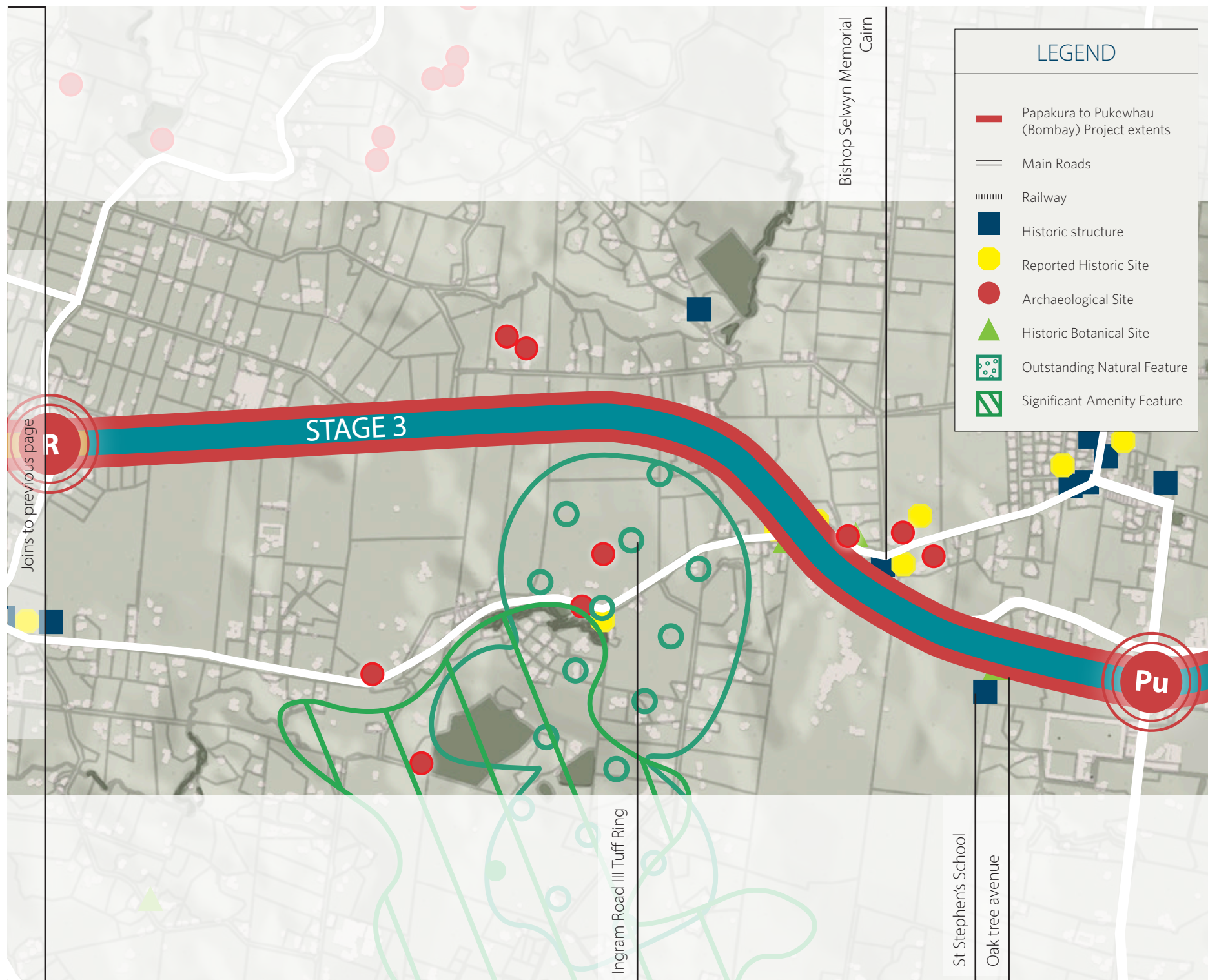
Environment and Cultural Heritage evidence report June 2018

Source - Historic Heritage Topic Report Drury Structure Plan August 2017

B3: SIGNIFICANT LANDSCAPE FEATURES



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SIGNIFICANT FEATURES

Several historic heritage sites and features exist along the project corridor which will require detailed investigation and assessment.

The Auckland Unitary Plan identifies a number of Significant Features, both heritage and landscape based.

Going forward, these sites can be recognised:

- Testing if assumptions around the significance of historic heritage places are correct through interaction with local communities and knowledge holders;
- Identifying possible strategic partners and funding streams to support historic heritage research, conservation and interpretation;
- Identify areas of archaeological sensitivity as an 'alert layer' for future development;
- Explore the potential for historic heritage places to develop a heritage trail and support local identity and the tourist economy;
- Enhance the public understanding of historic heritage places and knowledge through improved public access (e.g. continuous esplanade reserves, new cycle paths), presentation, interpretation and maintenance of significant historic heritage places; and
- Enhance information accessibility through alternative media devices (e.g. audio, QR Codes).

The project area contains a number of significant trees recognised in the AUP. These include:

- A *Quercus robur* is reputed to have grown from the Cowthorpe Oak mentioned in the Domesday Book. (In the 1960's the motorway was deviated around the tree with a retaining wall to protect it.
- A group of trees (including *Vitex lucens*) associated with the Bishop Selwyn Monument.
- Other trees along the road corridor including rows of common oak and existing shelter belts.

IDENTIFIED LANDSCAPE FEATURES

The Unitary Plan Identifies Outstanding Natural Landscapes, Outstanding Natural Features and Outstanding Natural Character areas. The nearest identified area is the 'Ingram Road III Tuff Ring' which adjoins the project site west of the sweeping HW curve between the Proposed Drury South and Ramarama interchanges.

B4: LANDCOVER & LANDUSE



See next page for legend



Sources: Ecology Assessment Drury Structure Plan 30 August 2017
Auckland Protection Strategy &
Indigenous Terrestrial and Freshwater Ecosystems of Auckland

HISTORICAL LANDCOVER

Modelling suggests that predominantly three forest ecosystem types occurred across the terrestrial extent of the project site.

Puriri forest would have dominated the flattest, more productive soils. Kahikatea forest would have formed along the major stream corridors such as Otuwairoa Awa (Slippery Creek) and Ngakoroa Awa. The more elevated areas would have been Rimu, Taraire, Tawa and Podocarp forest.

The adjacent portion of coastal marine area (CMA) would have been mangrove forest, scrub and salt marsh. The numerous streams would have fused into freshwater wetland ecosystems including oioi and raupo in particular.

CURRENT LANDUSE

The existing Manukau Ecological District is highly modified. It is primarily in pasture, with large areas of urban settlement. Small scattered remnants of modified or regenerating forests of conifer and broadleaved species, especially puriri and taraire, occur throughout. The only large remaining area of 'natural landscape' is the Manukau Harbour itself.

Stage 1A and 1B (1B1 & 1B2) land is dominated by built form surrounding Papakura and to the southern extent Drury Town Centre. It comprises of flat to rolling land with some pasture zoned Special Housing in the AUP.

Stage 2 land is mostly high producing pasture land with flat to slightly rolling landforms. It passes alongside the South Drury Industrial Precinct which has planned an extensive stormwater collection and wetland treatment recreation reserve.

Stage 3 land, south of the Ramarama Interchange, is predominantly on rolling land on the foothills of the Bombay Hills covered with short-rotation cropland amongst the rich red soils. The large hydroponic glasshouses that are visible from the road are located on the site of the WW2 Military Camp.

B5: BIODIVERSITY



See next page for legend



ORIGINAL NATIVE FAUNA*

In forested areas, birds such as kereru, tui, bellbird, yellow and red-crowned kakariki, kaka, kokako, tomtit, fantail, grey warbler, whitehead, morepork, North Island robin, shining cuckoo, North Island brown kiwi, and weka would have been present.

Arboreal native reptiles such as forest, elegant and Pacific gecko and ground dwelling skinks such as copper, ornate, and striped skink would have been common.

In the swampy areas, wetland birds such as banded rail, spotless crane, pukeko, pateke, and bittern would have been common, as would fern bird, Australasian harrier and kingfishers.

ORIGINAL FRESHWATER SYSTEMS*

Due to the gentle topography of the structure plan area, freshwater systems were characterised by low order, low energy watercourses connected to large wetland swamps and fens.

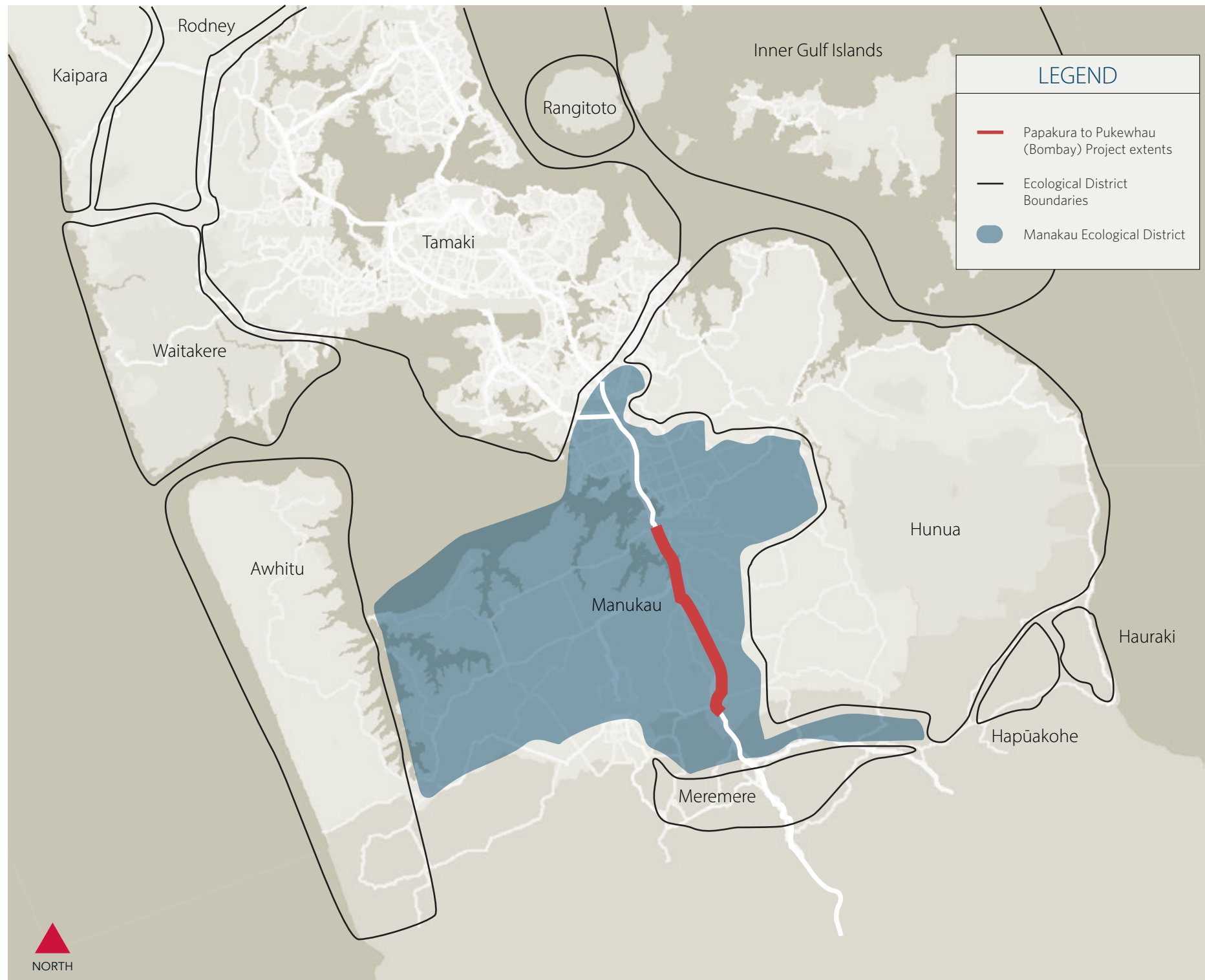
These wetland areas functioned to attenuate water flows and acted as slow release storage areas preventing any downstream channel scouring, and reducing sediment load.

As stated above, these wetland areas would have harboured a variety of native terrestrial flora and fauna. Instream and wetland biota would have included a high diversity of native macroinvertebrates and fish species.

Fish species were likely to have included lowland galaxiid species such as banded kokopu, inanga, and giant kokopu, and also longfin eel, short fin eel, koura, Cran's bully, red fin bully, and black mudfish.

