



# Warkworth to Wellsford

Urban & Landscape Design Framework Planning Version

June 2019

### Document Quality Assurance

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View from Viv Davie-Martin Drive looking north towards the Dome and the Matariki Forest

An aerial topographic map of a coastal region, likely in the United States. The map shows a large body of water on the right side, with several smaller bodies of water and inlets. The land is mostly green, indicating forested areas, with some brownish areas suggesting higher elevations or cleared land. A network of roads and highways is visible across the land. The title "1. Introduction" is written in white text in the upper right quadrant of the map.

# 1. Introduction

## 1.1 Purpose

As part of the Ara Tūhono (connecting pathway), Boffa Miskell has prepared this Planning Version Urban and Landscape Design Framework (ULDF) for the New Zealand Transport Agency (the Transport Agency), for the Warkworth to Wellsford Project (the Project).

The route is approximately 26 km long, commencing from the interface with the Pūhoi to Warkworth (P-Wk) project near Woodcocks Road, passing to the west of the existing SH1 alignment near The Dome before crossing SH1 just south of the Hōteu River and then bypassing Wellsford and Te Hana to the east.

The Project ends to the north of Te Hana where a connection will be provided to the existing SH1 just north of a new bridge at the Maeneene Stream and realigned Maeneene Road.

The Transport Agency requires ULDFs to be prepared for major projects as part of the Transport Agency's commitment to high quality urban and landscape design outcomes, "to ensure that the urban and landscape design concepts are appropriately defined, developed and implemented" [Bridging the Gap, p.114]<sup>1</sup> to show how the projects are integrated into the surrounding environment. ULDF's are a tool to assist with developing and presenting a holistic approach to landscape, ecological, cultural and urban design outcomes.

The nature and purpose of this Planning Version ULDF is illustrative only. It sets out the urban design and landscape principles that will guide the design development of the Project such that it can be integrated into the landscape, and appropriately mitigate adverse effects.

The stages of the ULDF are described in section 1.3. This Planning Version ULDF has been prepared to support the Project Notice of Requirement, applications for resource consents, and for public engagement. It defines principles, landscape context and a vision for the project and references key guiding documents.

This ULDF for the Warkworth to Wellsford section of Ara Tūhono reflects a corridor approach and draws on the ULDF for the Pūhoi to Warkworth section.<sup>2</sup> As such, this ULDF shows a consistent approach between the two projects. This ULDF is an evolving "living document" underpinned by similar principles to the Pūhoi to Warkworth corridor and the Transport Agency Urban Design principles (from "Bridging the Gap" urban and landscape design guidelines section 3.1), and landscape principles (from the Landscape Guidelines).

Subject to approval of the project, including the development of designation and resource consent conditions, this Planning Version ULDF will evolve into a Draft ULDF. The Draft ULDF will then be finalised for procurement of the Project, with its further development involving additional stakeholder engagement building on key design, designation and consenting outcomes for the project.

Implementation of the Project will involve development of a Final ULDF that overlays the preliminary design and project outcomes whilst guiding design development. ULDF Sector Plans will be developed at the detailed design stage and illustrate the final project outcomes.

<sup>1</sup> Refer to NZTA *Bridging the Gap*: <https://www.nzta.govt.nz/resources/bridging-the-gap/>

<sup>2</sup> Refer to Pūhoi to Warkworth ULDF: [www.nzta.govt.nz/projects/ara-tuhono-puhoi-to-warkworth/](http://www.nzta.govt.nz/projects/ara-tuhono-puhoi-to-warkworth/)

As the design progresses, the ULDF will illustrate how the Project is integrated with its rural landscape and cultural context, and exemplify a collaborative approach across the design, environmental and engagement work streams. While it draws on all the technical assessments for the Project, the Planning Version ULDF is intended to support the Landscape and Visual Effects Assessment (LVEA) and the Assessment of Effects on the Environment (AEE) for the project.

## 1.2 The New Zealand Transport Agency Urban and Landscape Design Principles

Urban design involves the arrangement and design of buildings, public spaces, transport systems, services, and amenities. The Transport Agency is committed to planning for, developing and promoting quality urban design as a signatory to the New Zealand Urban Design Protocol.<sup>3</sup>

The Transport Agency urban design guidelines *Bridging the Gap* and *Landscape Guidelines*<sup>4</sup> are the guiding documents that establish the requirements for the development of Urban and Landscape Design Frameworks.

*Bridging the Gap* and the *Landscape Guidelines* are adopted by those responsible for the design and implementation of Transport Agency projects. Both documents require projects to be delivered utilising best practice to achieve positive urban design and landscape outcomes. This Planning Version ULDF draws on both documents as relevant to the project and is to be interpreted in light of those documents.

### 'Bridging the Gap' 10 Urban Design Principles

- Designing for the context
- Integrating transport and land use
- Contributing to good urban form
- Integrating all modes of movement
- Supporting community cohesion
- Maintaining local connectivity
- Respecting cultural heritage values
- Designing with nature
- Creating a positive road user experience
- Achieving a low maintenance design

### 'Landscape Guidelines' 10 Design Principles

- Context sensitive and place based approach
- Facilitate green infrastructure and landscape integration
- Understand the physical conditions
- The right plant in the right place
- Promote biodiversity and build in resilience
- Champion low impact design
- Deliver a quality user experience
- Low maintenance and whole of life value
- Safety in design
- Facilitate community engagement and a collaborative approach

<sup>3</sup> Refer to MFE *New Zealand Urban Design Protocol* <https://www.mfe.govt.nz/sites/default/files/urban-design-protocol-colour.pdf>

<sup>4</sup> Refer to NZTA *Landscape guidelines*: <https://www.nzta.govt.nz/assets/resources/nzta-landscape-guidelines/docs/nzta-landscape-guidelines-20140911.pdf>

### 1.3 The ULDF

A Notice of Requirement and applications for resource consent will be lodged for the Project. This Planning Version ULDF describes outcomes that have informed the development of the Indicative Alignment, and the proposed designation.

This Planning Version of the ULDF has been prepared by a team of qualified landscape architects and urban designers as part of a wider project team including:

- Civil and Structural Engineering
- Planning
- Stormwater
- Ecology
- Cultural
- Archaeology
- Heritage

The document has also taken into account feedback from recent Transport Agency engagement with iwi, advice provided by Hōkai Nuku on the Pūhoi to Warkworth and Warkworth to Wellsford projects, and cultural values and effects assessments provided to date by Hōkai Nuku, Te Kawerau a Maki and Ngāti Maru. Subsequent versions of the ULDF will be prepared in collaboration with mana whenua.

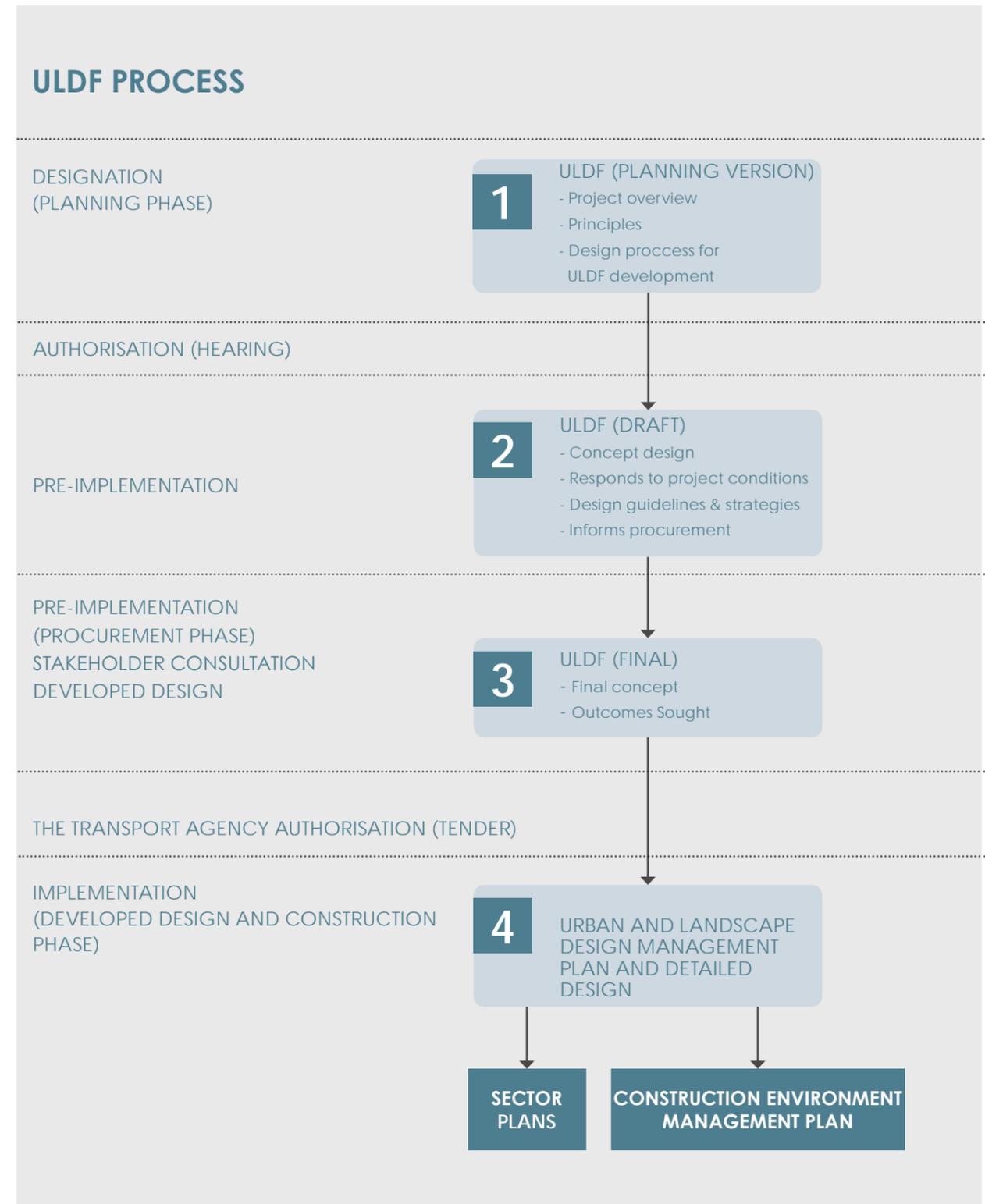
The ULDF is a technical report prepared to demonstrate how the Project will ultimately fulfil the urban design and landscape outcomes sought for the Project, as defined in section 1.2 of this Planning Version ULDF.

The Planning Version ULDF is not intended to provide an assessment of environmental effects of the project from a Resource Management Act (RMA) perspective. Although the ULDF is cognisant of the RMA requirements, its role is to set out principles to guide urban design and landscape. It delivers on the Transport Agency’s social and environmental responsibilities under the Land Transport Management Act (LTMA). The Planning Version ULDF is an indicative document that demonstrates via design principles and examples how the Project will be integrated within the landscape to minimise impact and tie in with the surrounds.

It is intended that the Planning Version of the ULDF be used by:

- Designers in the next phases of the Project: As a reference for the overall scope and design objectives, the identified opportunities and anticipated principles and outcomes sought.
- The Transport Agency: To ensure that the developed design and detailed design prepared in the next phases of the Project are aligned with its various mitigation and management requirements.
- Mana whenua : To help provide designers in the next stage of the Project with a kōrero (narration) on which detailed design can be built, and to ensure that matters relating to matauranga Māori have been achieved.
- Community and stakeholders: To provide feedback with concerns and opportunities through engagement.

- The process of developing further phases of the ULDF is identified in the following diagram.



## 1.4 Consultation, Public Engagement, and Project Partners

This Planning Version ULDF has been developed with consultative input from iwi and contains high level design principles and cultural values that were developed with Hōkai Nuku for the Pūhoi to Warkworth project. Hōkai Nuku is the authorised voice of four iwi and Hapū mana whenua – Ngāti Manuhiri, Ngāti Mauku/Ngāti Kauae of Te Uri o Hau, Ngāti Rango of Kaipara and Ngāti Whātua. Hōkai Nuku was initially formed in 2010 to collaborate on the New Zealand Transport Agency Project – Ara Tūhono Pūhoi to Wellsford and has been contracted by the Transport Agency to provide specialist advice for the project.

Mana whenua will continue to have consultative input to the development of future versions of the ULDF as the design is developed. Consultation with key stakeholders and the general public will also inform future versions of the ULDF.

