Ngaaruawaahia, Taupiri, Hopuhopu and Horotiu

Walking, Cycling and Micromobility Assessment

April 2024

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TRANSPORTATION SPECIALISTS

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EXECUTIVE SUMMARY

Flow has been commissioned by Waikato District Council (WDC) to conduct a transportation study for Ngaaruawaahia, Hopuhopu, Taupiri and Horotiu to understand how future growth until 2050 will affect the existing transport networks in these areas, as well as to undertake a high-level walking, cycling and micromobility assessment for Ngaaruawaahia, Hopuhopu, and Taupiri. Our assessment is divided into two parts: Part A focuses on traffic modelling and road network evaluation, while Part B (this report) assesses Micromobility/Walking/Cycling connectivity within and to/from the townships.

Our assessment has identified a long-term walking, cycling and micromobility network, that connects origins and destinations within each township and provides a regional network connecting the 4 urban areas. The network is illustrated in Figure ES1 overleaf. More detailed maps are appended to this report.

It is important to recognise that the network includes ***walking, cycling and micromobility networks***, combined. While these three modes are often grouped together as "active modes", they differ significantly in terms of their infrastructure requirements. Walking networks tend to be very fine grained, and include all streets within an urban area. By contrast, cycling networks tend to be more skeletal, with fewer urban streets represented. As a result, where we have identified a street as a priority within the overall active mode network, in some cases this may consist of walking infrastructure alone.

Our recommended network includes the following 5 route types, and stages these according to existing routes, short-medium term interventions, and longer-term interventions:

- The **Te Awa River Ride** along the Waikato River, that provides a north-south spine for the region as well as a primary recreational route
- **Regional connections** that provide connectivity between Ngaaruawaahia, Hopuhopu and Taupiri, which form the spine of the network
- **Core routes** that provide the main links between key trip generators/attractors
- **Local routes** to connect and provide access to individual homes and destinations. We have not mapped local routes, as all local streets need to fulfil this role in the network
- **Recreational trails** that provide walking and cycling routes through public reserves and natural spaces.

More detail on the characteristics expected of each of the 5 route types are listed in Table ES1 on subsequent pages.

We have provided recommended staging for the various elements of the network, classifying routes by:

- Existing, completed routes
- Short-medium term interventions – either existing streets that do not meet current best practice for walking, cycling and micromobility and that may require improvements, or new routes such as extensions to the successful Te Awa River Ride
- Longer-term interventions – generally future streets or improvements to existing rural roads that are necessary to support future land use development, but not needed until that development takes place.

Figure ES1: Proposed active mode network (refer Appendix A for high resolution maps)