*Source - Above text extracted from Ecology Assessment Drury Structure Plan 30 August 2017 - Section 2.2

B6: HABITAT & ECOSYSTEMS



Auckland is a rapidly growing region and there is constant pressure for urban subdivision and industrial expansion. As natural vegetation is severely fragmented within the area, there are sites that have high value as scarce habitat for threatened species even though other values may be low. When considering development of the original extent of terrestrial ecosystems, the present extent and the extent to which they are protected can be considered against criteria:

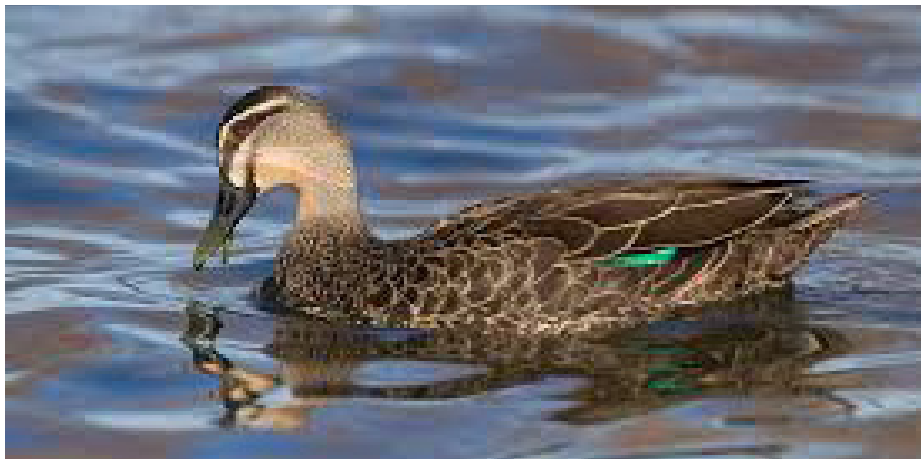
- National Priorities
- Nature Heritage Fund Priorities
- Conservancy Priorities
- Originally Rare Ecosystems
- Threatened Species
- Representativeness
- Sustainability
- Landscape Integrity
- Amenity/Utility
- Marine Protection
- Potential for restoration

All remaining areas of indigenous vegetation have value for protection and restoration because the extent of biodiversity loss in the region (ARC2004) Ecosystems that have been identified as the highest regional priorities are:

- Coastal ecosystems including estuarine, wetland, duneland shrubland and forest
- Volcanic boulderfields
- Sites of nationally critical threatened species
- Sites of originally rare ecosystems

Within the Manakau Ecological District the following priorities for protection have been identified.

- Coastal Ecosystems (dunes, wetlands, shrubland and forest)
- Kahikatea swamp forest



PROTECTION STATUS

The estimated original extent of ecosystems, their present extent and the proportion of their present extent that is protected are outlined in the table below:

Vegetation Class	Original extent	Remaining hectares	% remainiing	Protected HECTARES	% PROTECTED
Brackish estuarine	N/A	1096	N/A	32	3
Coastal Forest	274	13	4	3	23
Dune Vegetation	0	0	0	0	0
Freshwater wetland & Wetland Forest	22244	105	0.4	2	2
Kauri Forest	1541	0	0	0	0
Volcanic Boulderfield	178	0	0	0	0
Podocarp/Broadleaf and Kauri	42462	908	2	103	11
Shrubland	N/A	271	N/A	7	2
Unclassified	N/A	36	N/A	1	2
Total	66699	2429	3	148	6

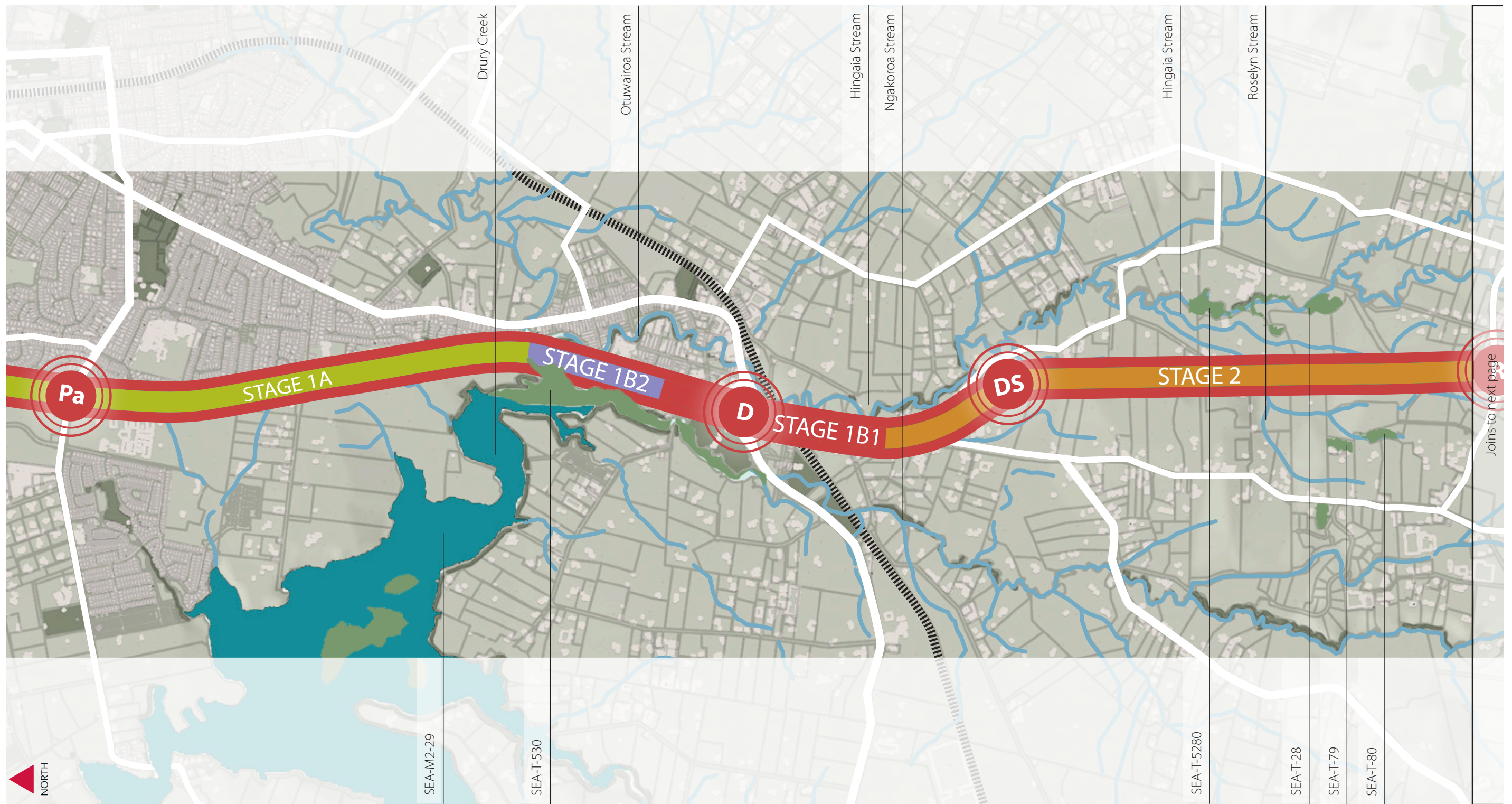
All ecosystems in this Ecological District are severely depleted with only 3% remaining in total. Of this remaining 3%, only an area of 6% are protected (being 0.2% the original extent). The district once contained extensive wetlands and wetland forest almost all of which have been lost.

PRIORITIES FOR PROTECTION

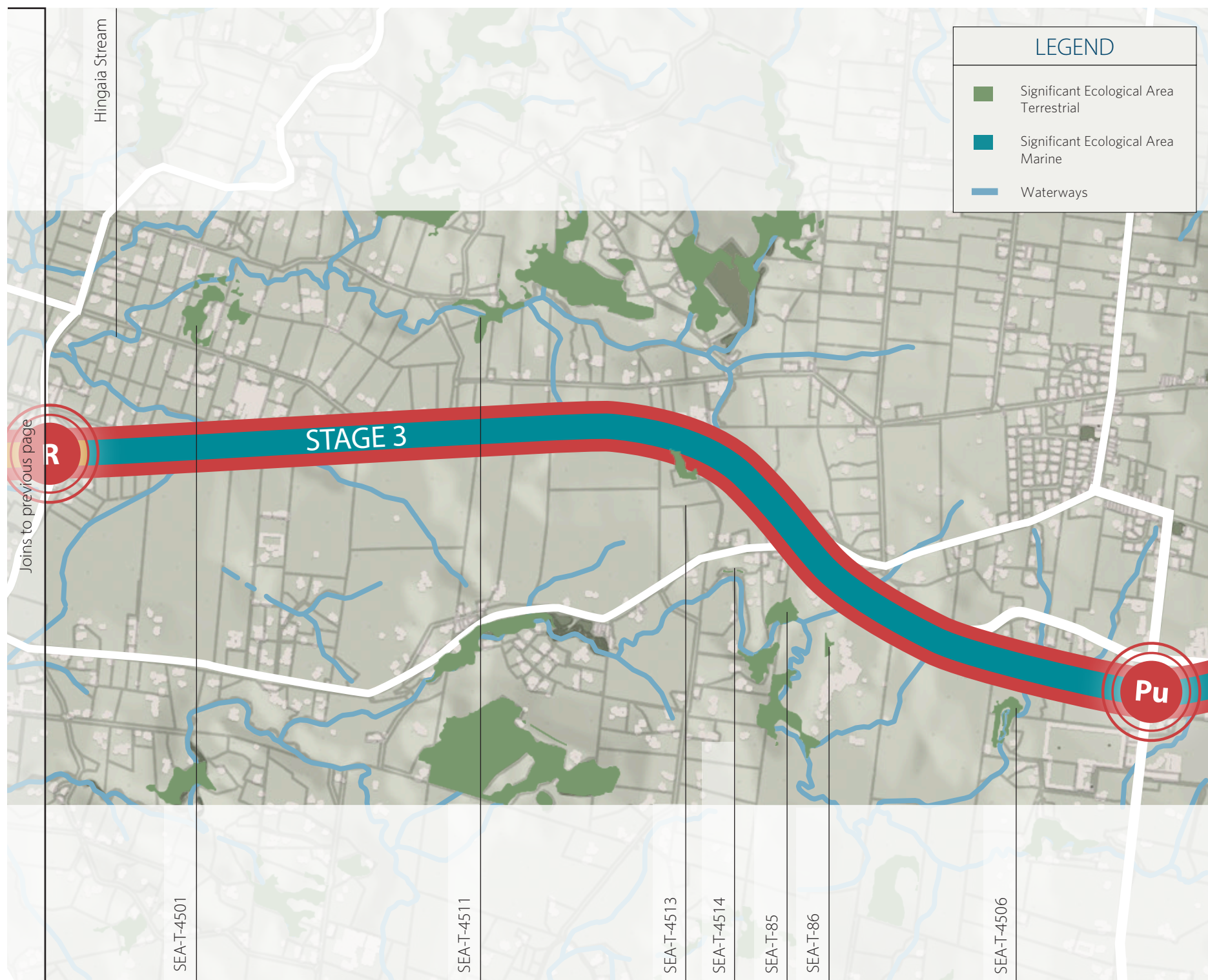
- Freshwater wetlands
- Kahikatea swamp forest
- Coastal ecosystems including estuarine, wetlands, shrublands and forest
- Breeding sites and habitat for *Anas superciliosa superciliosa*
- Sites of originally rare ecosystems where these can be confirmed

Sources: Ecology Assessment Drury Structure Plan 30 August 2017
Auckland Protection Strategy &
Indigenous Terrestrial and Freshwater Ecosystems of Auckland

B7: WATERWAYS & SIGNIFICANT ECOLOGICAL AREAS (SEA)



See next page for legend



WATERWAYS

There are several notable streams through or near the project site that converge at Drury, into Drury Creek and eventually the Pahurehure Inlet to the Manukau Harbour.

Hingaia Stream flows along the eastern edge of the site, joined by Maketu Awa, Waihoihoi Awa, Symonds Stream and Otuwairoa Awa (Slippery Creek) that runs through the Drury Township.

Roselyn Stream flows from the west underneath the State Highway and joins a tributary to Hingaia Stream.

To the west of the project site is the Ngakoroa Stream that also discharges into Drury Creek.

Many of the overland flow paths are farm drains, and have been heavily modified by farming or roading operations.

SIGNIFICANT ECOLOGICAL AREAS

The Auckland Unitary Plan identifies a number of Significant Ecological Areas (SEAs), both land and marine based.