## 1.5 Background Documents

A number of documents will inform the ongoing urban and landscape design process.

Background documents that emphasise the Transport Agency's (and its consultants') responsibility to address or consider social and environmental factors are:

- **New Zealand Urban Design Protocol (1999):** Provides a conceptual platform of urban design values to create safe, well connected, accessible and inclusive places.  
[www.mfe.govt.nz/sites/default/files/urban-design-protocol-colour.pdf](http://www.mfe.govt.nz/sites/default/files/urban-design-protocol-colour.pdf)
- **Resource Management Act (1991).**
- **Land Transport Management Act (2003, reprint as October 2017):** requires the Transport Agency to 'exhibit a sense of social and environmental responsibility' in meeting the statutory objective of operating a state highway network.
- **New Zealand Transport Agency Environmental Plan (2008):** specifies how the Transport Agency's staff and suppliers are expected to address key social and environmental effects. Relevant objectives include:
  - Social responsibility: To enhance and contribute to community cohesion.
  - Culture and heritage: To proactively limit the disturbance of significant cultural and heritage features along State highways. To show respect for historic buildings we own to maintain their integrity.
  - Visual quality: To incorporate multi-purpose landscaping as an integral part of all new State highway construction projects. To improve the visual quality of the existing State highway network.
- **New Zealand Transport Agency Environmental and Social Responsibility Standard (Z19) (2016):** requires consultants engaged on highway projects to consider social and environmental factors

identified in legislation and the Transport Agency's policies and guidelines.

<https://www.nzta.govt.nz/roads-and-rail/highways-information-portal/technical-disciplines/environment-and-social-responsibility/national-standards-guidelines-and-specifications/esr-standard>

- **Bridging the Gap: NZTA Urban Design Guidelines (2013):** The Guidelines set out 10 over-arching urban design principles, and guidance on specific elements of highways including bridges, retaining walls, earthworks, noise barriers, highway furniture, stormwater management devices, signalised junctions, roundabouts, tunnels, stopping places, landscape planting and public art.  
[www.nzta.govt.nz/resources/bridging-the-gap/](http://www.nzta.govt.nz/resources/bridging-the-gap/)
- **New Zealand Transport Agency Landscape Guidelines (Final Draft) (2014):** The Guidelines similarly set out 10 over-arching principles, and guidance on (1) design considerations (including safety and extent of landscaping), (2) landscape treatments (including topsoil, planting, and storm water) and (3) maintenance requirements.  
[www.nzta.govt.nz/resources/nzta-landscape-guidelines/](http://www.nzta.govt.nz/resources/nzta-landscape-guidelines/)
- **New Zealand Transport Agency P39: The Standard Specification for Highway Landscape Treatments:** which sets out minimum standards, covering such matters as site preparation; quality control, inspections and reporting; plant and animal pest control; plant propagation; topsoil supply; planting; grass; hydro-seeding and specialist treatments; irrigation and maintenance.  
[www.nzta.govt.nz/resources/landscape-treatments/](http://www.nzta.govt.nz/resources/landscape-treatments/)
- **Bridge Manual, New Zealand Transport Agency (Third edition, 2016):** Section 2.6 Urban Design refers to Aesthetics/Functions, urban design assessment for bridges and major retaining walls, appearance and an urban design bridge assessment matrix.  
[www.nzta.govt.nz/resources/bridge-manual/bridge-manual.html](http://www.nzta.govt.nz/resources/bridge-manual/bridge-manual.html)
- **Highways Agency (1996) The appearance of bridges and other highway structures. HMSO, London, United Kingdom.**



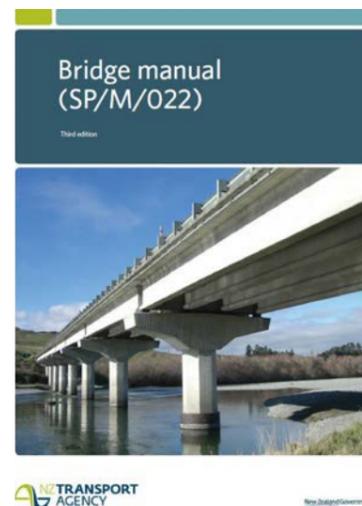
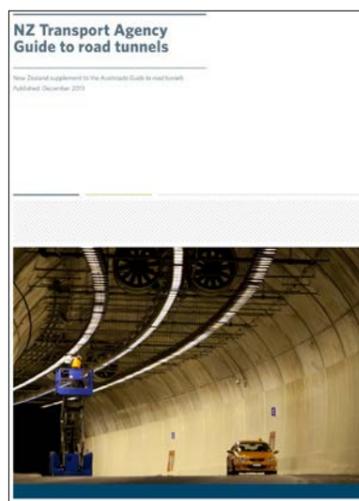
- **NSW Roads and Maritime Services Bridge aesthetics: Design guideline to improve the appearance of bridges in NSW.**
- **Fédération Internationale du Béton Guidance for good bridge design.**
- **Other Standards:**
  - ‘Safe System’ approach to highway design which forms part of the Transport Agency commitment to the ‘Safer Journeys Strategy.’  
[www.saferjourneys.govt.nz/about-safer-journeys/the-safe-systemapproach/](http://www.saferjourneys.govt.nz/about-safer-journeys/the-safe-systemapproach/)
  - Guide to Road Tunnels.  
<https://www.nzta.govt.nz/assets/resources/guide-to-road-tunnels/docs/guide-to-road-tunnels.pdf>

- **Te Aranga principles, Auckland Design Manual (2013):** The Te Aranga principles were developed by Auckland Council in collaboration with iwi and constitute a Te Aranga Framework whose key purpose is to ensure the protection, reinstatement and reaffirmation of iwi who have the authority as mana whenua to define connection and association to the cultural landscape through design, so that all parties have the opportunity to connect and to deepen their appreciation and knowledge of the history of the area.
- Te Aranga principles are underpinned by the high level values of rangatiratanga, kotahitanga, kaitiakitanga, whanaungatanga, manaakitanga, mātauranga and wairuatanga. Given the significant cultural values that exist through the Project area, the ongoing design process should continue to give regard to the Te Aranga principles and engage with iwi as active design collaborators, so that Mātauranga Māori can complement and improve the urban design outcomes.

## 1.6 Further Planning and Design Considerations

The following matters are recommended as future considerations to be addressed during the development of the draft and final ULDF:

- Expressing the cultural values of mana whenua.
- Integration of the Project with the surrounding landscape and topography, having regard to local landscape character and context along the highway route.
- Integration of the urban and landscape design matters with other disciplines including civil and structural engineering, ecology, stormwater, earthworks, as well as tunnel, bridge architecture and retaining walls.





View looking East along Wayby Station Road

A topographic map of a coastal region, likely in the United States, showing terrain, roads, and water bodies. The map is oriented with the coastline on the right side. The terrain is depicted with various shades of green and brown, indicating elevation. A network of roads is shown in light gray. Several towns or cities are visible, with the largest one located in the lower right quadrant. A prominent river or waterway flows from the top left towards the center. The text "2. Context" is overlaid in the upper right corner in a white, sans-serif font.

## 2. Context

## 2.1 Natural History

This section of the ULDF describes the natural landscape context of the Project. It describes the main landscape features, rivers, catchments and Outstanding Natural Landscapes (ONL's) in the Auckland Unitary Plan Operative in Part (AUP(OP))<sup>5</sup> in the wider project area.

The Mahurangi River Left Branch flows in a westerly direction through the southern end of the Project area. It then meanders south through Warkworth to the Mahurangi Harbour. Carran Road traces, more or less, the subtle watershed between the Mahurangi River (Warkworth catchment) that drains to the east coast and the Kōurawhero Stream (Lower Hōteō catchment) that flows to the Hoteo River which drains to the Kaipara Harbour.

The Project is within the Rodney ecological district, so the original vegetation cover would have historically been mainly northern broadleaf and podocarp forest, with stands of kauri. The kauri was logged during the nineteenth century and most of the indigenous forest cover was replaced with pasture or plantation forest. Remnant areas of indigenous vegetation remain.

Much of the indigenous vegetation is regenerating kānuka and mānuka, with some larger areas of mature bush including The Dome Valley Forest east of SH1 (a noteworthy forest remnant in the vicinity of the Project is Logues Bush 2km north-east of Waiteitei). Remnant totara forest is a characteristic feature of the more rolling country area, often as isolated stands in pasture, or as ribbons tracing the streams and rivers.

The following landscape features are classified as 'Outstanding Natural Features' (ONF) in the (AUP(OP)):

- Hōteō River (ONF 49) incised meanders – “a deeply incised meandering gorge through some 30km of broken hill country” (the upstream end of the ONF is approximately 250m west of existing SH1, outside the proposed designation).

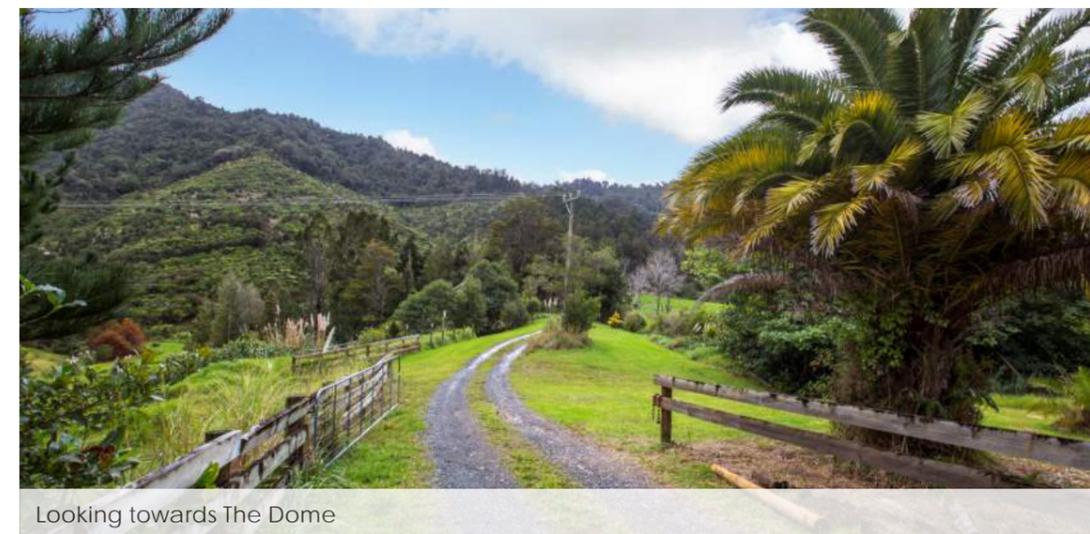
The following areas are classified as 'Outstanding Natural Landscapes' (ONL) in the AUP(OP):

- Dome Forest (ONL32) – “an area of steep bush clad hill faces and ridges within The Dome range. While it is centred on Dome Valley Forest Stewardship Area and Sunnybrook Scenic Reserve”, the ONL extends beyond these reserves to encompass most of the hill faces on the east side of SH1 through The Dome Valley Forest, and the northern skyline from Warkworth.
- North Te Hana – Tomarata Road (ONL23) – “a sequence of inland ridges and gullies with pockets of Tōtara-dominant bush”. The area is mostly east of Ryan Road on the fringes of the corridor.
- Pakiri Foothills (ONL 25) – “an extensive sequence of hills and ridges that forms the backdrop to Waiteitei” east of the Project.

<sup>5</sup> Outstanding Natural Landscapes in Auckland Unitary Plan Operative in Part.



Mahurangi River in Warkworth township



Looking towards The Dome



Kayaking down the Hōteō River

The Dome Valley Forest contains extensive plantation forests (mainly radiata pine), but there are also ONL areas which contain substantial areas of indigenous bush east of SH1. The Dome Valley Forest is consequently sparsely settled, with most of the handful of houses located along the existing highway.

The area north of The Dome Valley Forest in the vicinity of Wellsford, by contrast, is a settled landscape of rolling farmland. This area is founded on Northland Allochthon rock, a 'chaotic' mix of softer rock ranging from muddy limestone to calcareous mudstone and siltstone. The valleys consist of alluvial material in floodplains. The more erodible hills in this area have a softer and somewhat hummocky appearance. This area is mostly used for pastoral farming, particularly dairying, with some orcharding near Te Hana.