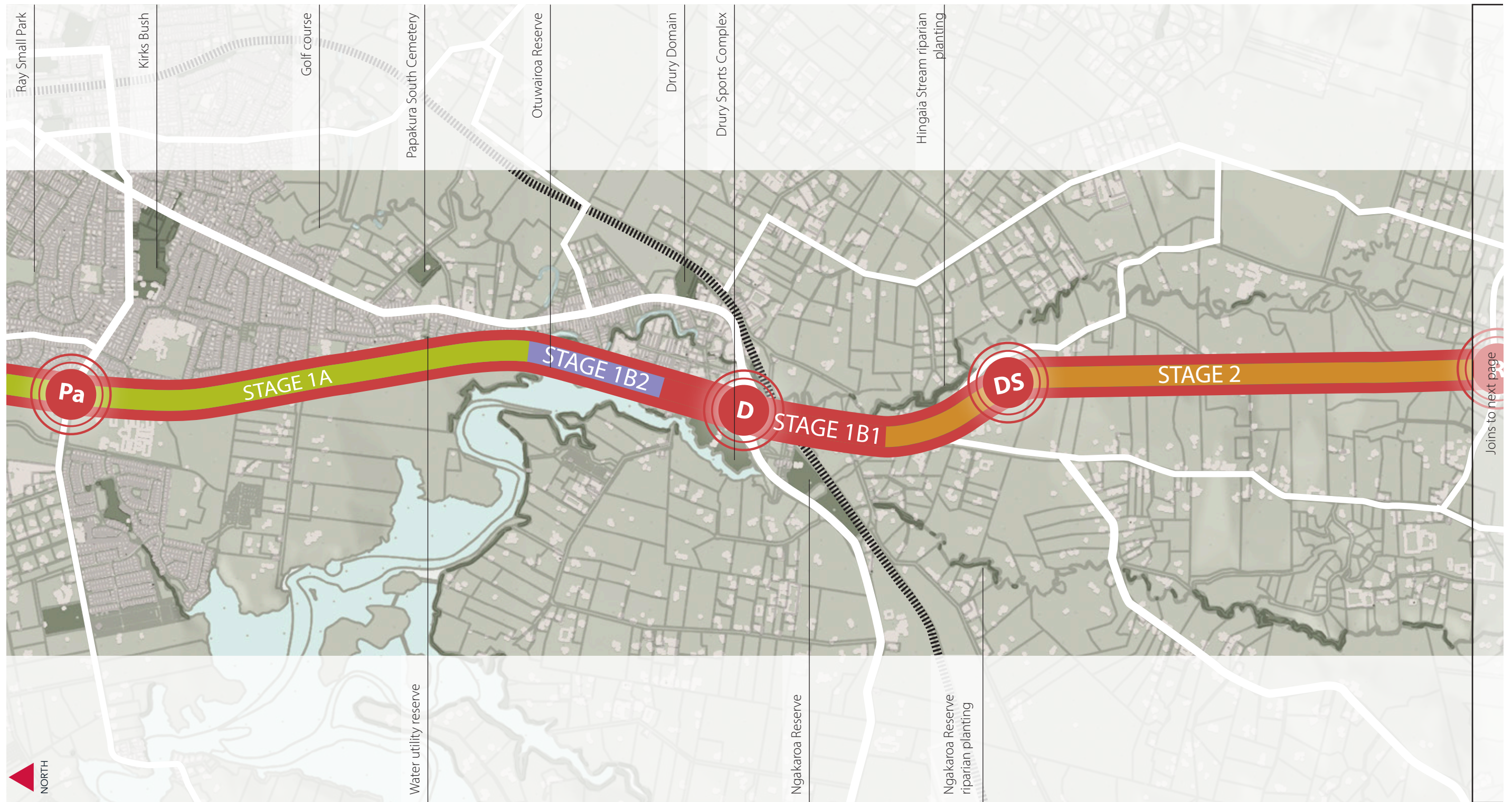
Around the Drury Creek area the SEA's are mostly comprised of inter-tidal habitats with varying degrees of mangroves and eelgrass beds. There are roosting areas for wading birds including an important area for pied stilt.

The upper tidal reaches of Drury Creek is a migration pathway between marine and freshwater habitats for several native freshwater fishes (whitebait). Most notably is the Otuwairoa Awa (Slippery Creek) junction.

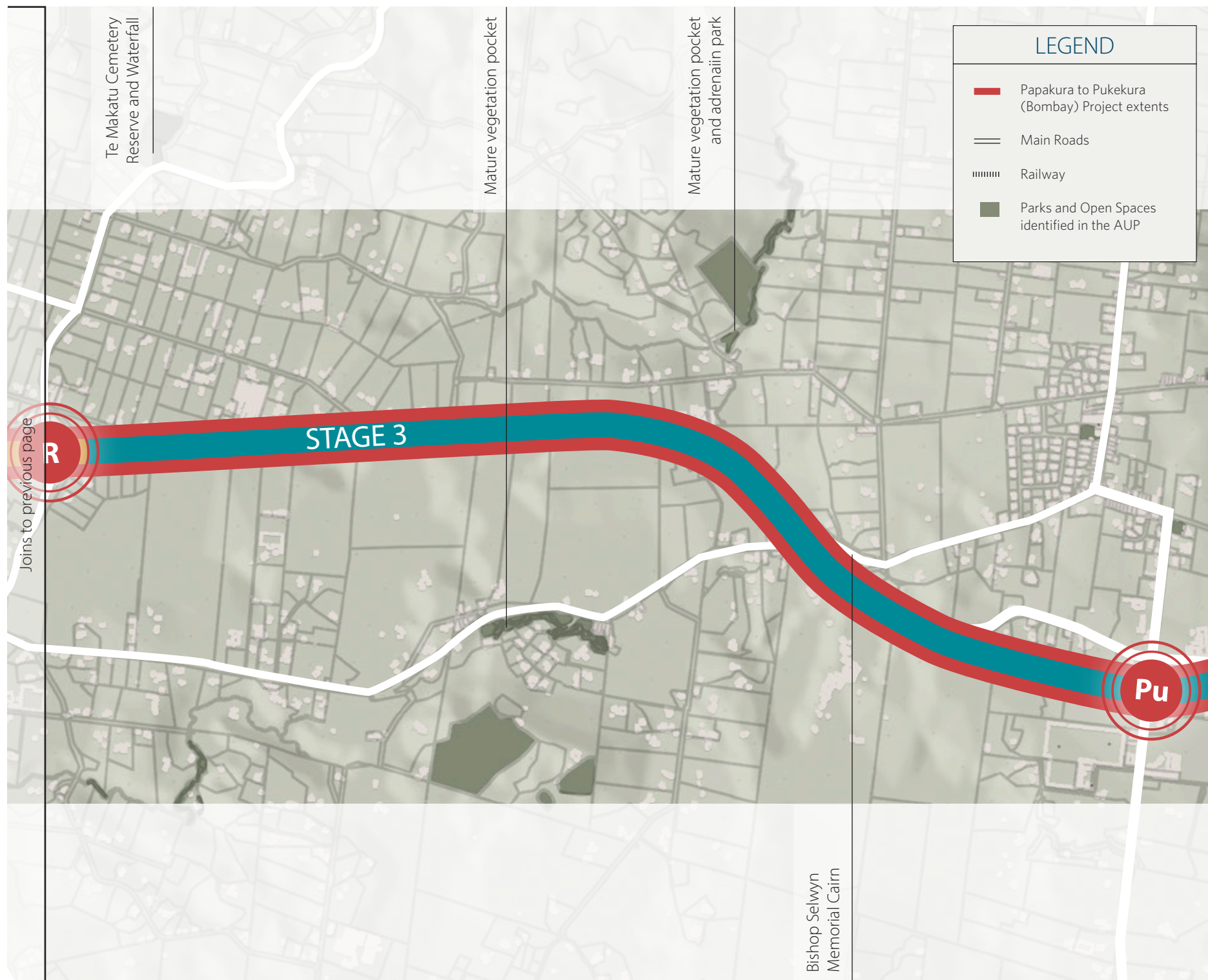
The land based SEA's tend to contain tracts of dense native vegetation including taller trees.

Source - Ecology Assessment
Drury Structure Plan 30 August 2017

B8: PARKS & OPEN SPACES



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PARKS AND OPEN SPACES

Open spaces play an important role in the active and passive recreation functions around the project area.

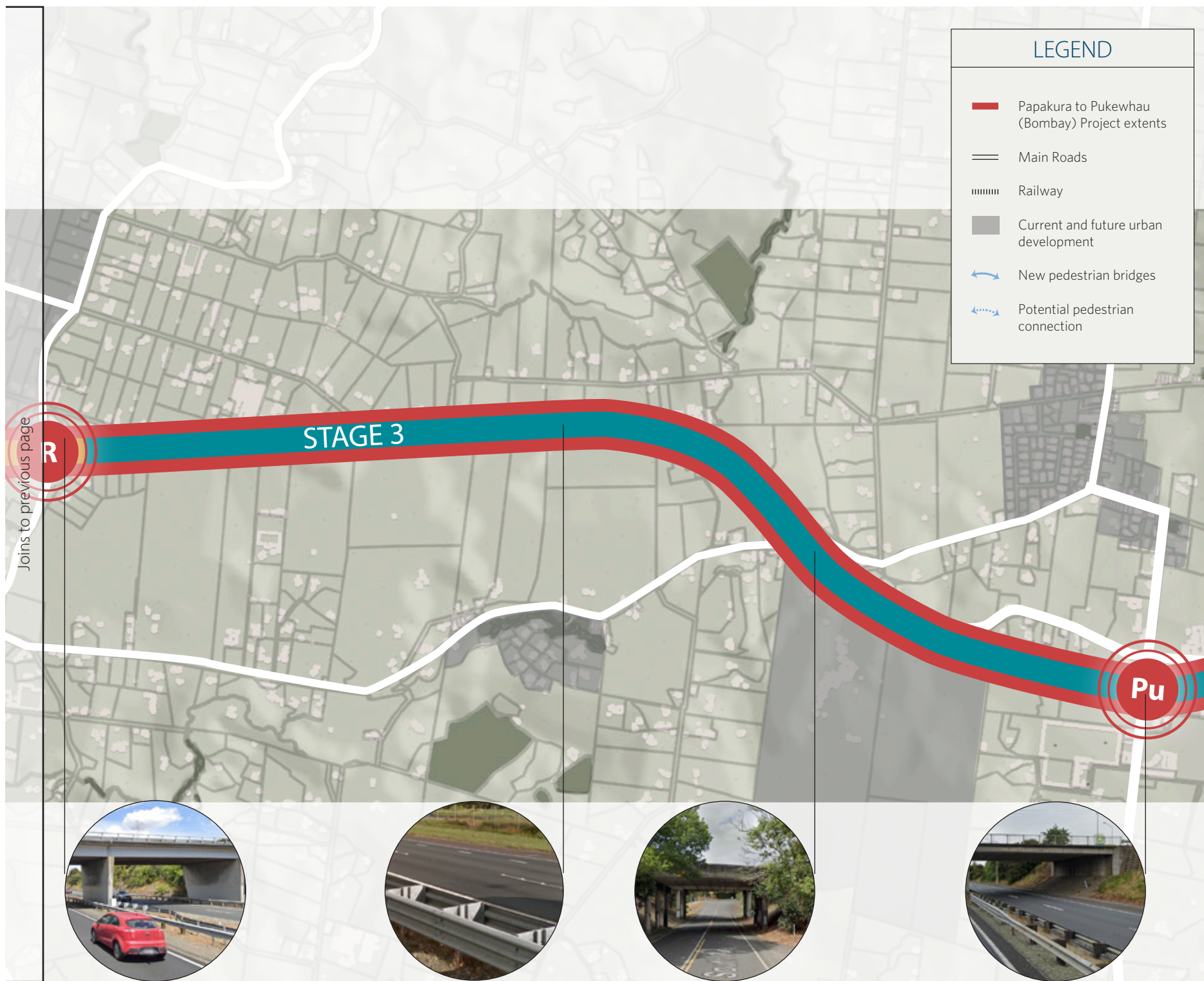
The key open space features around the project area are as follows:

- Otuwairoa Awa (Slippery Creek) is a significant watercourse that meanders through the township of Drury before entering the Manukau Harbour creating an open space corridor.
- Roselyn Stream passes beneath SH1 before joining with Hingaia Stream.
- Drury Sports Park is located adjacent to the Project site and is a significant area of open space.
- Ngakoroa Reserve connects with Drury Sports Park and creates a green corridor connection directly to Ngakoroa Stream and the Pahurehure Inlet.
- The Drury South Industrial Precinct includes extensive stormwater wetlands and treatment systems along the project area.
- Ngakoroa Awa realignments along SH1. Some locations retain a natural form, although many sections of the alignment have been modified and channelled.

Source - Ecology Assessment
Drury Structure Plan 30 August 2017

B9: URBAN FORM





EXISTING URBAN FORM

The project site does not currently have a unifying urban design and landscape character. The existing utilitarian urban form has been developed with little consideration for sense of place or narrative. The southern corridor improvements have been developed within a separate ULDF and the interface between the existing and proposed upgrades will need to be considered in order to avoid any abrupt change in the urban form for motorists.