The short section of the project corridor south of The Dome Valley Forest also traverses rolling country founded predominantly on Alluvium, thought to sit above Pakiri formation and the flood plains of the streams flowing off The Dome Valley Forest. This area, on the northern outskirts of Warkworth, is likewise used for pastoral farming including dairying, but it also contains horticultural properties including large commercial glasshouses and lifestyle properties.

Most of the Project falls within the catchment of the Hōteō River. Its headwaters are in the farmland far east of Wellsford, but the river cuts through The Dome Valley Forest in deep meandering gorges to its mouth on the Kaipara Harbour in the west. The Hōteō catchment is Auckland's largest catchment (405km<sup>2</sup>). The main stem of the river is 28km in length.

It appears that the river is 'antecedent', that is, it has managed to keep to its course as the topography has changed around it. One of the river's tributaries, the Kōurawhero Stream, traces the southern toe of The Dome Valley Range so that the Hōteō River collects rainfall from both the north and south sides of The Dome Valley Range. A significant section of the river is identified as an ONF, ONF 49 (AUP(OP)).

The Mahurangi River Left Branch is the other notable river, although only a small part of the Project area is located within its catchment. That river flows south to Warkworth and the Mahurangi Harbour.

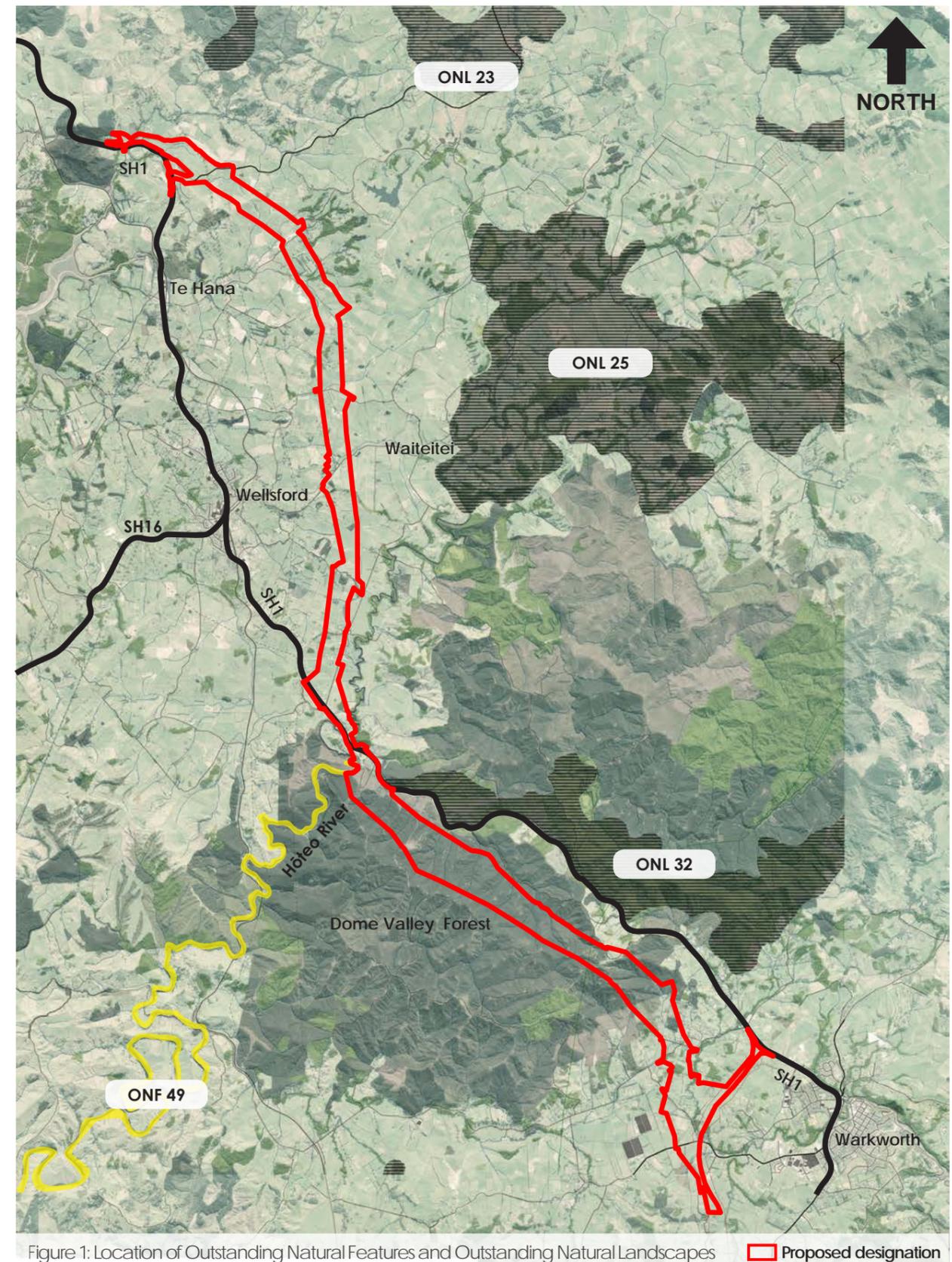


Figure 1: Location of Outstanding Natural Features and Outstanding Natural Landscapes ▭ Proposed designation

## 2.2 Human History<sup>6</sup>

The locations of settlement in both pre- and post-contact Māori and early European times were around Warkworth and coastal Wellsford, due to their location on navigable waterways.

The Kaipara and Mahurangi areas have a long history of Māori occupation. Several tribes and sub-tribes claim, hold or have affiliation with these areas.

The traditional Māori settlement pattern in the Kaipara and Mahurangi districts involved seasonal movement between kainga (villages). The east and west coasts provided abundant marine resources, while the inland forest supplied hunting and resource gathering opportunities. Rivers such as Hōteō and Mahurangi supplied plentiful fresh water, and sandy soils near coastal areas were highly suited to kumara cultivation.

At various periods there was competition between tribes for important resources, such as food sources and fishing grounds. This competition led to a protracted conflict between the Te Kawerau and Hauraki tribes in the 1700s. Further wars took place in the 1820s and 1830s when raiding Ngāpuhi from the north attacked the tribal territories of Ngāti Whatua. Māori of the Kaipara and Mahurangi fled the invasion, leaving the region deserted for several years. By the late 1830s small numbers of Ngāti Whatua and Te Kawerau/Ngāti Rongo Māori began to return to their traditional occupation areas in the Kaipara and Mahurangi.

The first Europeans visited the area in the early 1830s and the purchase of land from its Māori owners by the Crown was negotiated between 1841 and 1853 (the Mahurangi Purchase). Early European settlements were established at Warkworth from the 1850s and Wellsford from the 1860s.

The inland Hōteō Block was negotiated in 1868 between the Crown and some of the Māori owners, and land was offered up to settlers shortly afterwards.

US Military Camps were located in Warkworth during World War II and some of the sites are within the Project area. The historic centre of Warkworth and its heritage buildings are located outside the Project proposed designation.

Wellsford was founded by the Albertlanders with 'Old Wellsford' located near Port Albert, and 'New Wellsford' located further inland in the 1880s. Industry in the area was driven by timber and the gum trade, with dairy farming the main form of industry from 1900.

<sup>6</sup> Source: Warkworth to Wellsford Historic Heritage Assessment.

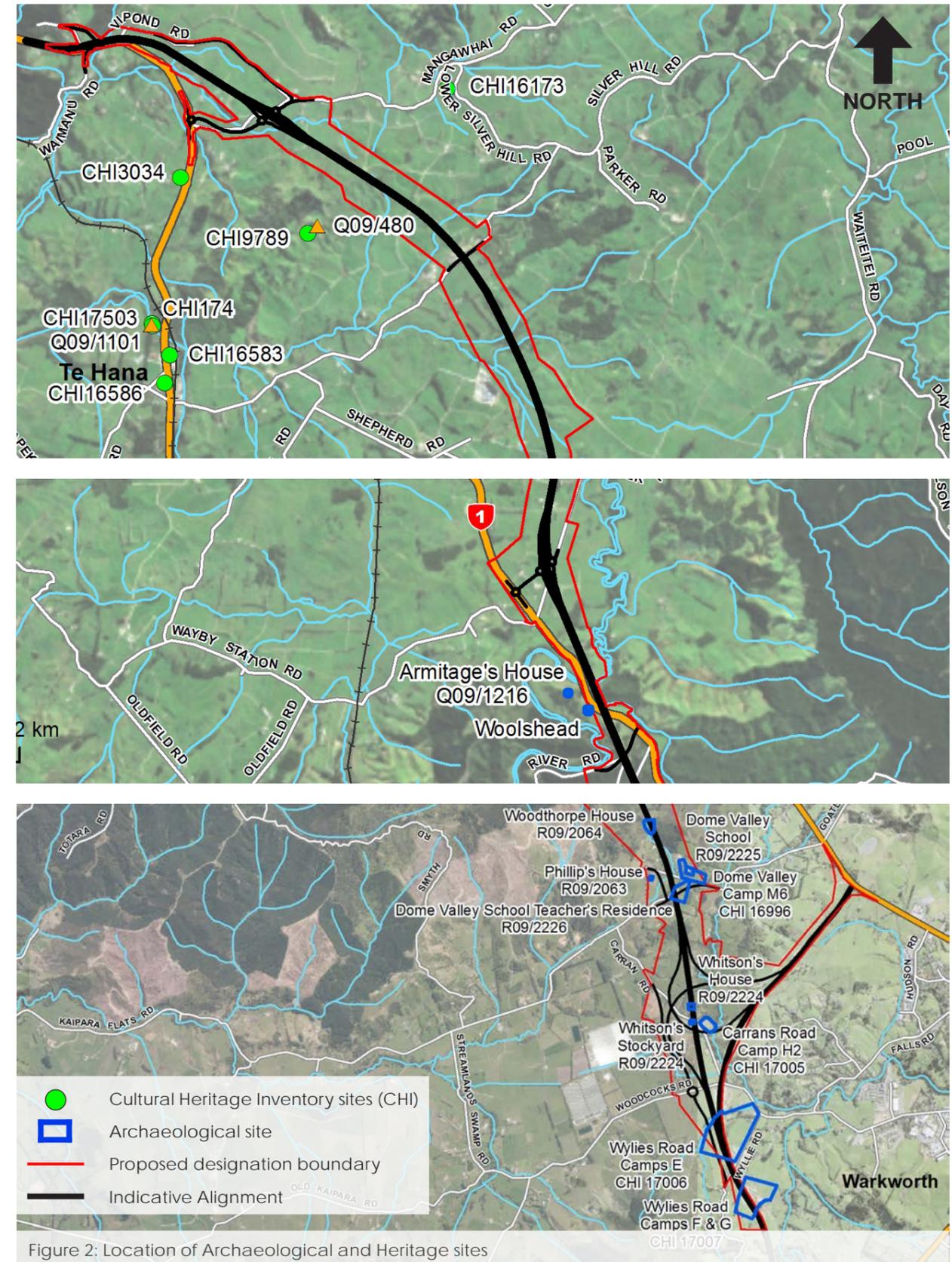


Figure 2: Location of Archaeological and Heritage sites

### Warkworth Outskirts

The Warkworth to Wellsford section of Ara Tūhono will begin north of Warkworth, around the town's rural fringes and lifestyle properties. The large-lot residential area at Viv Davie-Martin Drive (which is outside of the Project area), overlooks the northern end of the Pūhoi to Warkworth State Highway currently under construction. The location where the Proposed designation crosses the Dome Valley Forest skyline is also part of the northern outlook from the town, as well as the distinctive skyline peaks of The Dome and Kraack Hill.

Although it has a history as a rural service town, Warkworth is now growing quickly because of its lifestyle attributes. It is within commuting reach of Auckland, and has been earmarked for significant growth in the AUP(OP).

Warkworth is discussed in further detail in the Pūhoi to Warkworth ULDF. The town was founded at the limit of navigation on the Mahurangi River, and its early development was underpinned by timber felling, a flour mill, cement works, boat building, farming and orcharding. In recent times its hinterland has grown to include the lifestyle attractions of Matakana, coastal settlements at Omaha and Snells Beach/Algies Bay, and lifestyle properties in the surrounding countryside.

We have prepared a Warkworth urban morphology and connection figure to illustrate how Ara Tūhono provides a physical boundary defining one side of the Rural Urban Boundary.

The land through which the proposed designation passes (Woodcocks Road to Kaipara Flats Road), consists of a mix of larger forms, horticulture and smaller scale lifestyle blocks.