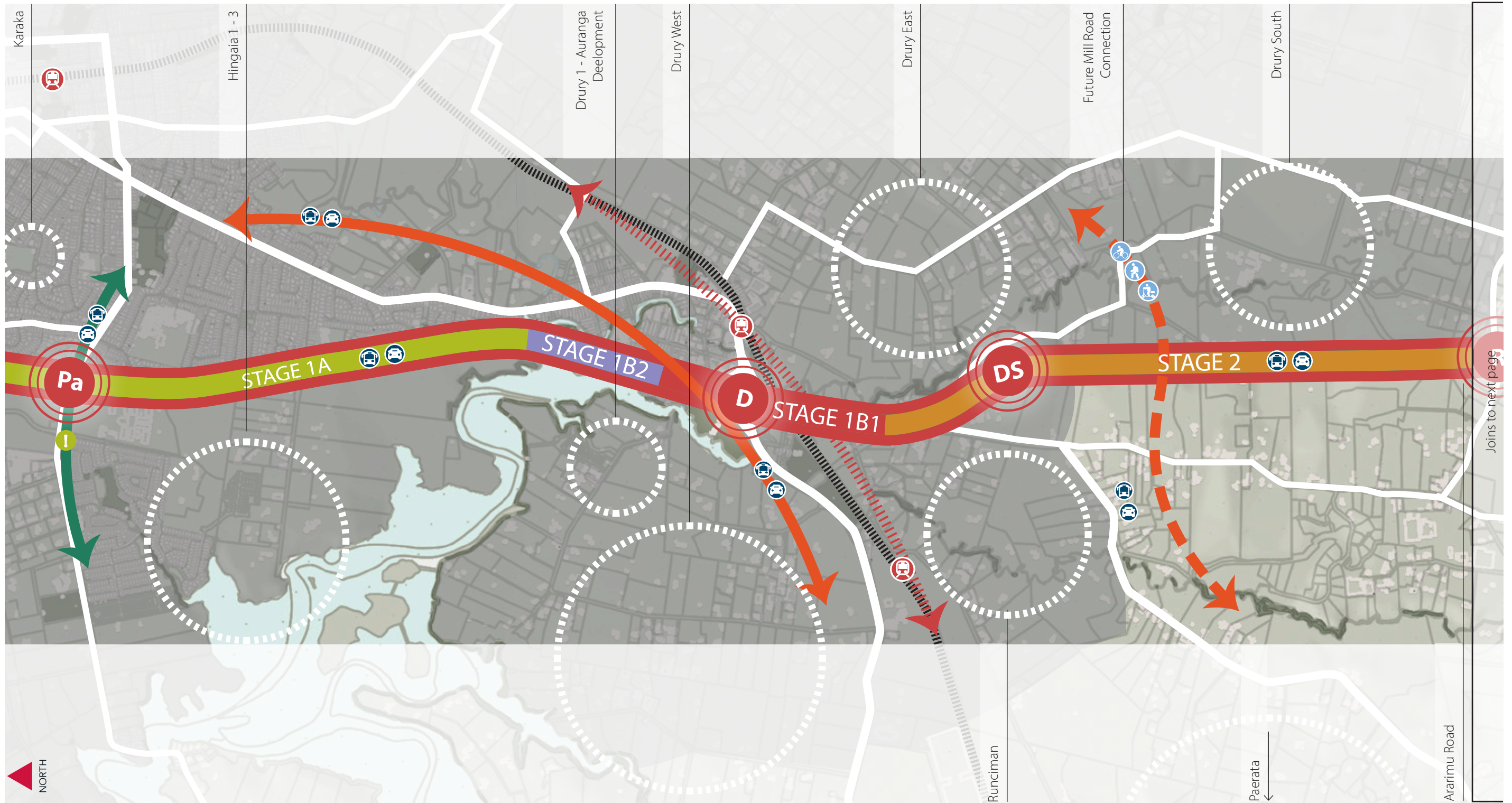
- Retaining walls in the project site vary from natural stone, to precast concrete and there is no consistency throughout the area or a connecting theme.
- The dominant central road barrier consists of wire rope medians and either concrete strips in the northern end of the project site or grass to the south. A portion of solid central medians exist south of the railway overpass. The stretch of road north of Ramarama has little to no side barriers adding to the current rural character.
- There are currently no noise walls present along the project site.
- There is currently no SUP throughout the project site.
- Current overpasses or related built form within the project area lack any design or theme relating to the sites context, heritage or landscape.

ENHANCEMENT PROJECTS

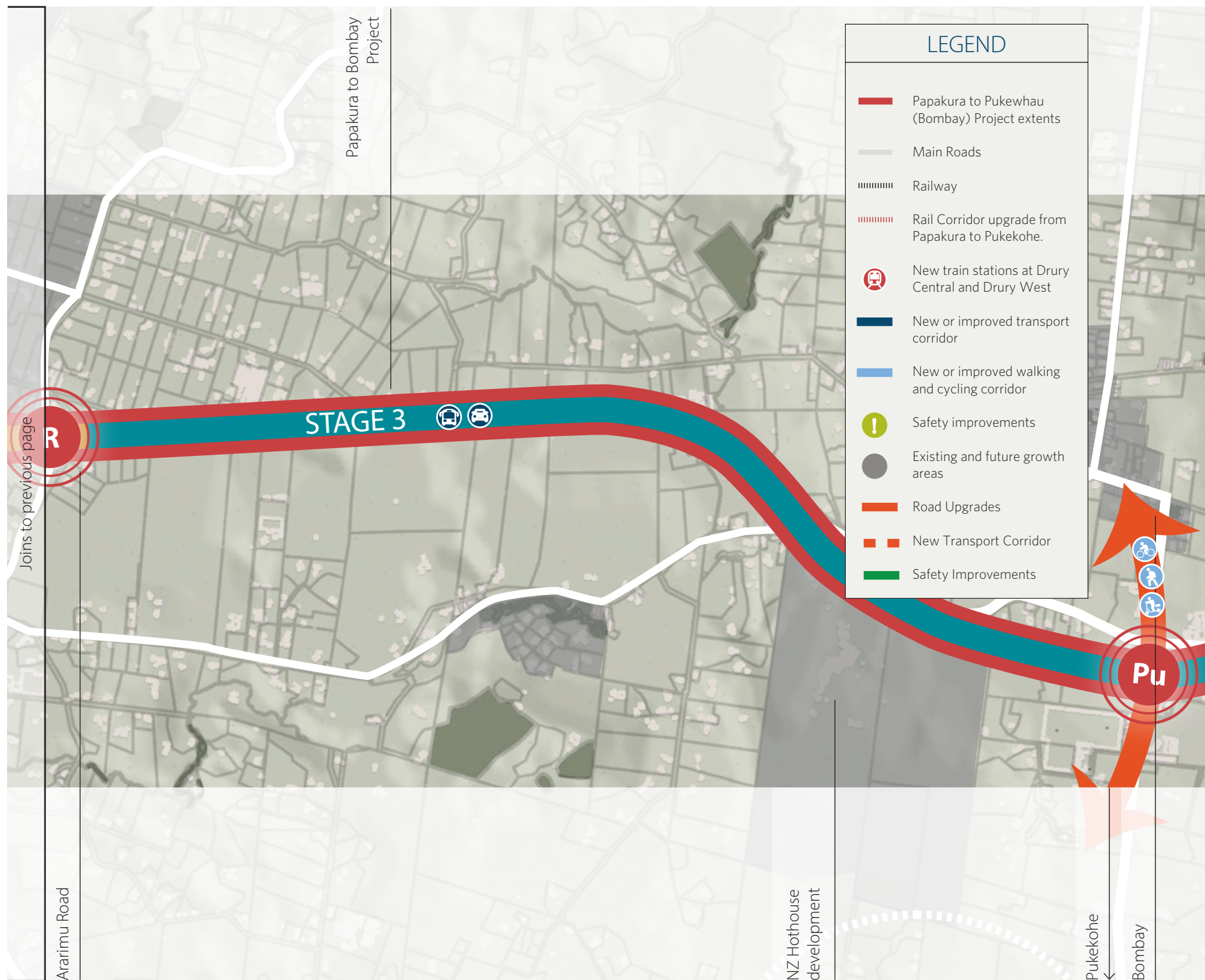
Wai Care is a water quality monitoring, education and action programme for community groups, individuals, businesses and schools across the Auckland region. One of their projects is currently working with local Drury Schools to undertake riparian planting along Otuwairoa Stream (Slippery Creek).

- Pukekikiriki Pā (previously Peach Hill) now has a Management Plan that is run by a joint committee between Papakura Local Board and an advisory Kaitiaki group.
- Auranga development has begun a riparian planting programme along areas of Ngakoroa Stream and Drury Creek.
- Sustainable Coastlines in association with Love your Water Drury, have undertaken community planting days that have been successful in implementing riparian planting along Ngakoroa Stream and Drury Creek.

B10: URBAN DEVELOPMENT



See next page for legend



URBAN DEVELOPMENT AND NETWORKS

A number of strategic transport networks have been identified with strong east west connections as the urban area develops.

KARAKA

The Karaka Precinct purpose is to provide continued use and development of the New Zealand Bloodstock Karaka Sales Centre.

HINGAIA 1 - 3

This precinct is to be developed to provide for logical expansion of the existing Hingaia urban area. The development of the Park Estate Bridge will need to anticipate this future development with opportunities for stormwater and green infrastructure, biodiversity and cross corridor connections. The areas will provide for integrated residential subdivision and neighbourhood centres, new Schools and large open spaces utilising stormwater management systems as future pedestrian and cycle linkages.

DRURY 1 - AURANGA DEVELOPMENT

The development of a local centre with intensive residential development, riparian and conservation management along Hingaia Stream and Drury Creek.

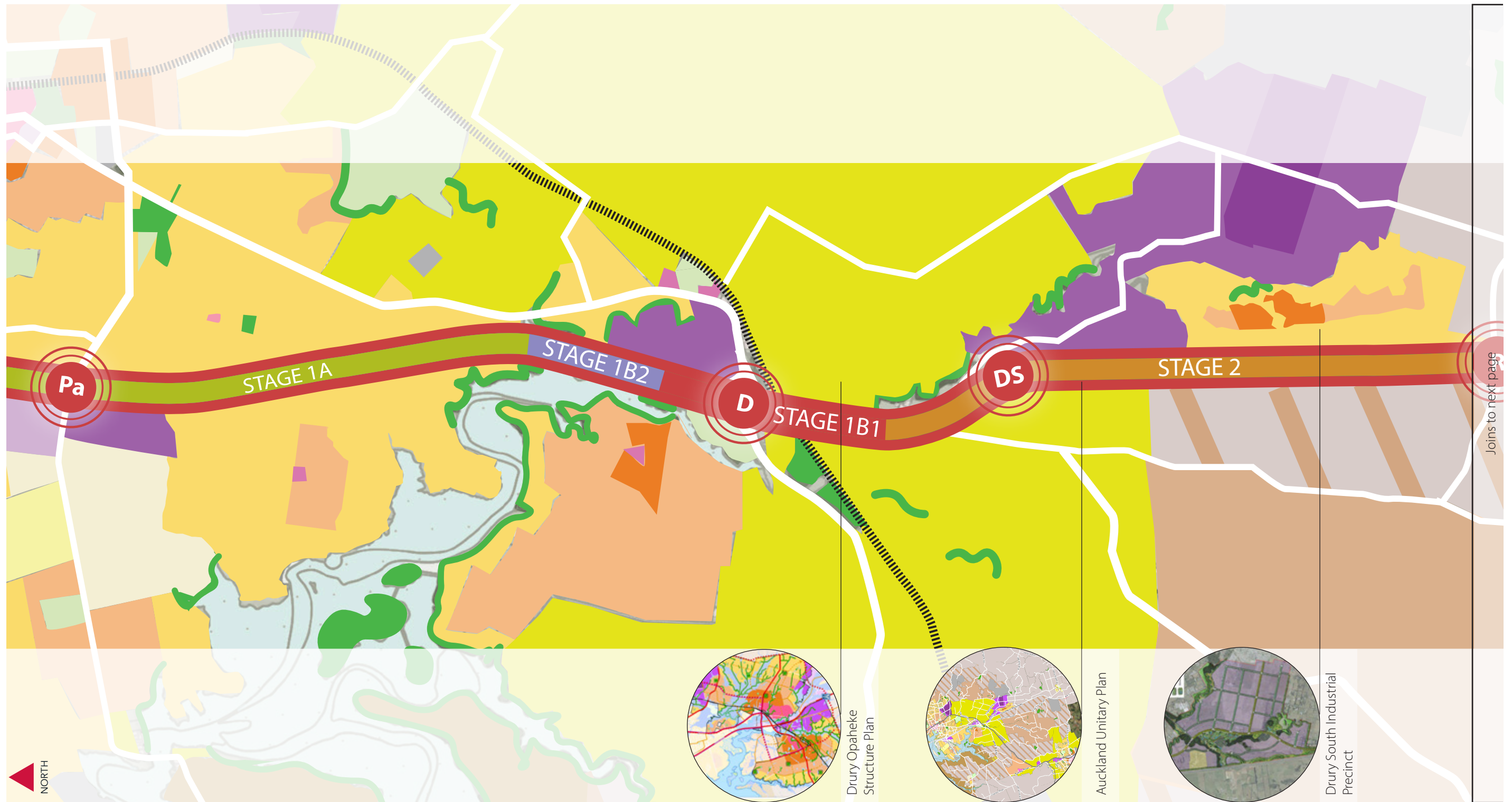
RUNCIMAN

Rural countryside living opportunity integrated with the gentle hills and established vegetation. Waterways could be enhanced to improve terrestrial and aquatic biodiversity.

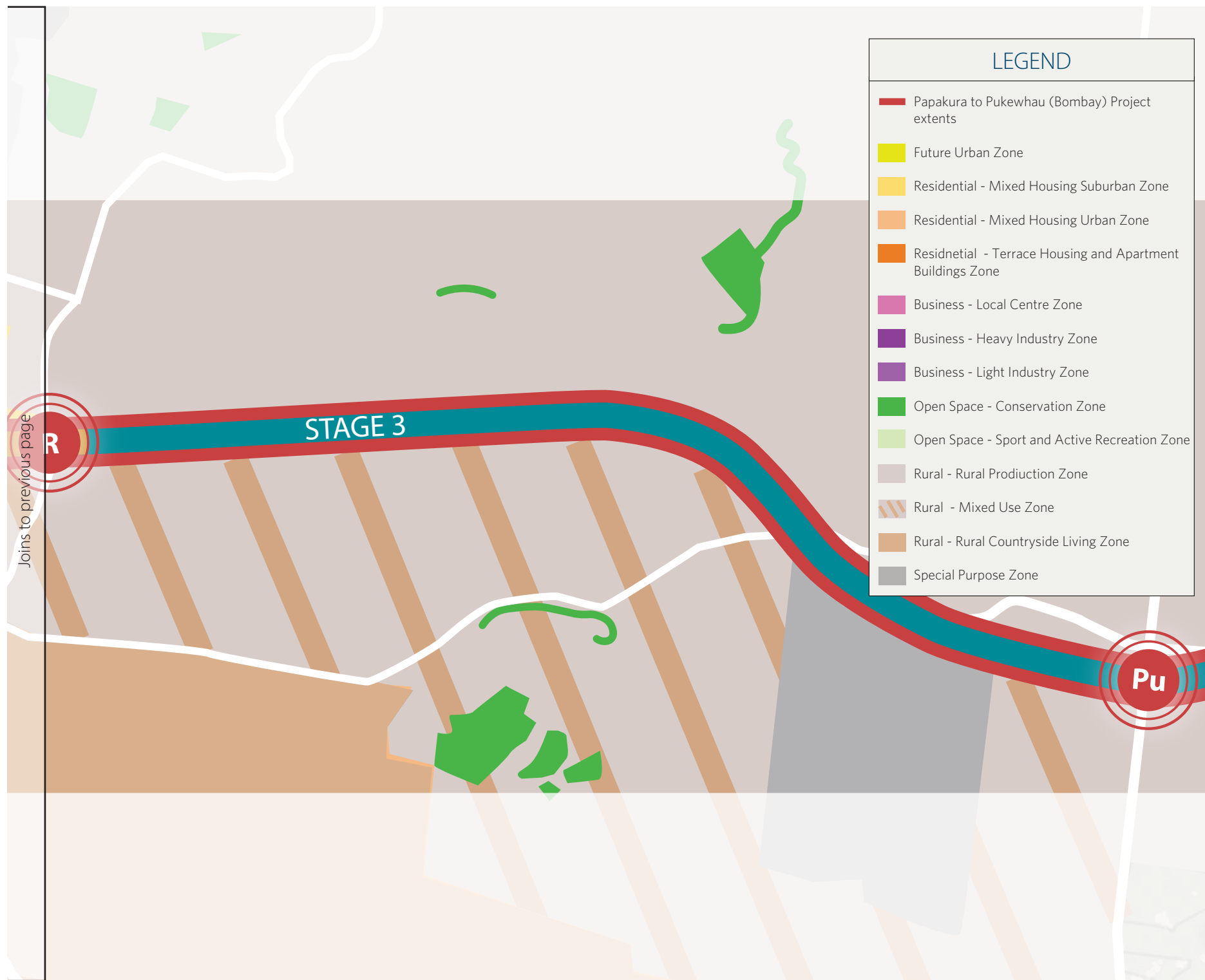
DRURY SOUTH RESIDENTIAL AND INDUSTRIAL

The industrial precinct provides for industrial activities and employment opportunities as well as conservation zones around stormwater management. The residential zone is bound by SH1 to the west and the Drury South interchange proposed as part of this Project will need to be coordinated with this precinct.

B11: PUBLIC POLICY



See next page for legend



AUCKLAND UNITARY PLAN

The purpose of the Auckland Unitary Plan is to assist the Council to carry out its functions to achieve the purpose of the Resource Management Act 1991 (RMA). It is the principle statutory planning document for Auckland.

Given the extent of the project area, the planning context varies along its length and includes a number of different zones. These gradually change from Mixed Residential (suburban), through to Light Industry, Future Urban, Mixed Rural and Rural.

This context assists in identifying the character and land use patterns within the project site that direct the varying design and mitigation treatments.

DRURY OPHEKE STRUCTURE PLAN

The Auckland Unitary Plan has identified Drury-Opaheke as an area for future urban growth and has been zoned Future Urban and guides how and where development will occur.

The Structure Plan provides a detailed examination of the opportunities and constraints relating to the land, including suitability for various activities (e.g. infrastructure). The Plan identifies the effects of development in regards to natural heritage, Mana Whenua, natural resources, coastal environment, historic heritage and special character and how any effects can be avoided, remedied or mitigated. This Section of the document has informed Section D Anticipated Outcomes in this ULDF.

DRURY SOUTH INDUSTRIAL PRECINCT

The Drury South Industrial Precinct is comprised of 361Ha of land that lies between the Drury and Ramarama interchanges on SH1. The AUP has identified specific Objectives, Policy, Rules and Plans for the Industrial zones. Technical inputs have provided detail on potential pedestrian corridors, ecological corridor connections, stormwater management systems, network utility, infrastructure, land use changes and detailed stream and Wetland Rehabilitation Guidelines.





SECTION C: STRATEGY

- C1 VISION
- C2 CORRIDOR CHARACTER AREAS
- C3 PLANTING STRATEGY
- C4 STORMWATER STRATEGY
- C5 MULTIMODAL TRANSPORT
- C6 OVERBRIDGES & UNDERPASSES STRATEGY
- C7 NOISE & VISUAL MITIGATION
- C8 OTHER CONSIDERATIONS



NGAKOROA STREAM

C1: VISION



OTUWAIROA



VIEW FROM BOMBAY HILLS



BISHOP SELWYN MEMORIAL CAIRN

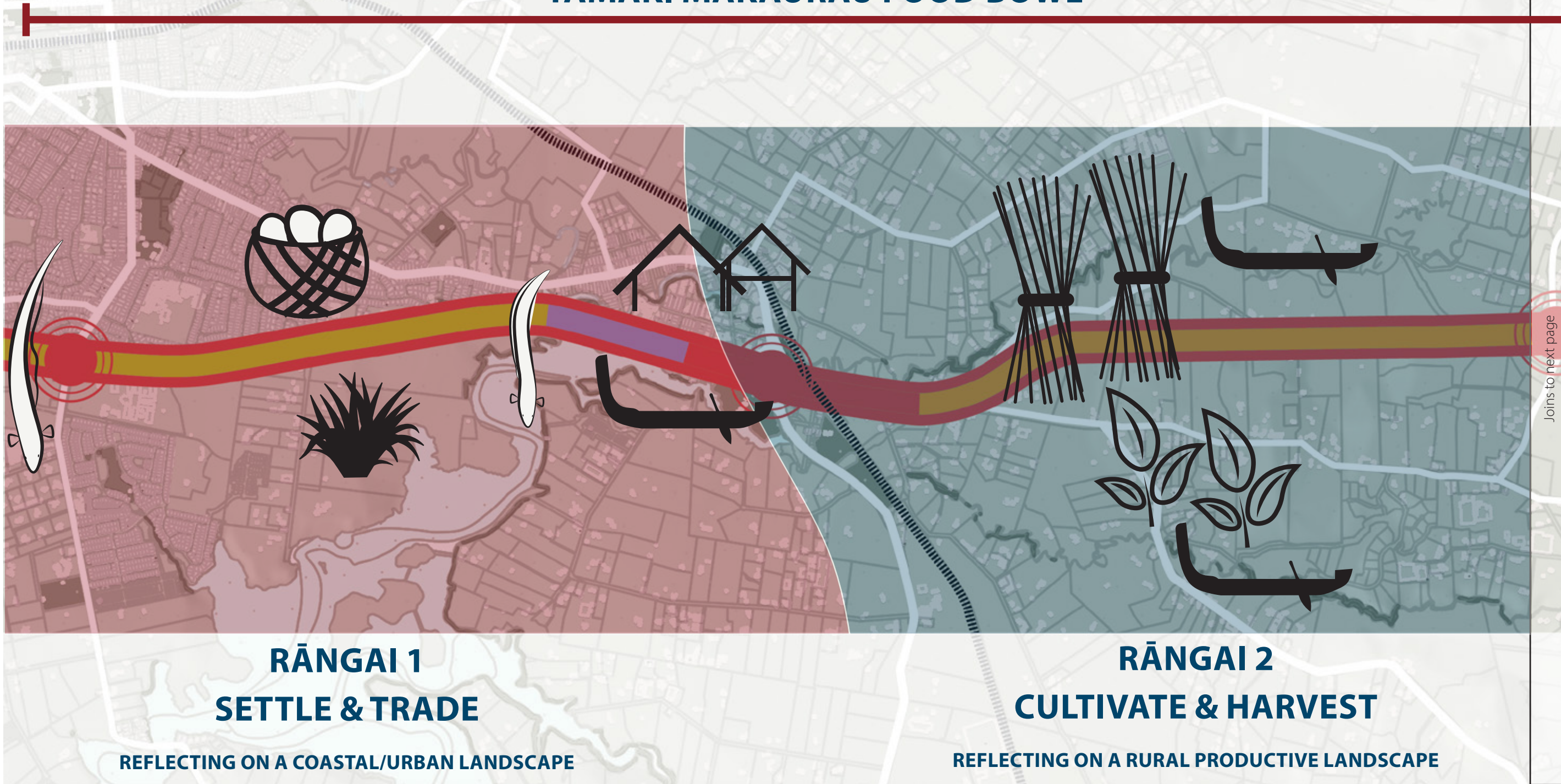
The SH1 corridor is a dominant spine through the South Auckland landscape. It defines how travellers enter, leave and transit through South Auckland, and in a landscape that is undergoing significant change, it will remain a relatively static and familiar route that helps people orient and direct themselves. It is both a waharoa and an awa, a modern day route that people navigate.

Therefore, the urban and landscape design vision for the corridor is for it to reflect and celebrate the underlying natural and cultural landscape through which it passes. To allow users of the corridor to connect to familiar features that become wayfinding reference points along their journey. The intention is to create reference markers that signal points along the journey to help people recognise where they are.

In seeking to achieve this vision, it is recognised that much of the corridor is currently open, with wide visibility across a rural landscape. Such views are changing, and in time urban development will creep close to the motorway. As a result, more distant views to natural landscape features will diminish, and so it will become features closer to the motorway that need to be celebrated. But, where possible, the corridor should also seek to retain a sense of openness, balanced with providing visual and noise mitigation for future neighbours.

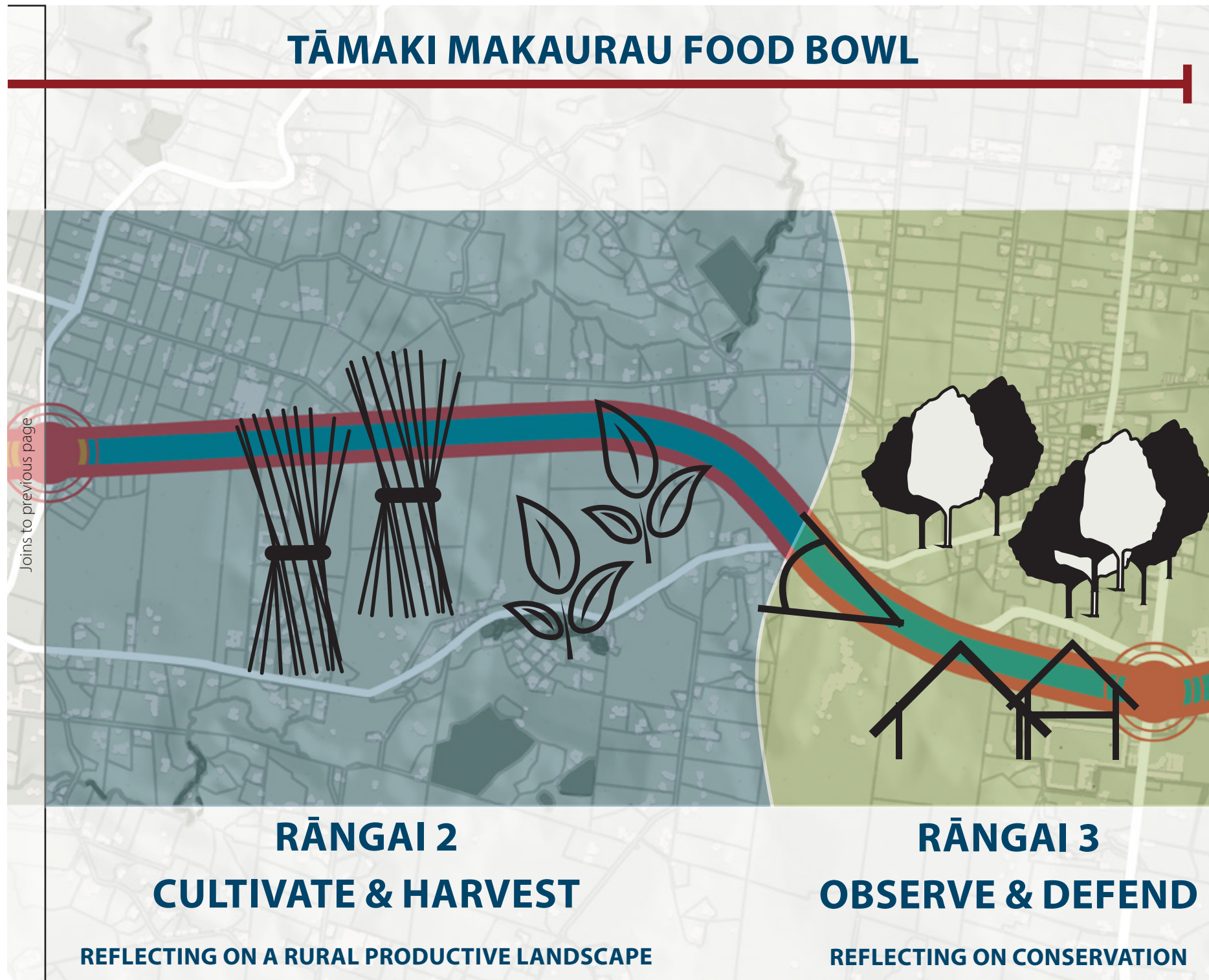
At the same time, the corridor provides a unique opportunity to provide a natural biodiversity corridor that connects the hill country around Pukekura with the coastal inlets at Pahurehure. Each of the interchanges can provide much needed space for sustainable planting and creation of habitat, where the plants along the corridor can become an important seed resource within a wider urban landscape. In addition, such planting can be designed to enhance water quality through effective management of stormwater.