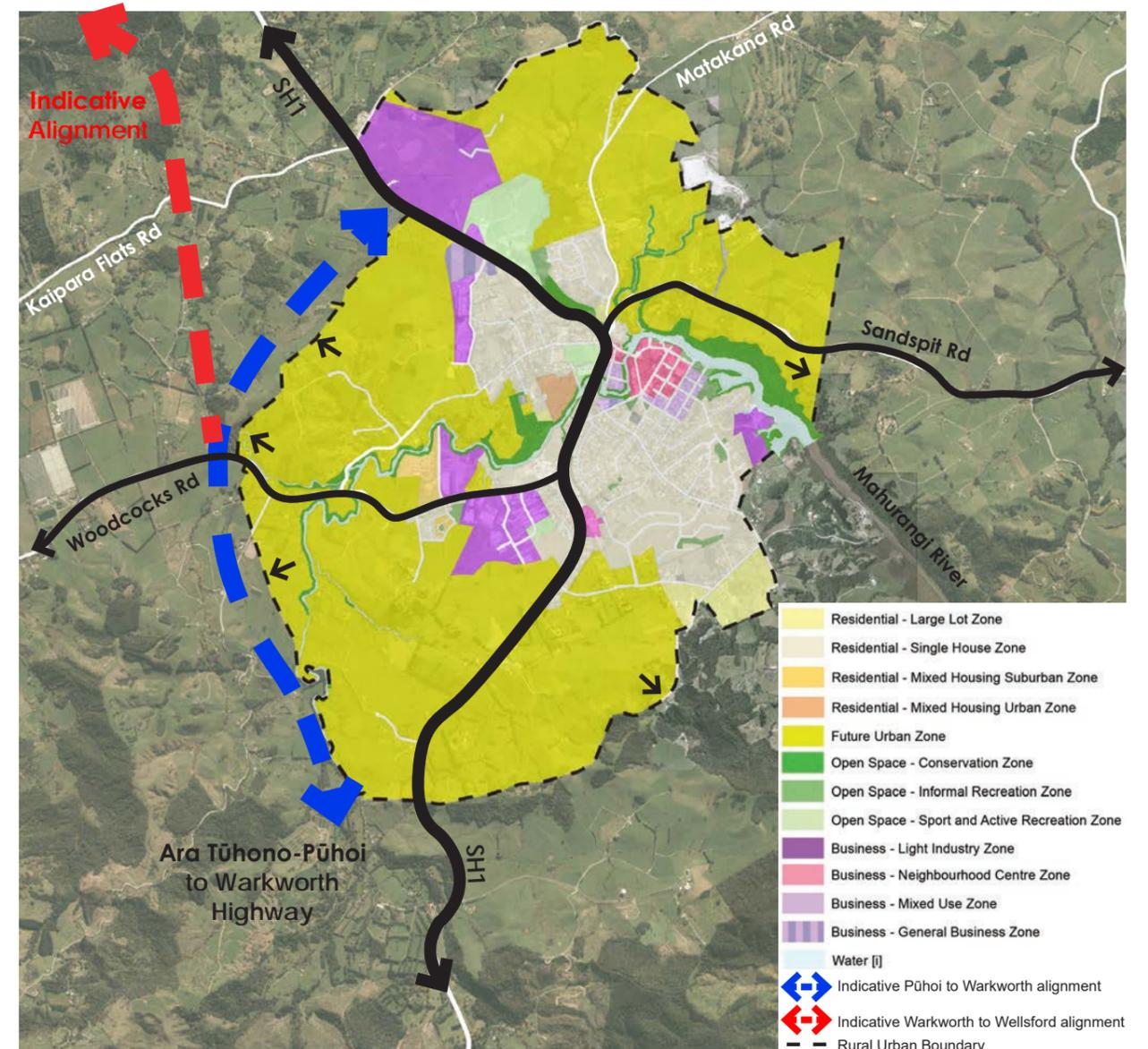


Figure 3: Warkworth Urban Morphology and Connection. Source: Auckland Unitary Plan zoning maps as at 2018.



Warkworth outskirts rural character



Corner of Homeward Bound Drive and Wayby Valley Road



Warkworth outskirts rural character

## Wellsford

Wellsford is connected to the history of Albertland, one of the last 'Special Settlement Schemes' of the mid nineteenth century. The area has similarities to Pūhoi which was settled around the same time. However, whereas Pūhoi was settled by people from Bohemia (mostly Catholic), Albertland was settled by 'non conformists' (Baptists) from Birmingham in Britain. The settlers were largely tradespeople and farmers. They began arriving in Auckland in late 1862 and continued to arrive until 1865. However, the original centre at Port Albert on the Kaipara Harbour did not thrive and a number of the settlers moved inland to more fertile land around Wellsford.

The town is a service centre for the surrounding rural economy, which during the nineteenth century included kauri saw milling, gum digging, and farming. The construction of the railway line in 1909 and all-weather roads in the 1930s allowed dairying to intensify and Wellsford to grow. The town has also become a service stop for traffic on SH1, being half-way between Auckland and Whangārei.

Wellsford is a hill-top town formed around the junction of SH1 and SH16. SH1 is a spine along the main ridge, and side roads follow the radiating spurs. The town therefore has something of an octopus-like shape. As a consequence of the hilltop location, Wellsford has an airy character and enjoys wide views over the surrounding countryside.

The Wellsford Urban Morphology figure shows future urban expansion, the Rural Urban Boundary (RUB) and Worthington Road ridge to the east of the town provide a natural boundary to contain the town and separate it from Ara Tūhono.

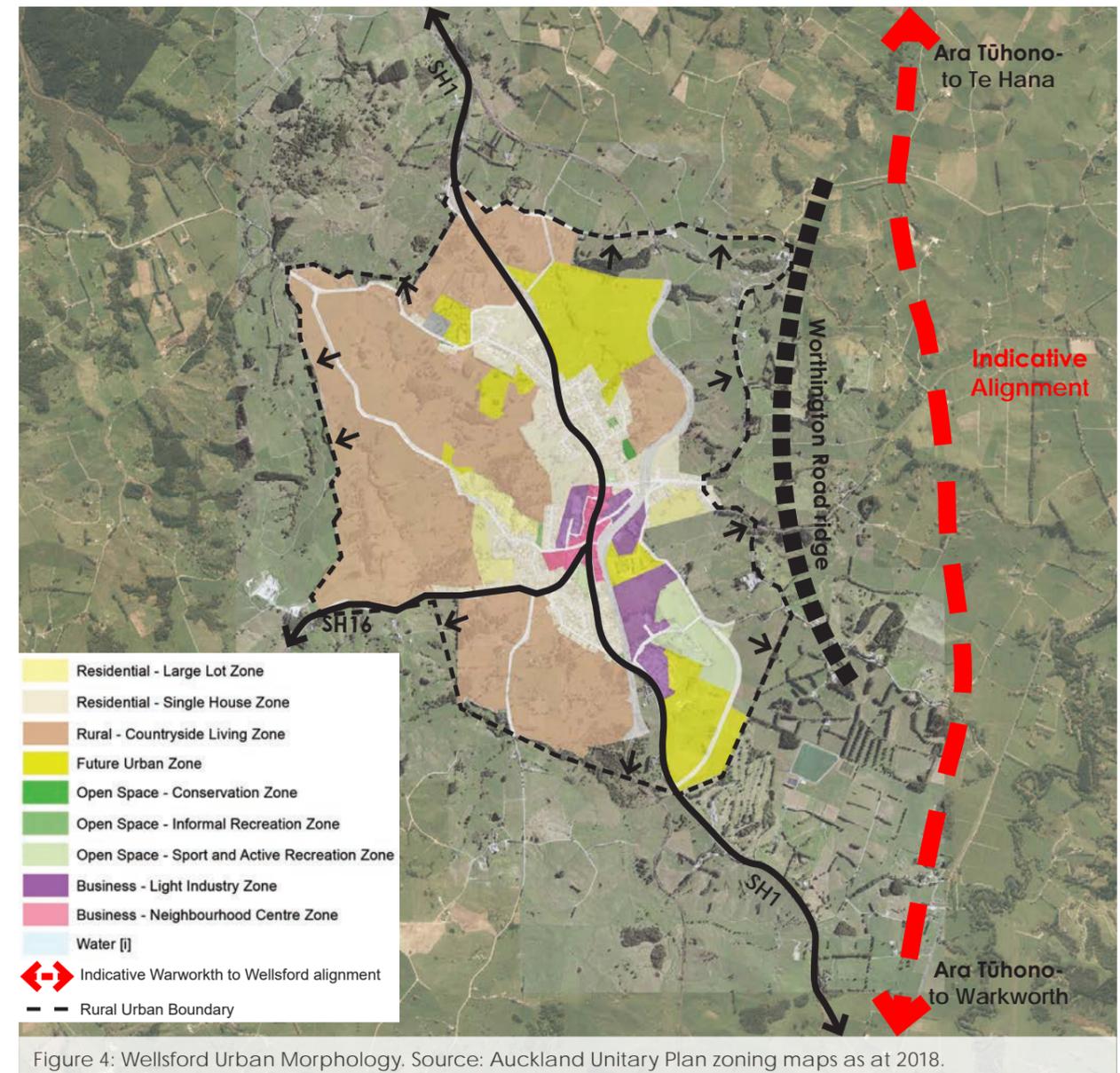


Figure 4: Wellsford Urban Morphology. Source: Auckland Unitary Plan zoning maps as at 2018.



Wellsford Town Centre



Entrance sculptures for entering Wellsford



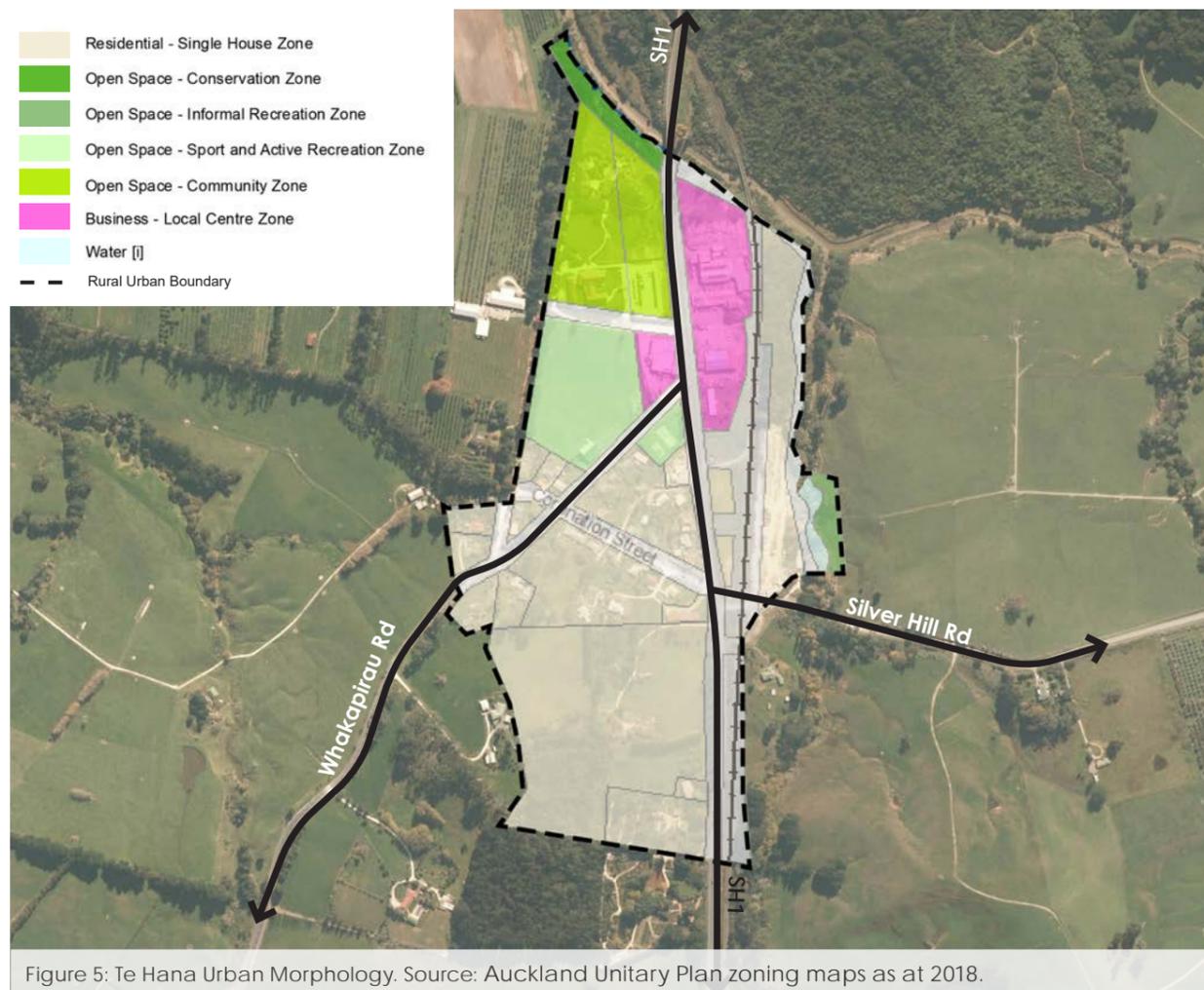
Wellsford 1955

## Te Hana

The existing Te Hana settlement developed around the Albertland Co-Operative Dairy Company factory which was built in 1934. It relocated from its original site at Port Albert to allow for expansion and better transport connections. The site is adjacent to the railway, SH1 and Te Hana Creek, a navigable headwater of the Kaipara Harbour. The factory buildings, the only substantial structures on the east side of SH1 within the Project area, have been adapted to a number of alternative uses since the dairy factory closed in 1987.