TĀMAKI MAKAURAU FOOD BOWL



See next page for legend

C2: CORRIDOR CHARACTER AREAS



Movement through the corridor follows a change in character and heritage land use from settlement and trading areas, through to rural cultivation ground before heading towards the Waikato over the higher ground. Early settlement patterns provide a model for land use and values.

The combined analysis of the cultural and physical landscape suggests the following character areas across the project:

RĀNGAI 1: SETTLE AND TRADE- COASTAL / URBAN

The urban areas of Papakura and Drury have been desirable settlements for a long time because of its:

- low ground;
- accessibility; and
- rich resources.

RĀNGAI 2: CULTIVATE AND HARVEST - RURAL / PRODUCTIVE

This character area is a highly productive landscape, both historically and currently. Its desirable qualities include:

- its 'middle ground' location;
- more accessible;
- controlled and protected but traversable; and
- resource-rich for produce and animal husbandry.

RĀNGAI 3: OBSERVE & DEFEND - CONSERVATION

The Hunua Ranges and Bombay Hills have higher conservation values and commanding views over the Auckland Region. Its attributes are:

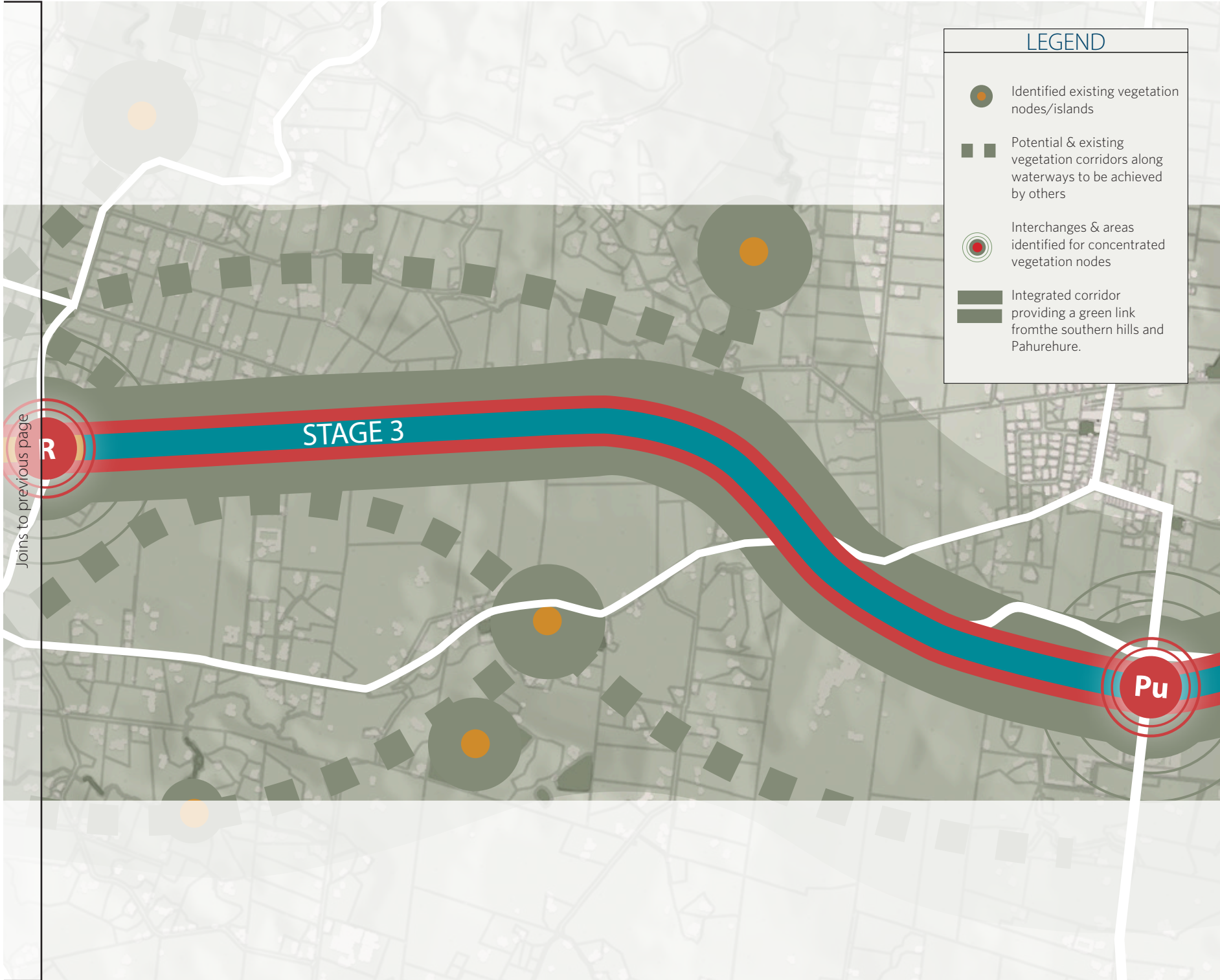
- higher ground;
- commanding views;
- defensive;
- inaccessible;
- controlled; and
- resource-rich for tools and inorganic materials.

Whilst the landscape is undergoing significant change, the development of the corridor can be reflective of the existing and historical character, retaining its role as a familiar route through a dynamic landscape.



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C3: PLANTING STRATEGY



The vision for planting within the project corridor is to develop an ecological corridor between the southern hills and Manakau Harbour. This doesn't need to be a wide corridor, but one that is punctuated by nodes where possible, with links to existing green nodes within a few kilometres of the corridor (and particularly the area around Otuwairoa). Primarily the green corridor is to be established as a seed source and for fauna navigation, rather than specific habitat, but additionally it will provide enhanced amenity outcomes.

The plants used need to be resilient and able to be sustained over a long period of time in what is a relatively challenging growing environment. To ensure such longevity, plants should be sourced from a variety of locations to ensure localised biodiversity.

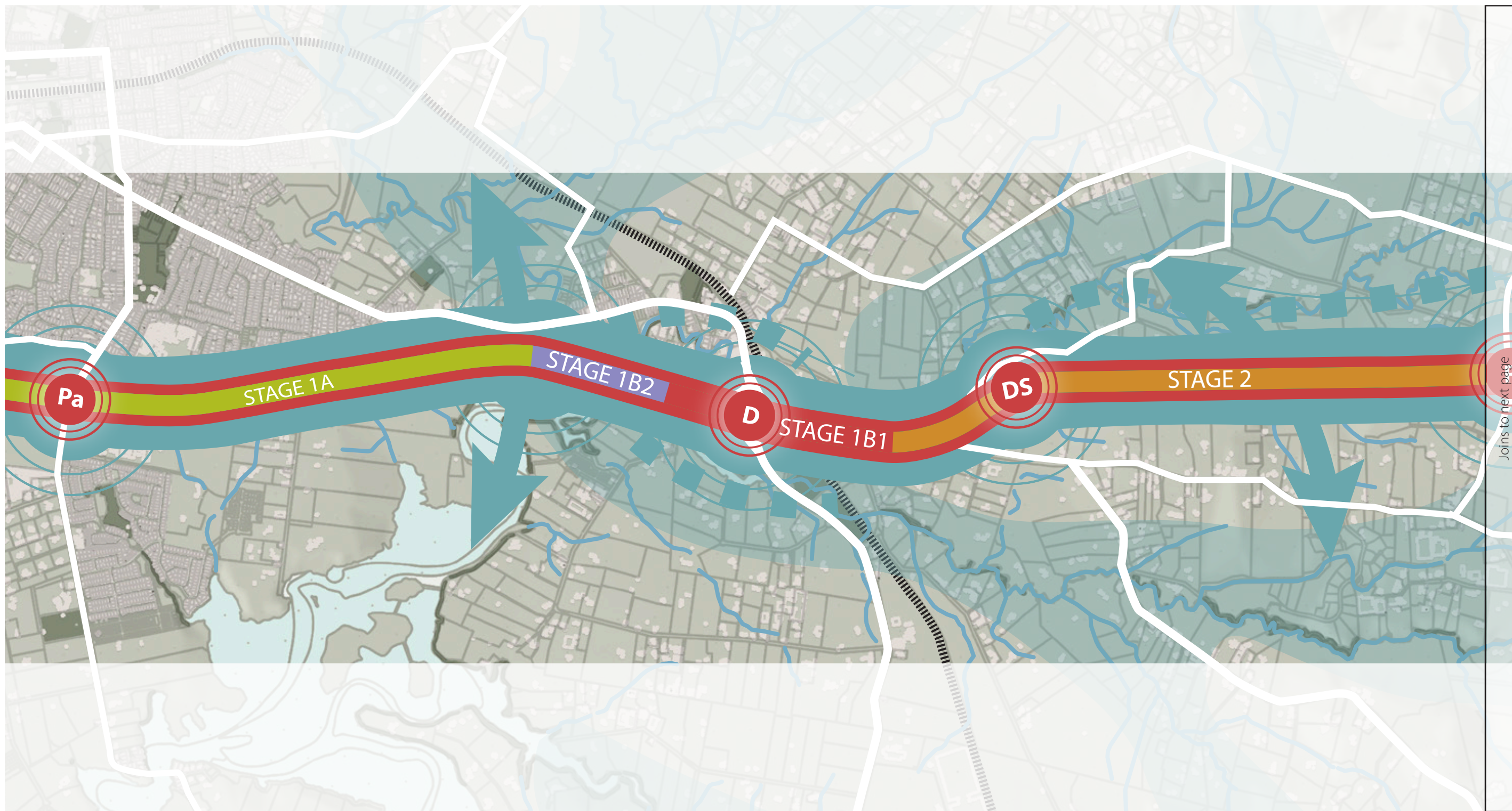
The following methods will be used to achieve this vision:

- Retaining and enhancing native vegetation where possible;
- Retaining and buffering natural watercourses;
- Using plant species that are resilient to the motorway environment, even if these have to be sourced from beyond the immediate ecological district or region;
- Using a variety of plant species to maximise habitat and biodiversity, avoiding large swathes of single species planting;
- Ensuring that there is a variety of seed sources used for each species, avoiding cloning and enhancing natural diversity;
- Using plants that can provide a natural seed-source and assist with natural regeneration of spaces beyond the motorway corridor; and
- Ensuring high quality maintenance throughout the early stages of growth to maximise plant success and long-term resilience.

In addition, practical design requirements are as follows:

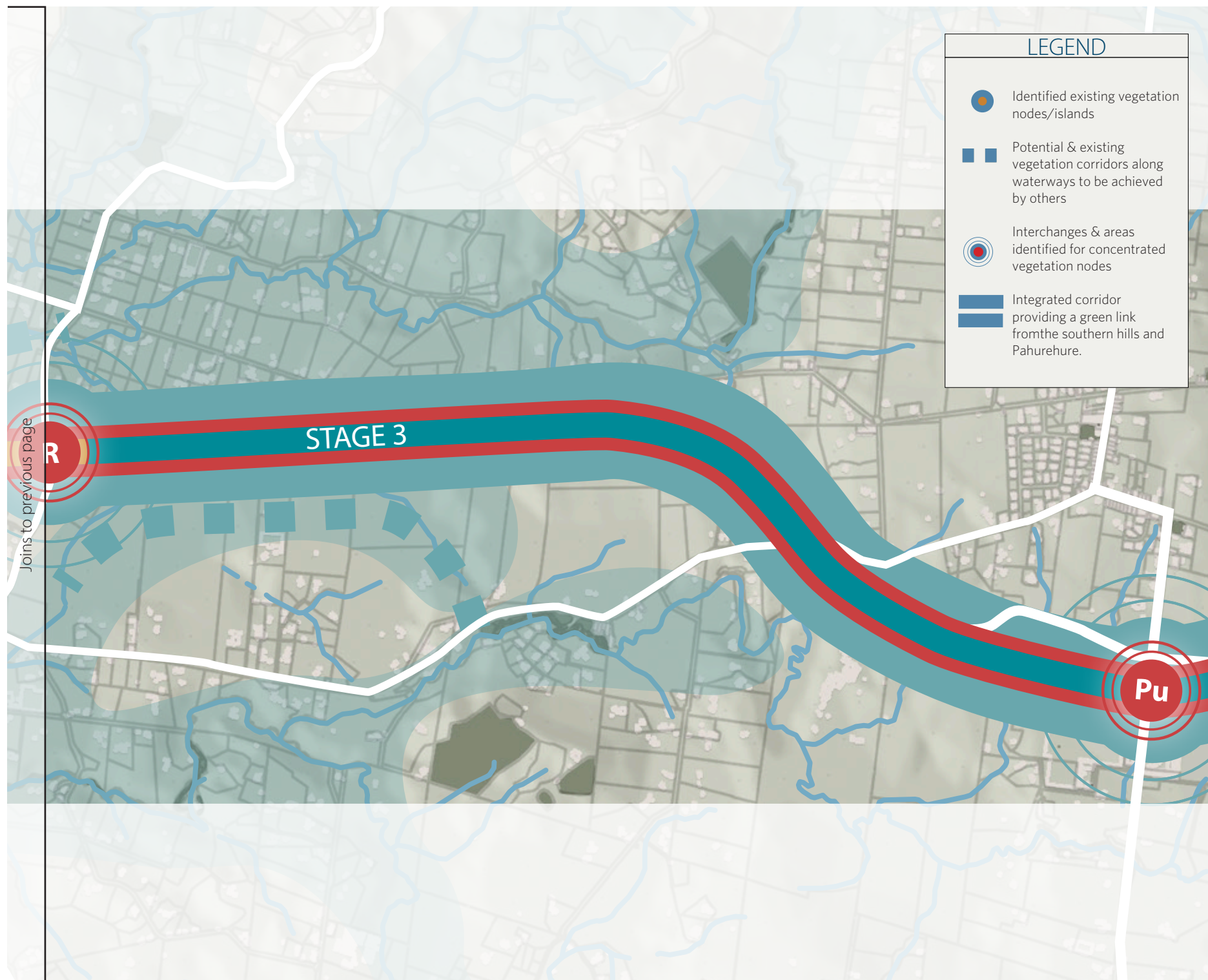
- Elimination of grass areas as much as possible to reduce whole of life costs;
- The use of climbing and screening plants to help soften and integrate motorway structures;
- The use of existing planting standards (including P39 Specification) to ensure best practice methodology;
- Ensuring frangible and drooping plants that do not encroach on the road or SUP; and
- Ensuring that there is adequate space for maintenance access.

Planting plans need to be developed that balance the requirements of the Planting Strategy with the wider urban design and landscape vision, which is to enhance localised features and reflect on historical cultural landscapes.



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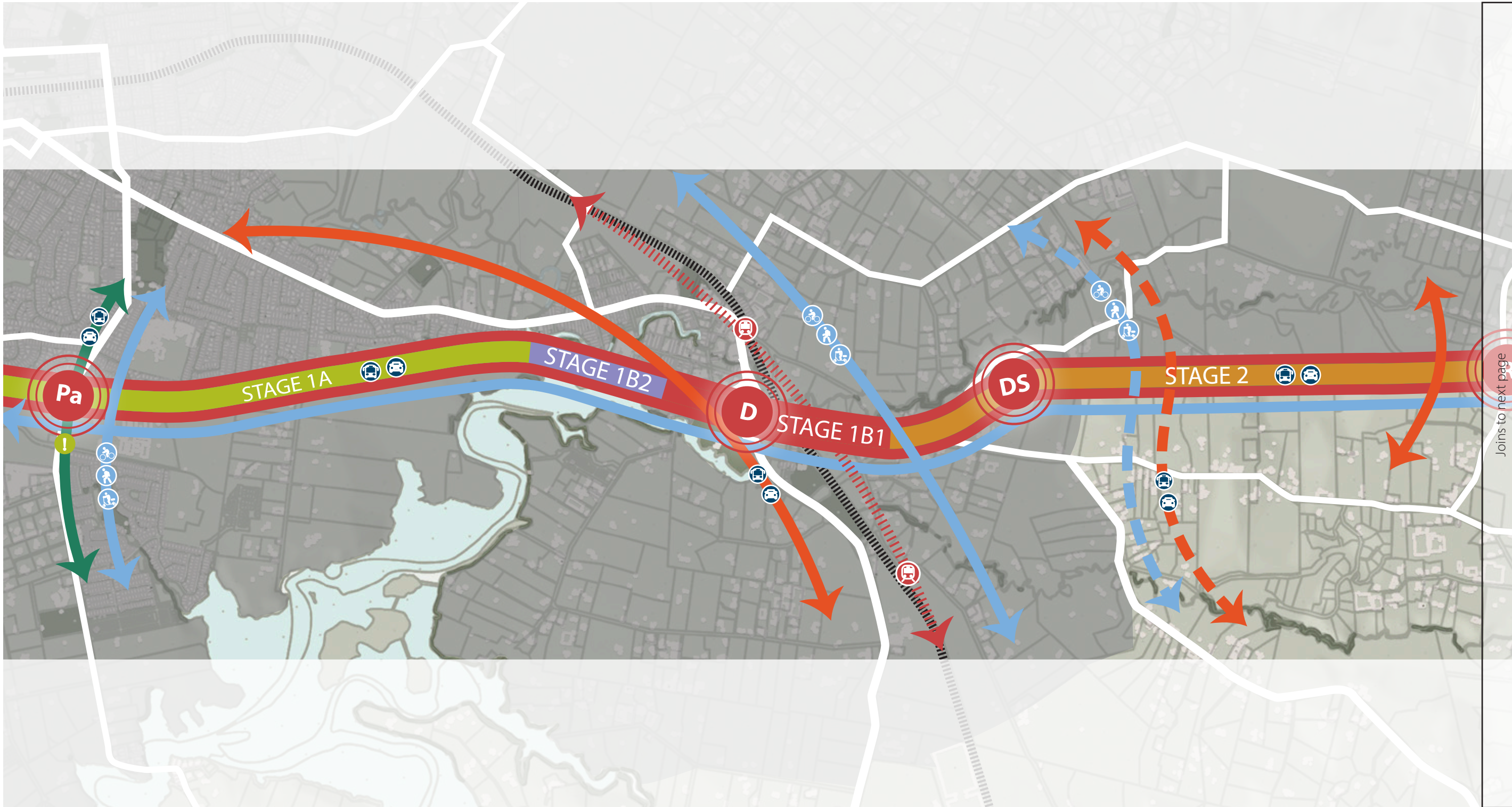
C4: STORMWATER STRATEGY



The design vision for stormwater management is to retain and treat 100% of road surface discharge (including existing and new road surfaces) to exceed the Auckland Council guidelines for Stormwater Management.

The following methods will be used to achieve this vision:

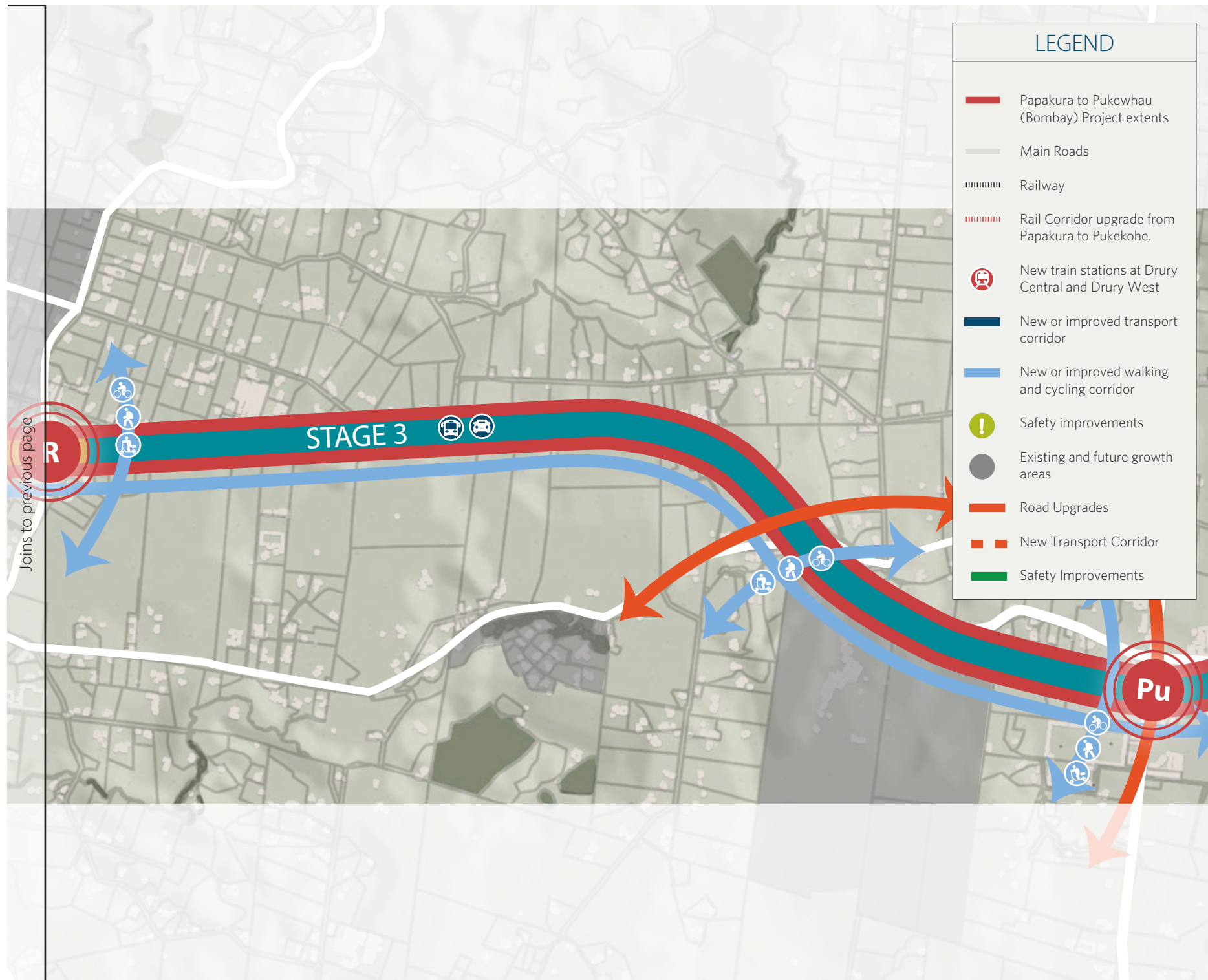
- Planting of swales with native vegetation to eliminate mowing, and to allow steeper embankments (noting maximum ideal gradients of 1V:3H);
- Planting of swales with native vegetation to improve filtration of stormwater flows;
- Application of biodegradable erosion control materials, avoiding the use of plastic-based (or infused) materials that might find their way into waterways;
- Enhancement of stream environments through the application of treatment trains;
- Enhancement of stream corridors through riparian planting;
- Naturalisation of the flow of water by contouring to more natural slopes (where space allows);
- Any discharge point 'naturalised' using rock rip rap;
- Planting of filter strips should graduate from grasses, to sedges and into taller vegetation to filter sediments and enhance soil development;
- Upgrade of wider Papakura wetland filtration systems where possible and proposed planting schemes to integrate them into the broader landscape, slow water flows and enhance the water treatment process;
- Chamfering and naturalisation of culverts to match the contour of the surrounding landform; and
- Only use proprietary devices when all other best practice approaches have been exhausted.



Joins to next page

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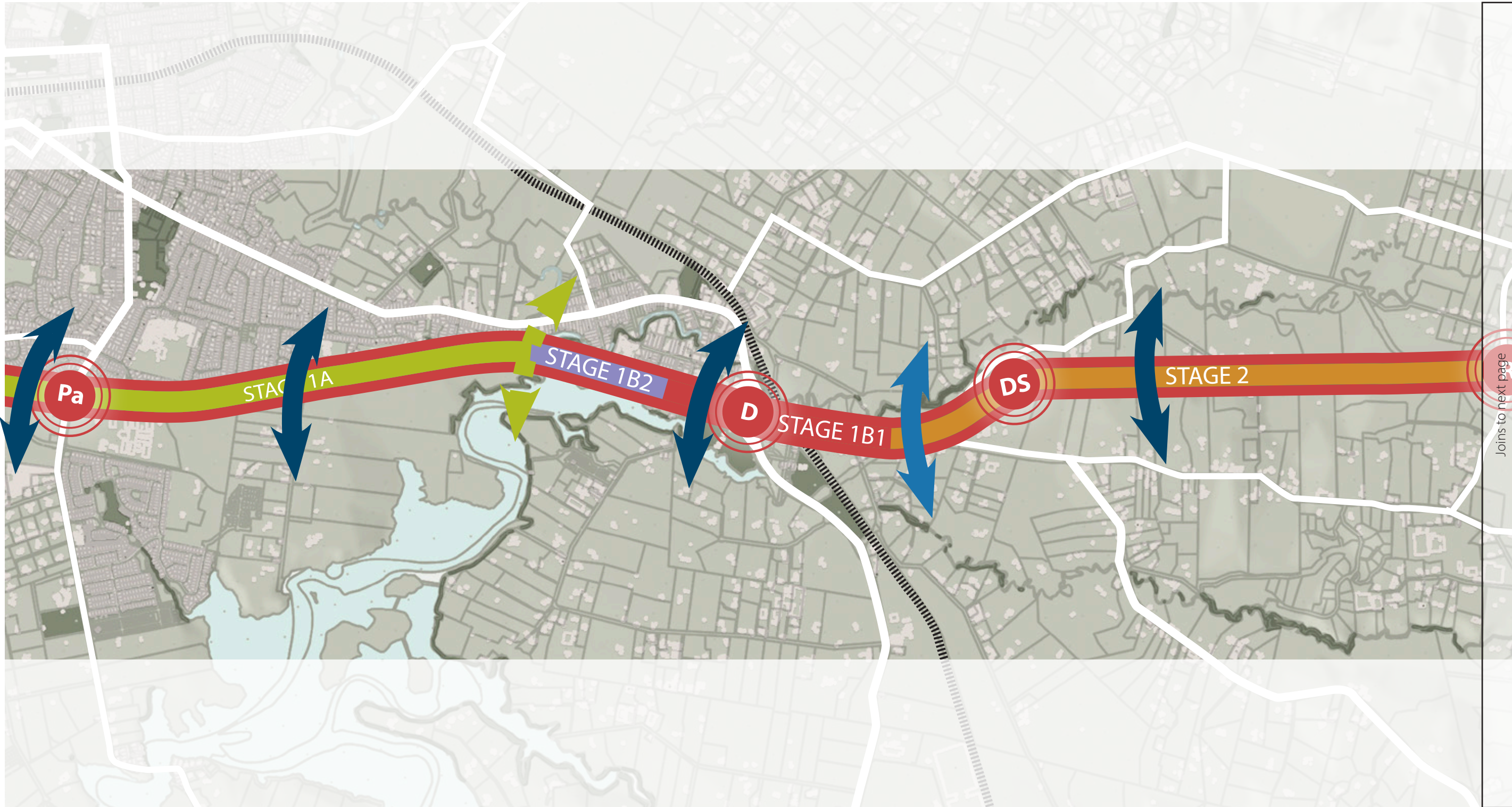
C5: MULTI-MODAL TRANSPORT



The vision for the SUP is to primarily provide a safe environment for users and prevent the unlawful entry from the path to neighbouring properties. Provide an opportunity for interpretation, artwork, and wayfinding reflecting the korero provided by iwi and using both Te Reo Māori and English.