The most substantial feature on the west side of SH1 within the Project area is Te Hana Te Ao Marama Cultural Centre. The Centre contains a pallisaded pā and a large whareniui and cafe. The Centre introduces visitors to Māori culture.

The main natural features of the Te Hana settlement are Te Hana Creek and the hill overlooking the settlement on the creek's northern bank. The hill was the location of a pā commanding an east-west route between the Kaipara and Pakiri. The north-south routes of SH1 and the North Auckland Railway Line, on the other hand, are shoe-horned between the hill and the creek. Another feature of the settlement is the area of orchards immediately to the west.



## 2.3 Landscape Character Areas

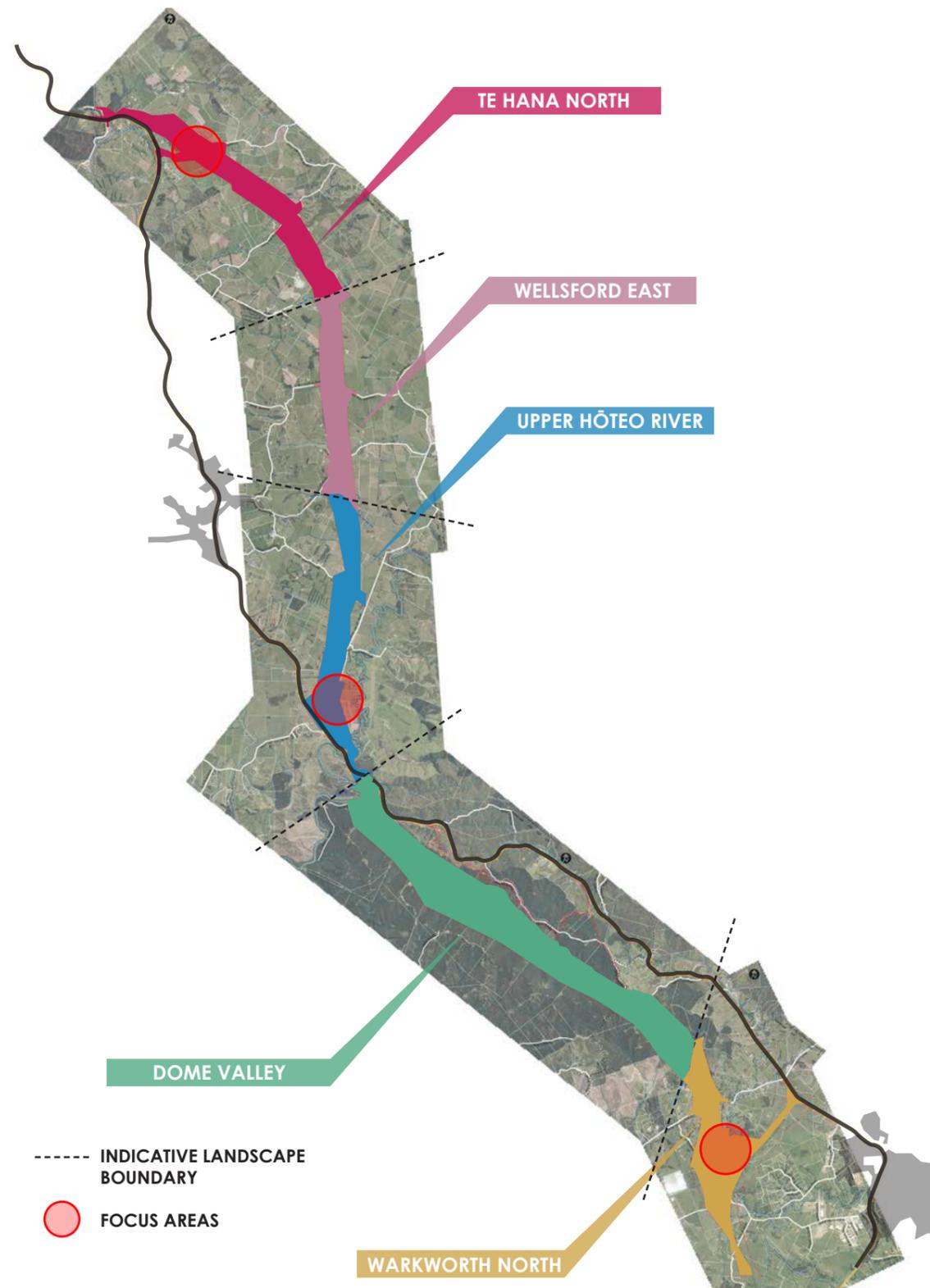


Figure 6: Landscape character areas

The Project and its surrounding landscape has been divided into five Landscape Character Areas (LCAs). The process of determining the LCAs involved mapping land use, elevation, slope, hydrology, land cover and aerial photography to define land use. From this information the Project and surrounds were divided into nine landscape units based on elevation and land cover. This information combined with a site visit to understand the human uses, associations and sensory aspects of the landscape, defined the five LCAs.

### Warkworth North LCA

The following are the key characteristics of this LCA (and the surrounding land to the east and west more generally):

- This LCA is comprised primarily of 'Lower Valley Pasture' with a single low ridge, described below, being classified as 'Hill Slopes Pasture'. Some isolated (as opposed to long connected swathes) of 'Lower Valley Native'; 'Hill Slopes Native' and 'Hill Slopes Exotic' contribute to a wide assortment of unit typologies over a small geographical area.
- The topography and slope are characteristic of the flatter valley lands that extend west through to the Kaipara Flats which features the Kōurawhero Stream – which in turn forms a tributary of the Hōteō River.
- A pattern of ownership, which includes the smallest/most densely arranged properties of any LCA in the project, and includes the rural residential margins of Warkworth.
- This LCA, and the land to the east and west, is predominantly used for agricultural activities; as it has been since colonisation. These activities comprise dry stock grazing (primarily sheep), with smaller areas of horticultural land (i.e. orchards) also present. Timber stock loading ramps and post and wire fencing is common throughout.
- The Mahurangi River, and its enclosing vegetation, is a key landscape feature.
- The Pūhoi to Warkworth project under construction with a connection to SH1 on the northern edge of Warkworth.



## Dome Valley LCA

The following are the key characteristics of this LCA (and the surrounding land to the east and west more generally):

- Forms part of a wider band of elevated hill country that stretches from the east coast (around Leigh/Pakiri) to the west coast (around Tauhoa). This land comprises a complex network of peaks, ridges, spurs, and narrowly incised stream gullies. This elevated hill country contrasts with the flatter valley lands to the north and south, and forms a backdrop to views from the northern parts of Warkworth.
- Notable peaks include The Dome (at 336m above mean sea level), to the east of the character area, and Kraack Hill (at 310m AMSL), within the character area. The Project within this character area includes the tunnel beneath Kraack Hill, and the valley landforms to the south and north of this summit.
- Vegetation cover particularly to the west – is mostly comprised of exotic vegetation and plantation forestry of *Pinus radiata* (Monterey Pine). Areas of indigenous vegetation are found along the northern side of the existing SH1 corridor, including around the Sunnybrook Reserve.
- A pattern of ownership, which includes the largest/least densely arranged properties of any LCA.
- A number of high value landscapes are located within or near to this character area, including ONL32 (Dome Forest) to the east of the Project, several Significant Ecological Areas (SEAs), two DOC reserves and the Te Araroa national walkway.
- The Dome is also known as Tohitohi o Reipae, and is a significant cultural boundary marker.



## Upper Hōteoro River LCA

The following are the key characteristics of this LCA (and the surrounding land to the east and west more generally):

- A broad, open and gently undulating valley landscape featuring the Hōteoro River, Auckland's longest river, and a number of its key tributaries some of which feature connected swathes (and pockets) of indigenous vegetation (which are recognised in the AUP(OP) for their ecological value(s)).
- This broad valley landform is enclosed further east by the steeply elevated hill country (a continuation of the Dome Valley Forest) which forms a ridgeline backdrop in views south/east, and a sequence of lower ridges to the west.
- A largely pastoral (grazing) land use, with more intensive (infrastructure) activities including SH1 (within the character area) and the Springhill Aerodrome and the North Auckland Railway Line to its west.
- Residential properties and dwellings are typically scattered; occurring at a low density overall. The highest frequency of residential properties occurs alongside and around Wayby Valley Road.
- Recreational activities include the Wellsford Golf & Squash Club and the lesser known Hōteoro Domain/Recreational Reserve.
- The Hōteoro River is a significant cultural boundary.



## Wellsford East LCA

The following are the key characteristics of this LCA (and the surrounding land to the east and west more generally):

- Sparsely populated, undulating to rolling farmland, characterised by a sequence of low ridges, which rise and form part of a more elevated ridge/land to the west of the character area (around Worthington Road). The 'Worthington Road ridge' provides a physical separation between the character area and the Wellsford settlement.
- The AUP(OP) has identified and provided for future growth in Wellsford through zoning of Future Urban Zone and Rural – Countryside Living, including to the west of this character area (west of the North Auckland Railway Line).
- Rural properties to the east of Wellsford.
- Ridgelines enclosing a network of stream courses, which feed into three main catchments, including those of the Hōteio River and Te Hana Creek.
- Predominantly open pastoral land use, with limited vegetation cover – typically pockets of exotic vegetation – and no apparent sizeable pockets of indigenous vegetation.



## Te Hana North LCA

The following are the key characteristics of this LCA (and the surrounding land to the east and west more generally):

- Sparsely populated, undulating to rolling farmland, characterised by a sequence of low ridges, which rise and form part of a more elevated ridge/land to the east of Te Hana.
- Elevated land to the east of the character area, which, together with a sequence of smaller ridges and spurs, forms an enclosing landform around a 'bowl' of low-lying land (less than 20m AMSL), which gently slopes down towards Te Hana Creek and the coastal, estuarine, Maeneene Creek to the west of Te Hana.
- Predominantly open pastoral land use. The only notable pockets of indigenous vegetation are found around the tributaries and main channel of the Maeneene Stream.
- The Te Hana settlement is located to the west of the character area, and features Te Hana Te Ao Marama, a Māori village/cultural tourism initiative.
- The character area and its surrounds feature three small quarries for the underlying limestone resource. Local farms have used the limestone for farm races and tracks. Other infrastructure elements include the North Auckland Railway Line at Te Hana and a high voltage transmission corridor to the west of the character area.
- The Te Hana ridge encloses views to the north east of Te Hana and provides a backdrop of an elevated landform with regenerating indigenous vegetation. The ridge has significant cultural and amenity values.



An aerial topographic map of a landscape corridor. The map shows a river winding through a valley, with a coastal area on the right side. The terrain is depicted with various shades of green and brown, indicating elevation and vegetation. A network of roads and paths is visible across the landscape. The text '3. Corridor Wide Landscape Principles' is overlaid in white on the right side of the map.

### 3. Corridor Wide Landscape Principles

### 3.1 Corridor Wide Landscape Principles

This section of the Planning Version ULDF identifies the particular corridor wide landscape principles for the Project. Some of these principles are the basis for mitigation of the Project’s effects under the RMA, as recommended by the Landscape and Visual Assessment (LVA). Other principles deliver on broader Transport Agency Land Transport Management Act (LTMA) objectives.

The principles have not been distinguished as to purpose, recognising there is a degree of overlap. At the detailed design stage, the ULDF should be updated to reflect these particular principles, as well as addressing the more general considerations in the Transport Agency’s “Bridging the Gap” urban design guidelines and “Landscape Guidelines”.

### 3.2 Project Specific Urban and Landscape Design Principles

A key aspect of the Planning Version ULDF is a landscape vision that integrates cultural values related to Ara Tūhono: Pūhoi to Warkworth and Hōkai Nuku design principles (as defined in section 3.7 of this ULDF), to define a story or kōrero for the wider project area.

The development of a landscape vision allows for these cultural values to be integrated with the new highway design and for the project’s landscape/urban design principles (as defined in section 1.2 of this ULDF) to be illustrated as opportunities.

#### 3.2.1 An Overall Landscape Vision:

Within the overall landscape vision, one of the key objectives for the corridor is to enhance the highway user experience. Within that objective, and for consistency purposes, the table below shows relevant principles developed for Pūhoi to Warkworth that are applied in this Warkworth to Wellsford project.

PRINCIPLE
<p><b>Clean Uncluttered Highway</b></p> <ul style="list-style-type: none"> <li>• Enable people to read the landscape by maintaining views of landscape features, exposing geology, integration with adjacent landform.</li> <li>• Where practicable, maintain natural landforms, water courses, vegetation cover, and land uses.</li> <li>• Simple, well designed structures that blend into the landscape.</li> <li>• Ensure NZTA highway and landscape management and maintenance considerations are addressed.</li> <li>• Consideration should be given to the operational boundary and residual land management.</li> </ul>
<p><b>Stitched Together Landscape</b></p> <ul style="list-style-type: none"> <li>• Connect local roads that are severed by the Project.</li> <li>• Where practicable, maintain connections to local trails, greenways and recreational facilities.</li> <li>• Reconnect patches of native vegetation and streams.</li> <li>• Where practicable, make connections/linkages to support ecological corridors.</li> </ul>

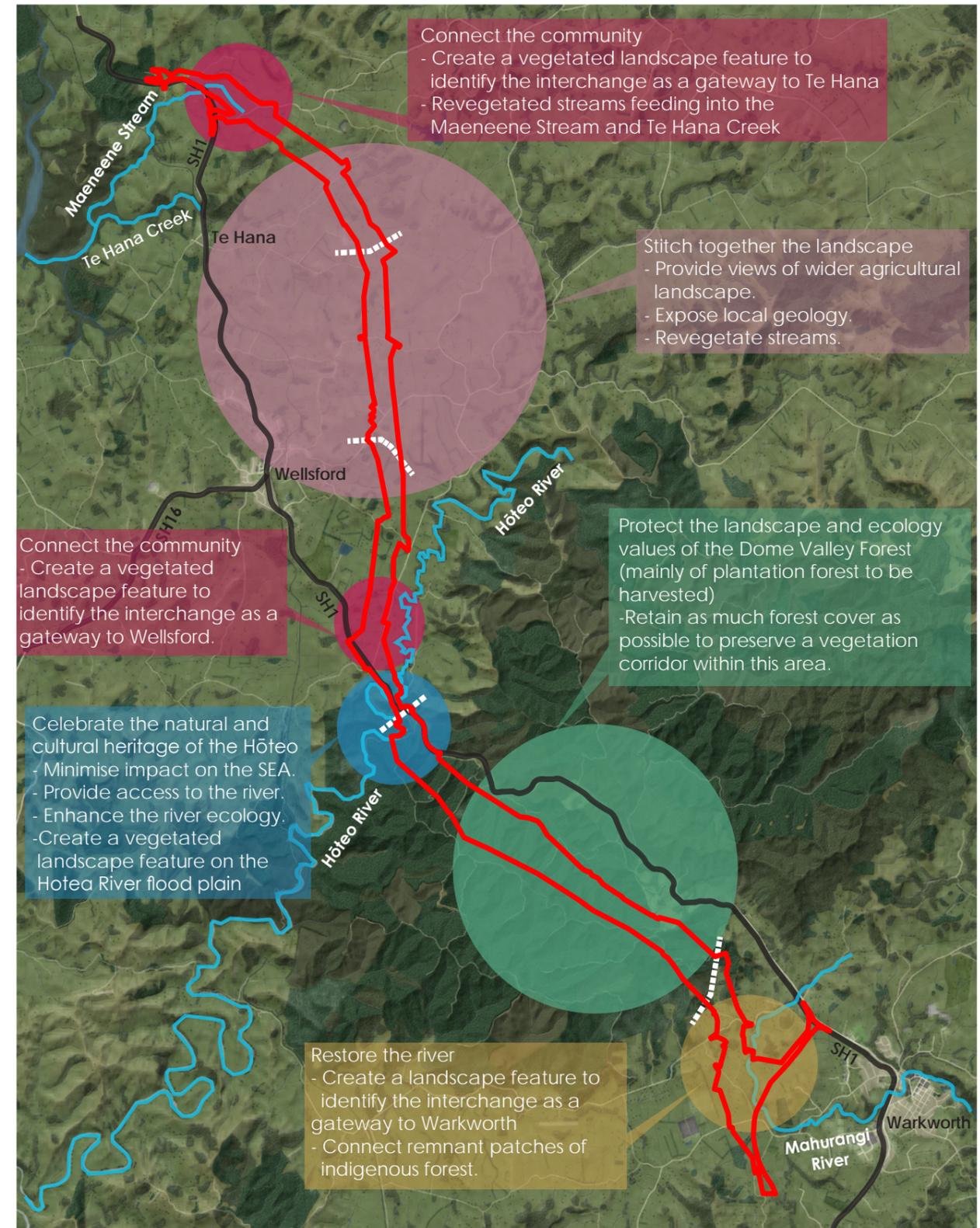


Figure 7: Preliminary Landscape Vision and overall principles (These principles apply to the entire corridor).

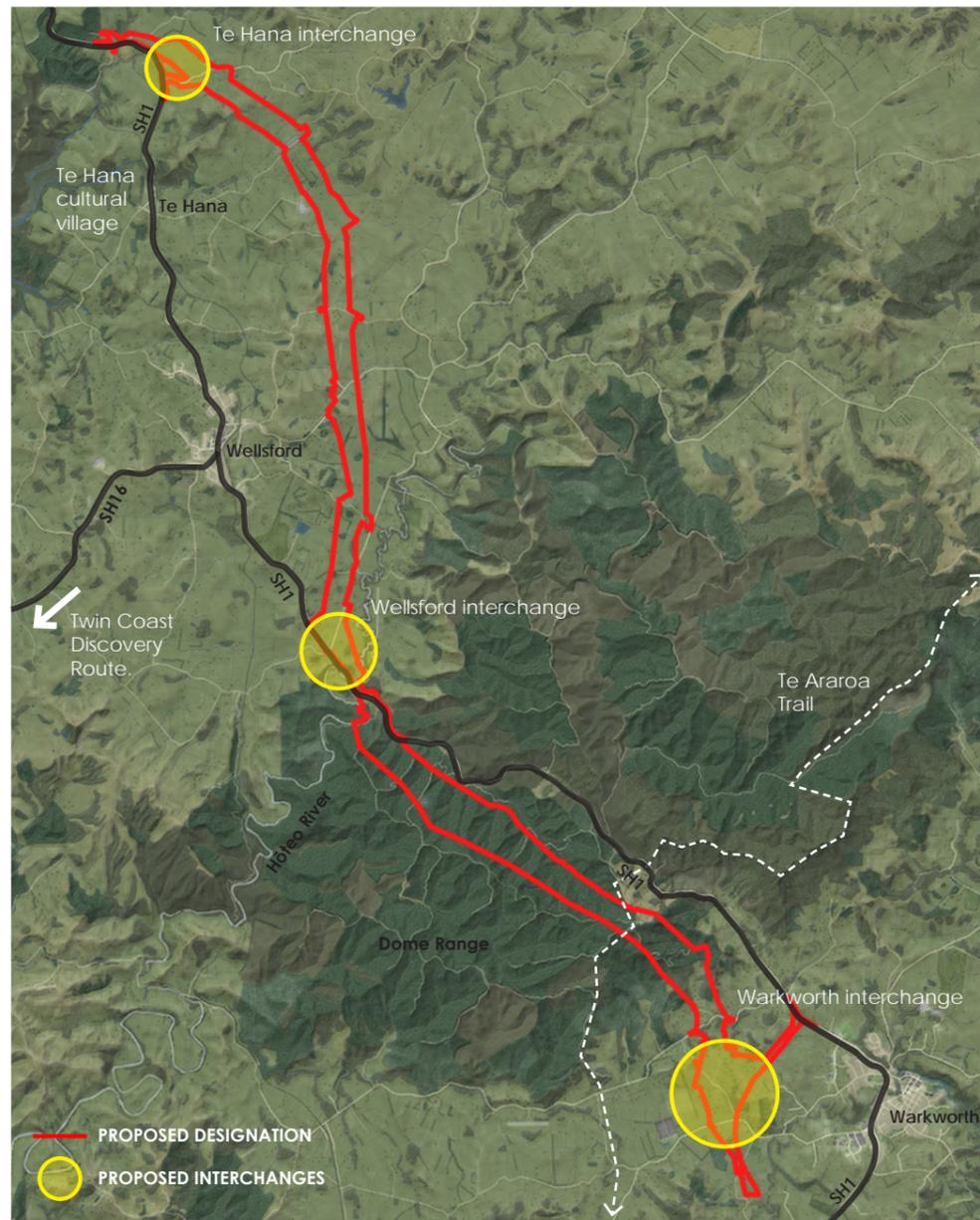


Figure 8: Proposed Project Designation and Interchanges



Figure 9: Interchange example: Similar with Te Hana and Wellsford on and off ramps connecting to roundabouts. Te Hana and Wellsford interchanges to have spill through abutments at the underpass (Refer to figure 16).

**PRINCIPLE**

**Human Landmarks**

- Recognise and protect human features in the vicinity of the Project, including: Te Ao Marama a Māori Cultural Centre, sites of cultural significance to mana whenua, Hōteao River bridge, other landmarks and archaeological features.
- Recognise existing urban settlement and their historic and built heritages.
- Engage with Iwi utilising the Te Aranga principles to develop an understanding of their values associated with the Project area and identify opportunities to interpret this in the landscape.

**Celebrate Natural Features Along the Corridor**

- Minimise impacts and maintain natural qualities of landscape features streams, wetlands, landform and remnant patches of indigenous forest.

### 3.3 Connectivity

The Project is proposed to have three interchanges to serve the towns of Warkworth, Wellsford and Te Hana respectively. All of them will provide connections to the local community and retail centres, Te Hana Te Ao Marama cultural centre and the Twin Coast Discovery Route. The Warkworth interchange is a major connection to Warkworth, a regional growth node, providing connections to Matakana and the eastern beach settlements of the area.

**PRINCIPLE**

**Access for All**

- Provide a clear and convenient access from the State Highway to the centres of Warkworth, Wellsford and Te Hana, in order to connect rural communities and their centres with the state highway network.
- Maintain local road connections across SH1 using grade separation to maintain connections for rural communities, particularly local roads such as Kaipara Flats Road, Rustybrook Road, Whangaripo Valley Road, Farmers Lime Road and Silver Hill Road.
- Realign other roads such as Wayby Valley Road, Phillips Road, Vipond Road and Mangawhai Road.
- Provide access to rural properties where necessary.
- Maintain connections/access to Te Araroa trail.
- Accommodate all transport modes and connections identified in the Active Modes and Recreational Network Plan.
- Provide a safe corridor to access for operation and maintenance.

### 3.4 Wayfinding and Highway Stopping Places

Key to the connectivity and wayfinding strategy is to provide well signposted and direct routes from the state highway interchanges to local towns and the communities they service, which offer an opportunity for creative way-finding as well as physical connections.

Safe access to customer facilities should also be provided using Crime Prevention Through Environmental Design (CPTED), particularly to avoid opportunities for crime and antisocial behaviour, with clearly defined public spaces that are well used and visible.