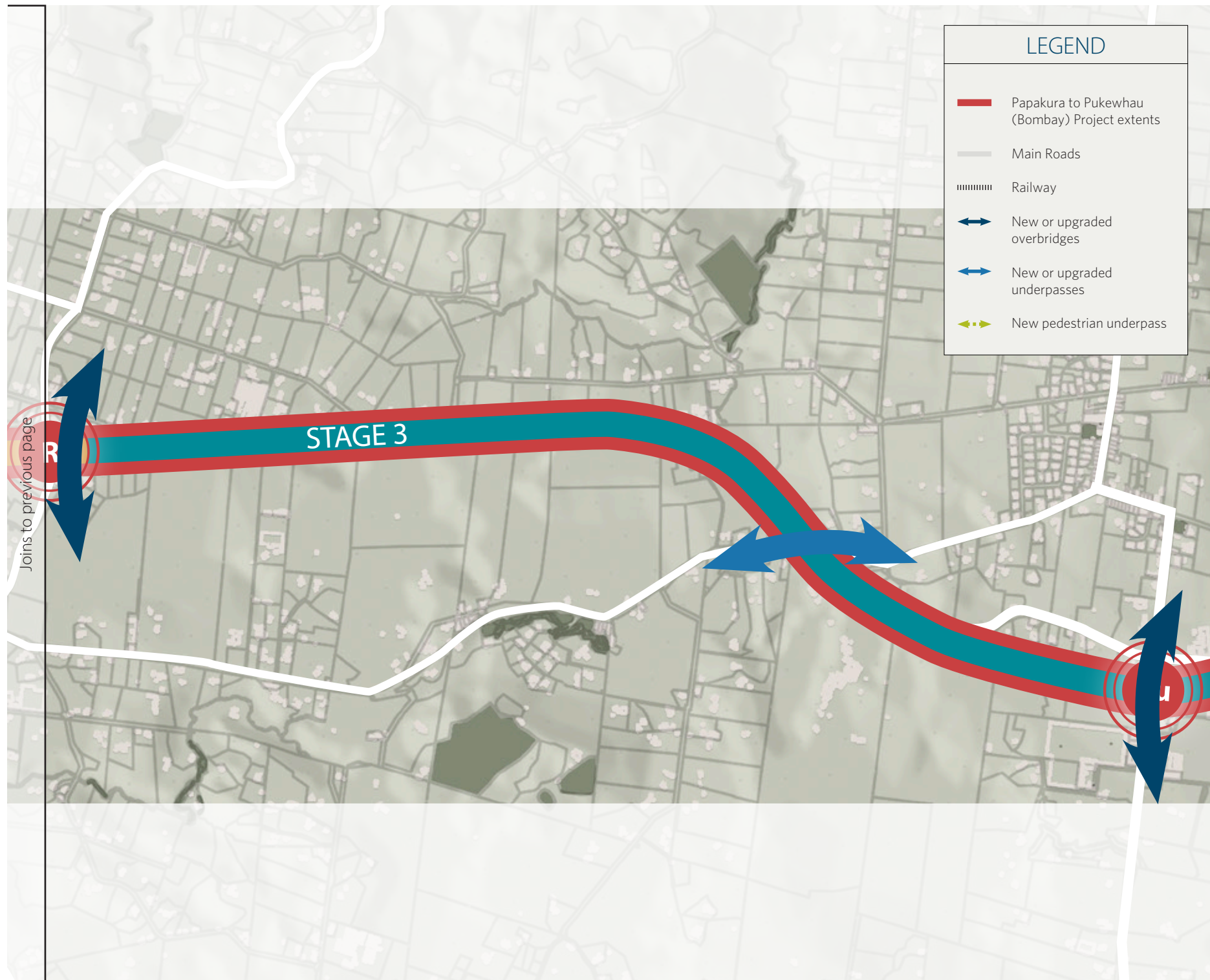
The vision will be achieved through the following methods:

- Finish the path with a high quality surface;
- In all 'T' intersections, include safety devices such as chicanes;
- Provide ground wayfinding signage;
- Provide signage for all local and regional connections;
- Undertake a lighting assessment and install lighting where required;
- Where possible, lighting should be incorporated within other infrastructure such as signage, balustrading, path surfaces, seating etc and assist in the narrative;
- Match safety fences to SUP fences;
- Design with CPTED Principles to reduce security risks and increase safety;
- Where possible balustrades and fencing will be provided along both sides of the shared path;
- Fencing will be visually permeable, 1.8m high and recessive in colour and design;
- Opportunities to set the barrier back from the SUP should be taken and vegetation can help mitigate its appearance; and
- Seating areas, lighting and artwork (if any) can all reference the korero and result in high quality urban design outcomes.



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C6: OVERBRIDGES & UNDERPASSES STRATEGY



The design vision for overbridges and underpasses is to ensure each overbridge is considered in the context of the wider corridor, which will include other bridges and structures outside of the project area (such as Te Mara o Hine at Pescara Point), and sequentially reference the overall urban design vision to reflect on historical cultural landscapes and narratives.

At the same time, each overbridge or underpass needs to be considered for its significance in terms of providing a navigatable route across the corridor, linking the east to the west. Each structure needs to enhance the users crossing the motorway, bringing them into the overall corridor narrative.

The designs for the bridges need to be legible and clear, so that the narratives aren't lost in the engineering detail.

Equally, the structures need to have longevity. They need to be designed for the future environment, with built in capacity, whilst being safe to navigate over or through. They need to prevent vandalism and graffiti, and discourage people from lingering around them.

The vision will be achieved through the following methods:

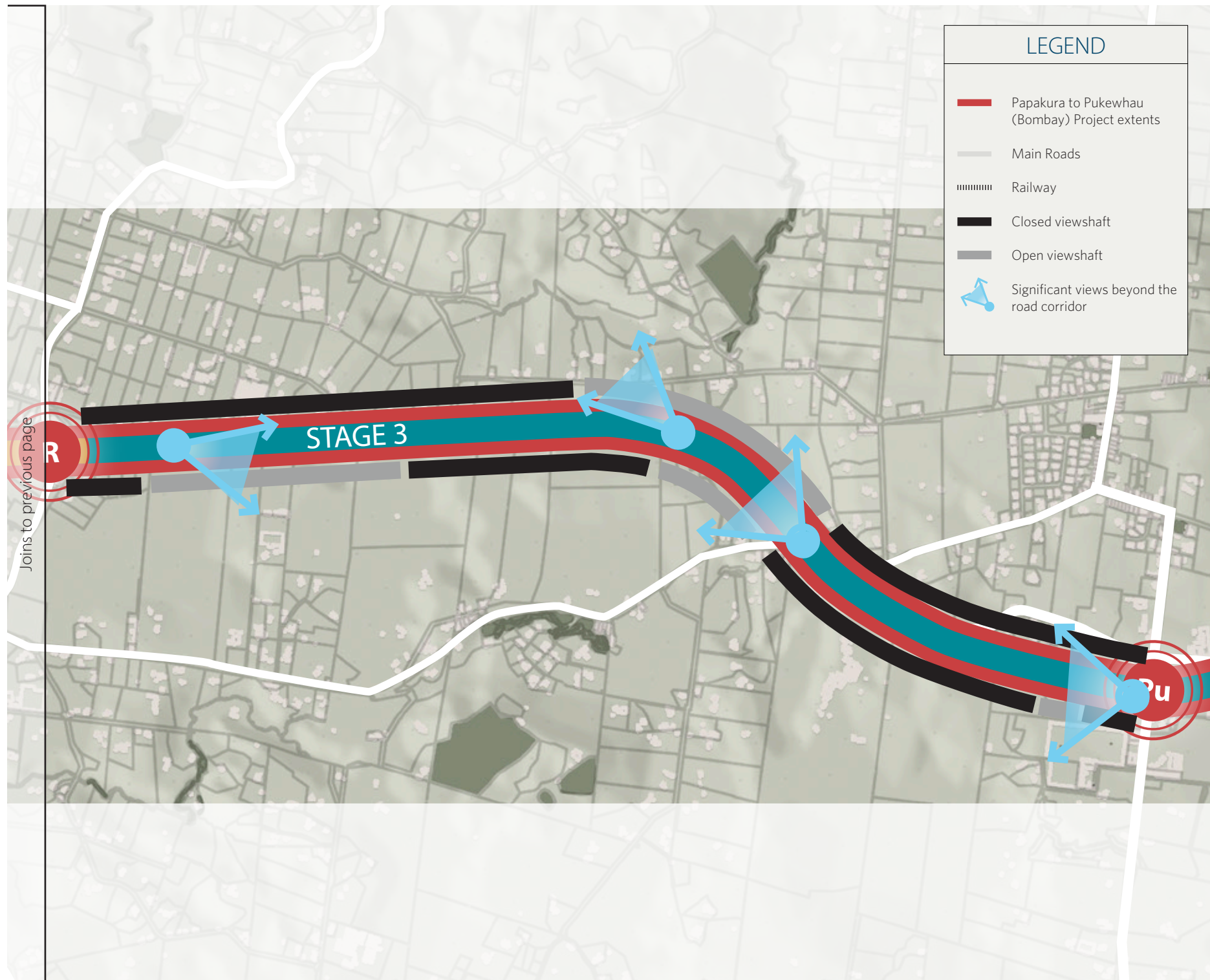
- Using this framework to identify appropriate design responses for each bridge;
- Use a consistent, logical and well defined architectural style across all bridges in the project;
- Consider the form and proportion of the bridge to minimise the bridge profile, and ensure the bridge is of a scale that relates to people and vehicles that cross over or under it;
- Utilisation of colour, material and texture to assist with visual amenity;
- Giving consideration to both the 'over bridge' and 'under bridge' experience - how will people experience the bridge at different speeds and at different proximities;
- Keeping the design simple - don't over-complicate with detailed textures or colouring;
- Ensuring that any themes or designs are incorporated into the design of the bridge itself, rather than being 'bolt-on' adornments;
- For open abutments, considering the under bridge treatments i.e. rough rock surfacing or kowhaiwhai pattern brickwork;
- Extending the bridge barrier back to provide a strong form to the bridge; and
- Ensuring spaces beneath bridges are safe, do not attract graffiti and can be easily maintained.

To help achieve the overbridge design vision, Mana Whenua have indicated their willingness to assist in developing narratives and artistic concepts that can be incorporated into the bridge design.



See next page for legend

C7: NOISE & VISUAL MITIGATION



The vision will be achieved through the following methods:

- Seamlessly tie into noise barriers constructed within the neighbouring Southern Corridor;
- Use a colour palette that reflects the local area;
- Ideally the height of the noise barriers should follow the landform to create a continuous line.;
- Ensure there is a minimum of 3 panel spans before a change in the direction of height;
- Where a vertical structure is used to extend the height or provide screening ensure any vertical elements are aligned with the vertical elements on the wall;
- Where a noise barrier is on top of a retaining wall, ensure that the transition between the two structures is seamless so they appear as a single structure;
- Retaining walls should be designed to ensure that maintenance access can be provided and graffiti protection is in place; and
- In some places noise walls can be extended beyond the acoustic engineering minimum mitigation to ensure consistency of design.

VIEWSHAFTS

- Expansive view opportunities;
- Elevated locations; and
- Variation between open and closed road corridors.

C8: OTHER ELEMENTS



CPTED

Crime Prevention through Environmental Design (CPTED) is a tool for developing the ULDF to enhance the users experience and comfort of the environment.

Principles include:

- Surveillance - good design will provide opportunities for informal surveillance.
- Natural access control - physical design that attracts people to some places and restricts them from others.
- Territorial reinforcement - is installed by features that define property lines and distinguish private spaces from public spaces such as landscape plantings, pavement designs, entranceway treatments, and low fences.
- Quality environment and space management - Vandalism can be reduced by the use of sturdy materials, and speedy and careful maintenance and repair.

Qualities that should be considered are:

- Safe Access
- Surveillance and Lighting
- Layout
- Activity Mix
- Sense of Ownership
- Quality Environments
- Physical Protection