PRINCIPLE
<p><b>Visual Legibility.</b></p> <ul style="list-style-type: none"> <li>• Develop design features with a cultural narrative and local themes defined in consultation with interest groups, mana whenua, and communities to celebrate the local heritage, cultural identity.</li> <li>• Provide clear signage that identifies local towns and attractions as highway stopping places.</li> <li>• Highlight Warkworth, Wellsford and Te Hana as highway stopping places.</li> <li>• Consider customer and journey experience.</li> </ul>

### 3.5 Landscape and Ecology

The landscape and ecological strategy for the Project is founded on maintaining and enhancing biological diversity, and the diversity and connectivity of landscape patterns and mosaics.

PRINCIPLE
<p><b>Integrated Resilience</b></p> <ul style="list-style-type: none"> <li>• The design should minimise impact on SEAs where possible and seek to connect and link systems across the landscape.</li> <li>• Mitigation measures should support the development of resilient ecosystems such that they build structure and function, and enable or enhance their adaptive capacity for the future.</li> <li>• Mitigation should be a cohesive and integrated package of activities and outcomes to maximise the environmental benefits including hydrology, habitat, sustainable cultural harvest and aesthetics.</li> <li>• Mitigation should focus on revegetating a few key large areas where the highest ecological and landscape values exist to create resilient, ecologically valuable and legible landscape features.</li> <li>• Mitigation planting should include weed and pest management until adequate establishment.</li> <li>• Specific measures should be implemented for current biosecurity issues including Kauri die back and myrtle rust,</li> </ul>

### 3.6 Place Making on The Corridor and in Urban Environments

As place-making is the retention of physical, cultural and social identities that define a place and support its ongoing evolution it needs to be community-driven, collaborative, context-specific and focused on creating destinations. It should incorporate input from iwi groups to reflect cultural heritage values and input from local communities to support local identity and community cohesion.

PRINCIPLE
<p><b>Integration of Natural and Cultural Landscape.</b></p> <ul style="list-style-type: none"> <li>• Enable cultural interpretation through early engagement with stakeholders including iwi and mana whenua. Develop a design through this collaboration that, as far as practicable, addresses local community and mana whenua views and aspirations.</li> <li>• Capture and frame key views to important landscape elements, particularly from elevated structures at interchanges to reinforce a sense of place.</li> <li>• Complement distinctive landscape elements with additional features building on natural features to enhance their significance and contribute towards the creation of a meaningful landscape.</li> <li>• At the three interchanges create a distinctive and memorable landscape statement to create a sense of arrival, signal the turn-off/entry to each town. Use elements characteristic of the area to celebrate the local heritage, with local cultural meaning representing natural or historic values underpinning the identity of each town.</li> </ul> <p>Specific opportunities to elaborate and illustrate local narratives include:</p> <ul style="list-style-type: none"> <li>• Mahurangi River – build on the river landscape and its associated Māori cultural values as a feature of Warkworth.</li> <li>• Hōteao River – identification of the cultural boundary and reconnect remnants of flood plain forests.</li> <li>• Wellsford interchange - reinforce sense of place and identity, building on existing themes such as corrugated iron, or celebrating historic elements such as the Kauri gum.</li> <li>• Te Hana – expanding the cultural village identity at the Te Hana interchange.</li> </ul>



Exposed Pakiri Formation rock, SH1, Pohuehue.

### 3.7 Integrating Iwi and Hapū Values

Essential Māori cultural values expressed in Te Aranga Principles enhance mana whenua presence, visibility and participation in the design of Ara Tūhono Warkworth to Wellsford. These principles can be found in the Auckland Design Manual ([http://www.aucklanddesignmanual.co.nz/design-thinking/maori-design/te\\_aranga\\_principles](http://www.aucklanddesignmanual.co.nz/design-thinking/maori-design/te_aranga_principles)).

In addition, this Planning Version ULDF has incorporated principles defined in collaborative work with Hōkai Nuku (the alliance formed in 2010 by the mana whenua of the Project area, namely Ngati Manuhiri, Ngati Mauku/Ngati Kauae of Te Uri o Hau, Ngati Rango of Ngati Whatua o Kaipara and Ngati Whatua Iwi) for the Pūhoi to Warkworth section." The following principles were developed with Hōkai Nuku for Pūhoi to Warkworth and are considered relevant for the Warkworth to Wellsford section.

PRINCIPLE
<p><b>Hōkai Nuku Design Principles<sup>7</sup></b></p> <p><b>1. Rangatiratanga</b></p> <ul style="list-style-type: none"> <li>Affirming the self determination of iwi and hapū and honouring the Treaty partnership between Hōkai Nuku and the Transport Agency by active engagement throughout the Project development.</li> </ul> <p><b>2. Mana Tangata</b></p> <ul style="list-style-type: none"> <li>Tūpuna (ancestors) are celebrated in the naming of structures.</li> </ul> <p><b>3. Mana whenua</b></p> <ul style="list-style-type: none"> <li>Cultural reference points are acknowledged with pou whenua, pou paenga and other designs.</li> <li>Enduring cultural artworks.</li> </ul> <p><b>4. Kaitiakitanga</b></p> <ul style="list-style-type: none"> <li>Guardianship rights and responsibilities are actualised by enhanced indigenous planting which supports the ecosystem and cultural practices.</li> <li>Protecting and enhancing waterways.</li> <li>Utilising sustainable design and practices.</li> <li>Ability to access appropriate planting for cultural harvest (subject to appropriate safe access safety constraints, eg via local access points).</li> </ul>

*Extrated from the Pūhoi to Warkworth Urban and Landscape Design Framework<sup>7</sup>.*

Elements such as Pou Whenua or other landmarks and locally specific indigenous planting are part of the outcomes expected as ways to implement these principles. The Transport Agency will seek advice from mana whenua for the naming of name the highway features (e.g. viaducts and bridges).



Pou Whenua Carvings - Mt Eden Park, Auckland



Waikato expressway pou at Waikato River Bridge



Art integrated to Waikato River bridge. Bridge form completely outside the river bed.

Examples of cultural footprint art and mana whenua values in the landscape.

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An aerial topographic map of a coastal region, showing terrain contours, roads, and water bodies. The map is overlaid with a semi-transparent dark green layer. The title text is positioned in the upper right quadrant of the map.

# 4. Project Specific Mitigation Principles and Opportunities

## 4.1 Project Specific Mitigation Principles and Opportunities

This section of the Planning Version ULDF identifies illustrative mitigation principles for key features and areas along the corridor and the relevant guidelines to be adopted that will inform future design development of the Project.

## 4.2 Viaducts and Bridges

The Project (based on the Indicative Alignment) anticipates 21 bridge structures. These have the potential to be dominant structures in a rural landscape. Therefore, to minimise their dominance the bridges should be designed following the Transport Agency urban design guidelines below.

PRINCIPLE
<p><b>Visual Legibility.</b></p> <ul style="list-style-type: none"> <li>Urban design guidance and design principles for road bridges are set out in section 4.12 of Bridging the Gap, NZTA Urban Design Guidelines (Oct 2013) the Transport Agency Bridge Manual and appendix 5: "Urban Design considerations in bridge design" of Bridging the Gap NZTA Urban Design Guidelines and "appearance" in the Bridge Manual.</li> <li>The Hōteio viaduct spans, SH1, The Waiteraire Stream, two SEAs, and the Hōteio River. It is considered that the landscape sensitivity of this area plus the scale and visibility of this structure justifies a specific design focus in the ULDF. The Hōteio Bridge plan highlights key landscape and urban design considerations for pier spacing. It indicates that piers should span water courses and be located on the outer edges of the SEA. This will enable bush under the viaduct to be retained (apart from canopy trees which would have to be topped) in the centre which is considered to maintain the highest ecological values.</li> <li>In accordance with these documents, the form, geometry, materials and construction of bridge structures is to be considered to create a simple, elegant whole and to minimise the bridge profile. The structural forces at play in the bridge should be reflected in its design. This generally results in structural integrity and a pleasant composition.</li> </ul>



Figure 10: Example only; Illustration of clean (minimalist) aesthetic principles for bridges.

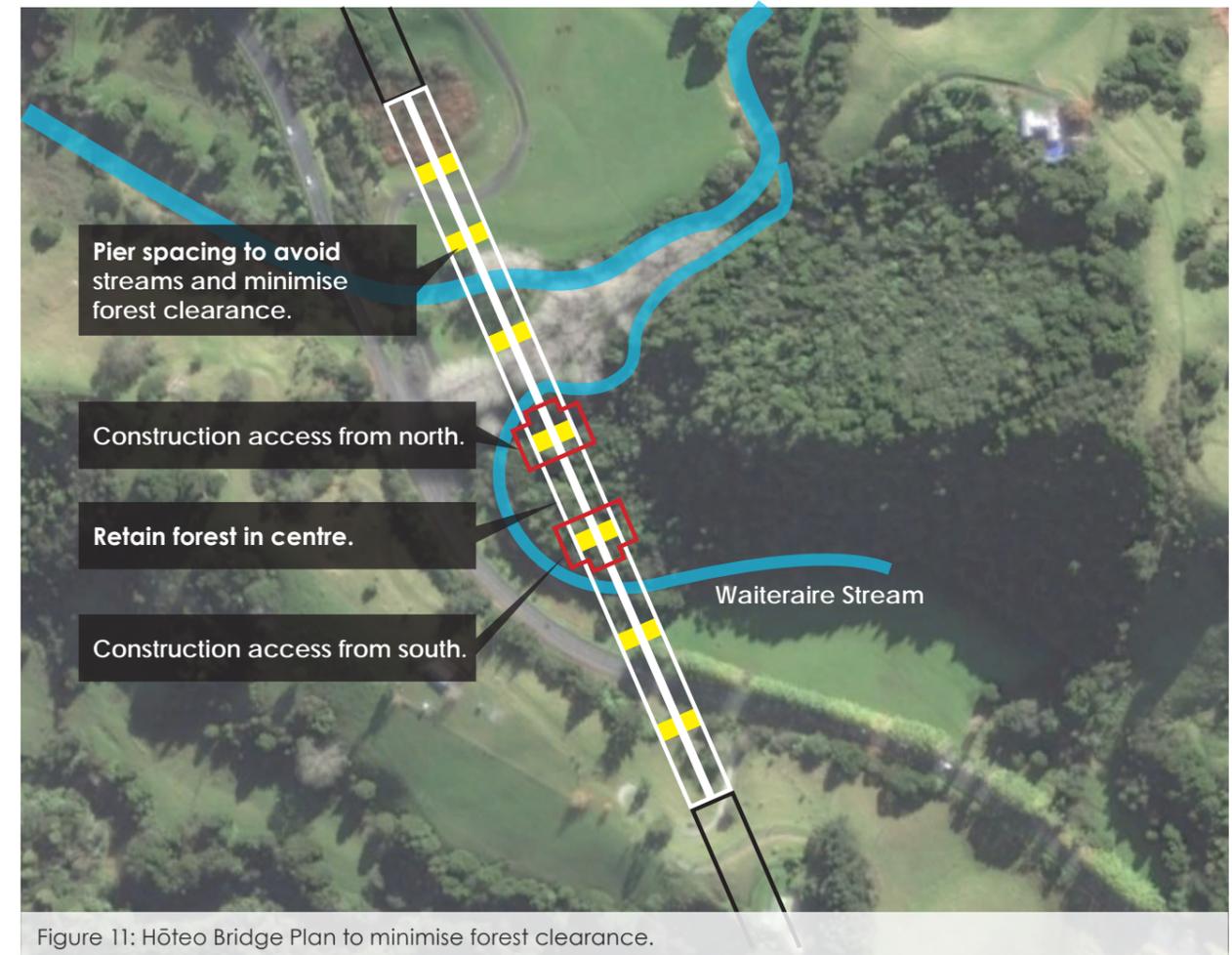


Figure 11: Hōteio Bridge Plan to minimise forest clearance.



Figure 12: Waiwera River viaduct example of a good bridge design with no services visible, piers spanned to minimise impact on estuary and a slender super structure that uses light and shadow as design elements.



Figure 13: Indicative perspective view of Warkworth interchange landscape approach and flood plain



Figure 14: Indicative perspective view of Wellsford interchange landscape approach



Figure 15: Indicative perspective view of Te Hana interchange landscape approach

### 4.3 Interchanges

The Project provides state highway access to a number of rural communities and townships, improving the connectivity between the medium to long term growth areas in the northern Rodney area (Warkworth and Wellsford).

This will require careful consideration of landscape and urban design treatments and their scale to clearly identify or signal entry and exit to the highway. This should be complemented by highway furniture and other forms of signage to allow for the identification of adjoining townships and coastal areas as key journey destinations.

PRINCIPLE
<p><b>Visual Legibility.</b></p> <ul style="list-style-type: none"> <li>• For specific urban design guidelines refer to the Transport Agency Landscape Guidelines (Final Draft) Section 4.2 Peri-Urban Environments Gateways and Thresholds.</li> <li>• A hierarchy of gateway treatments needs to be developed that reflects the scale, function and characteristics of Warkworth, Wellesford and Te Hana.</li> </ul> <p><b>Warkworth Interchange:</b></p> <ul style="list-style-type: none"> <li>• Plant residual land between main alignment and ramps to reduce maintenance, integrate structures.</li> <li>• Reinforce riparian vegetation along the Mahurangi River to support the function of the SEA and visually emphasise the river as a landscape feature.</li> <li>• Use native planting, as far as practicable, to create a distinctive landscape scale gateway to Warkworth with the river corridor as a feature.</li> <li>• Use native planting, as far as practicable, to create a distinctive landscape scale gateway to Wellsford and Te Hana.</li> <li>• Incorporate stormwater ponds within the interchange to visually connect with the Mahurangi River and flood plain.</li> <li>• Provide planting on the outside of ramps and link roads to screen views of the interchange from adjacent properties.</li> <li>• Locate wayfinding signage so tourists have sufficient time to navigate exits.</li> </ul> <p><b>Wellsford and Te Hana:</b></p> <ul style="list-style-type: none"> <li>• Consider Wellsford &amp; Te Hana interchange together as the gateway signaling access to Wellsford and Te Hana whilst allowing for the expression of local identity.</li> <li>• Plant residual land between main alignment and ramps to reduce maintenance and integrate structures.</li> <li>• As far as practicable, provide native planting on the outside of ramps and link roads to screen views of the interchange from adjacent properties.</li> <li>• Locate wayfinding signage so tourists have sufficient time to navigate exits.</li> <li>• Consider scale, speed and distance in the design of the landscape scale gateways to create a safe, convenient, attractive and legible gateway environment (refer to section 4.2 of the Transport Agency's Landscape Guidelines).</li> </ul>

## 4.4 Tunnels and Associated Infrastructure

The key landscape issue for tunnel structures on the Project is integration of tunnel approaches and portals with the landform and skyline. Of particular note, is the visual integration of the tunnel southern approaches in regard to rural residential and other wider viewpoints from Warkworth township and the key defining role of Kraack Hill in establishing the bush hill country character as a backdrop to Warkworth. This issue includes the visibility of headlight glare and roading lighting from tunnel approaches and portals at night with the aim of maintaining the appearance of Kraack Hill and the Dome Valley Forest as a rural landscape.

PRINCIPLE
<ul style="list-style-type: none"> <li>For specific urban design guidelines refer to the Transport Agency Bridging the Gap pages 93 to 94, and Section 5, Environmental and Social Responsibility of the Transport Agency Guide to Road Tunnels, First edition, December 2013.</li> </ul>
<p><b>Project specific considerations:</b></p> <ul style="list-style-type: none"> <li>Tunnel portals should be designed to integrate with landform as per the Johnstones Hill Tunnel.</li> <li>Tunnel infrastructure including control buildings and deluge tanks should be located to avoid adverse landscape and visual effects.</li> </ul>



Johnstones Hill Tunnels are a good example of tunnel portal integration with the landscape. The portals were extended beyond the tunnel and truncated at a similar angle to the adjacent landform.

## 4.5 Walking and Cycling

PRINCIPLE
<ul style="list-style-type: none"> <li>Key walking and cycling design considerations are identified in the Transport Agency urban design guidelines Bridging the Gap, sections 4.5 Pedestrian Paths, 4.6 Pedestrian Crossing, 4.7 Cycling and Paths, 4.8 Pedestrian and Cycling Bridges, 4.9 Underpass Design, 4.10 Lighting and 4.11 Crime Prevention.</li> </ul>
<p><b>Project specific considerations:</b></p> <ul style="list-style-type: none"> <li>Future cycleways are proposed from Wellsford along Whangaripo Valley Road to connect with Pakiri, and from Te Hana along Mangawhai Road to Mangawhai. The Project design should incorporate separated shared path access into these bridge underpasses, as indicated in figure 16.</li> <li>Other opportunities to enhance access to the Te Araroa Trail and the Hōteu River could be created through the provision of stopping places on existing SH1.</li> <li>Reduction of opportunities to commit crime using CPTED: Ensuring spaces have clear orientation, passive surveillance, clear sight lines, sense of ownership, well designed and maintained environments and security features where needed.</li> <li>Provision of connectivity across the designation and between local, inter-regional and metropolitan areas, achieving a balance between regional movement and local connectivity especially between or through urban or recreational areas.</li> </ul>

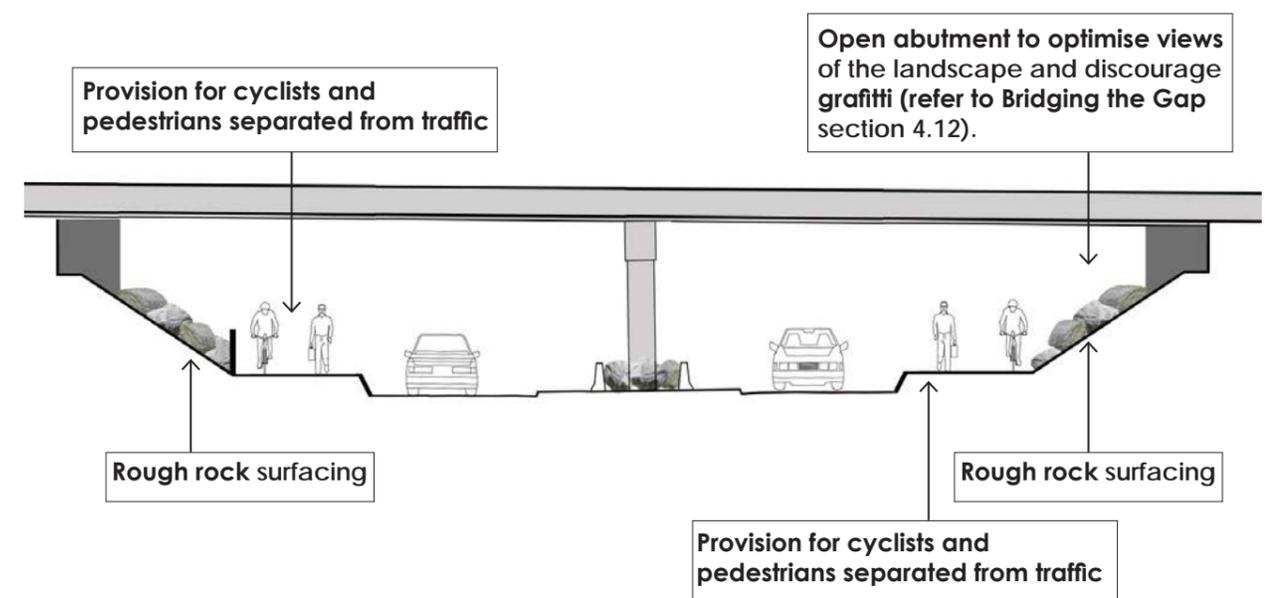


Figure 16: Typical Local Road / Shared Path Underpass, refer to "Bridging the Gap" for guidance on multimodal underpasses.

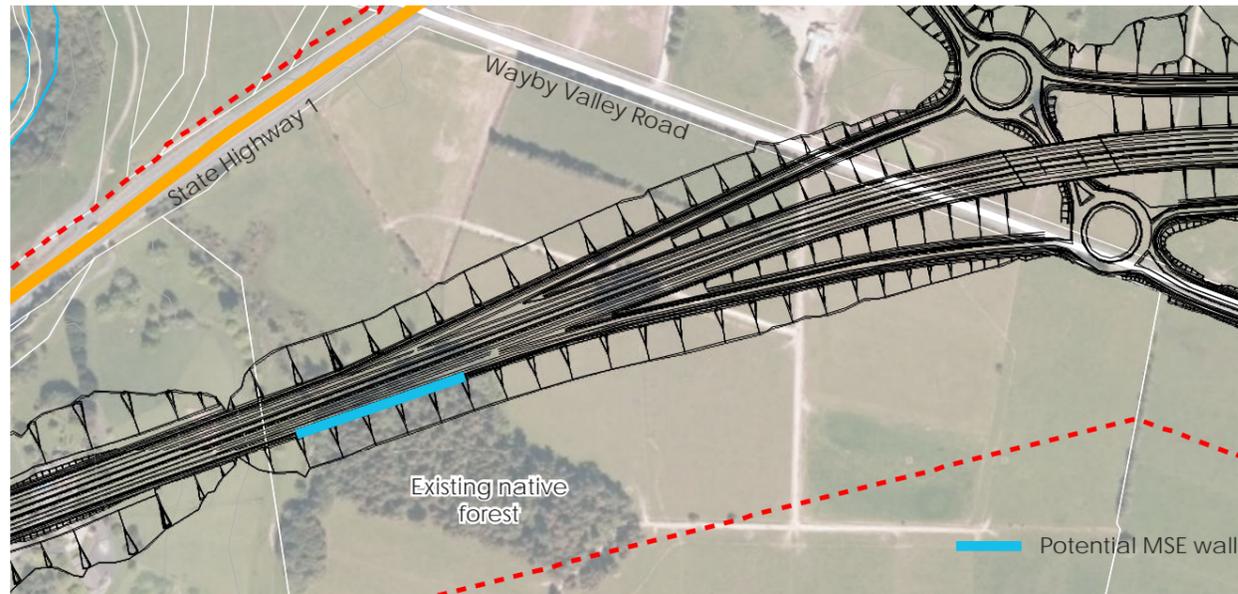


Figure 17: Example of potential opportunity to reduce the extent of vegetation clearance by utilising an MSE wall



MSE Retaining wall with a soil and vegetation system integrated. No exotic species with potential to invade areas of native bush.

## 4.6 Retaining Walls and Earthworks

Retaining walls are often necessary in steep topography, in constrained highway corridors and in grade-separated junctions. The main design issue associated with retaining walls is their visual impact, especially where high walls are required or where walls are viewed at close range by pedestrians or road users.

In rural environments, such as the Project area, careful earthworks design can minimise the need for retaining walls. Where retaining walls are visible from the state highway, any adjoining local roads, walkways, cycle paths or nearby residents, they should have good architectural design and finishes. Both the experience of highway users and the perception of the surrounding community should be considered in the design of the retaining wall, particularly critical is the prevention and discouragement of vandalism in the form of graffiti and tagging.

PRINCIPLE
<ul style="list-style-type: none"> <li>For specific urban design guidelines refer to the Transport Agency Bridging the Gap Section 4.13 Retaining Walls.</li> <li>Avoid shotcrete as it is the least preferred means of stabilisation. If unavoidable, minimise its use in ways such as set out in the NSW government, Transport Road &amp; Airtime Services "Shotcrete design guideline, Design guideline to improve the appearance of shotcrete in NSW". <a href="http://www.rms.nsw.gov.au/documents/projects/planning-principles/urban-design/shotcrete-design-guidelines.pdf">http://www.rms.nsw.gov.au/documents/projects/planning-principles/urban-design/shotcrete-design-guidelines.pdf</a></li> </ul> <p><b>Project specific issues:</b></p> <ul style="list-style-type: none"> <li>Indicative alignment cuts through existing indigenous forest remnant SEA-T-6851. Indicative solution involves steepening the proposed batter with a Mechanically Stabilised Earth (MSE) wall to minimise the extent of vegetation clearance.</li> </ul>

## 4.7 Landscape Mitigation

As part of the Assessment of Effects on the Environment (AEE), section 5 of the Landscape and Visual Effects Assessment recommends several measures in order to mitigate the landscape and visual effects of the Project. The recommended mitigation measures are listed under the following headings; Construction, Earthworks, Planting and revegetation and Structures and Features.

This Planning Version ULDF is the first phase of an evolving document that demonstrates via design principles and examples how the project will be integrated into the landscape to minimise impacts and tie in with surroundings.

The ULDF will continue to evolve as mana whenua, the community and stakeholders are consulted and the conditions of designation and consent are addressed.