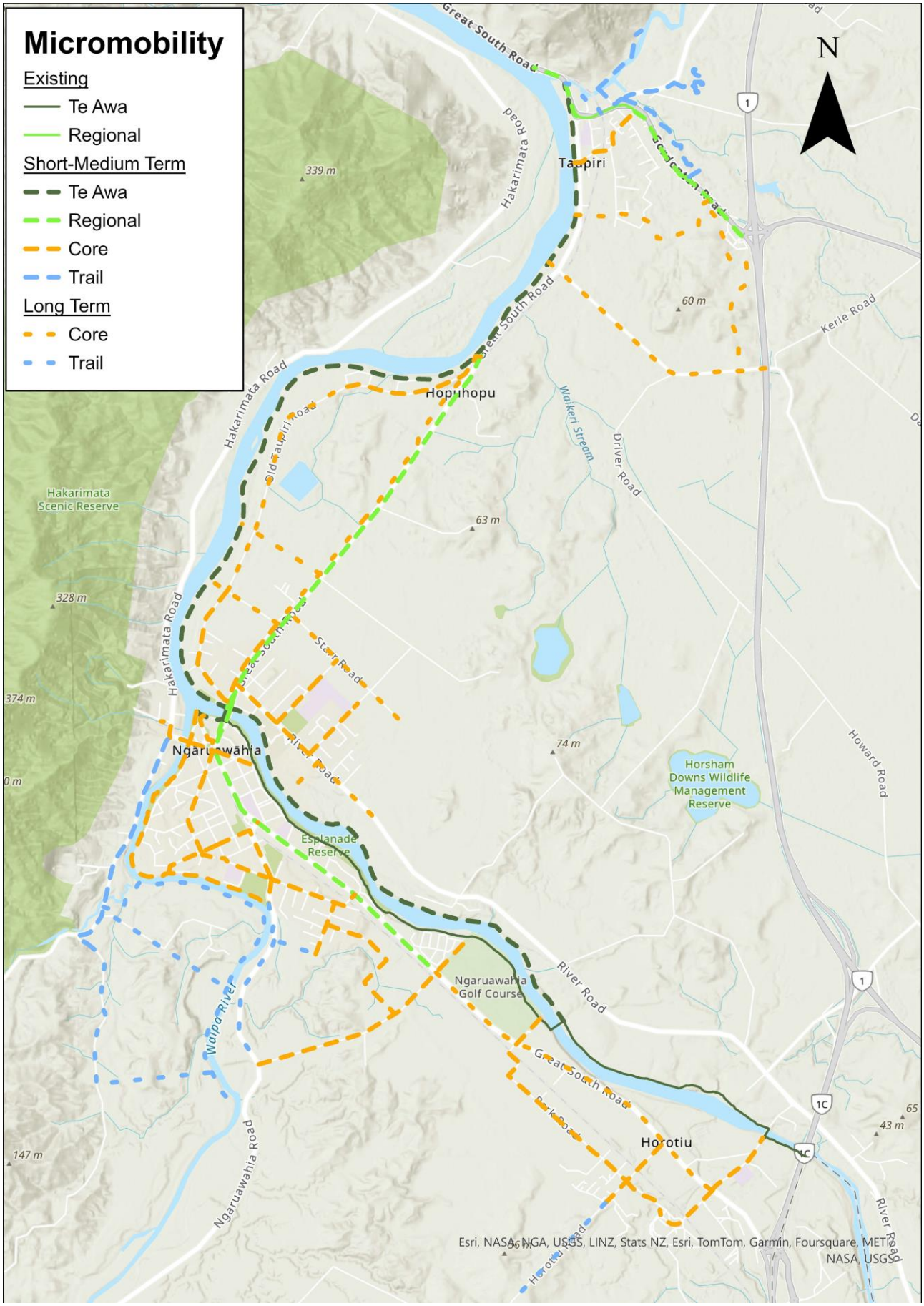


Table ES1: Route hierarchy and type of facility

Route type	Function	Environment	Users	Type of Facility
Te Awa and Regional routes	Major routes connecting town centres and used for longer journeys	Busier, higher speed arterial roads, or in the case of off-road routes, parallel to them. Routes traverse both urban and rural areas.	Combination of utility trips (trips to education, employment, and other destinations), recreational riders and cycle tourers. Likely to serve high volumes of cyclists.	Off-road routes with little or no conflict with general traffic. May be shared paths or separated walking and cycling paths. On-road routes using the street network where conflict with general traffic is managed. Likely to include both footpaths and cycle infrastructure that are separated from general traffic, with appropriate safe crossing locations. Safe (raised or signalised) crossings at intersections and priority to active modes across driveways.
Core routes	Second tier "feeder" routes connecting Local routes to Te Awa and Regional routes, and supporting connections to key destinations such as schools	Busy roads with speed limits around 50 km/h. Routes generally within urban areas.	Likely to serve modest volumes of pedestrians and cyclists	Walkable streets with footpaths on both sides of the street, connected by safe crossings at pedestrian desire lines. Cycling infrastructure will be route specific, and may consist of separated cycleways, shared paths, or low-speed low-volume cyclable local streets. Existing streets will generally need to be retrofitted with these facilities to fulfil this role.
Local routes (not mapped)	Walkable and cyclable local streets, enabling everyday trips to schools, to local destinations, and onward trips about the wider network	Local streets or off-road shortcuts. Generally within urban areas.	Likely to serve lower numbers of pedestrians and cyclists than other routes	Walkable streets with footpaths on both sides of the street, connected by safe crossings at pedestrian desire lines. Dedicated cycle infrastructure not generally provided, but cycling likely to be enabled instead by low traffic volumes in the order of 3,000 vehicles per day or less, and slow traffic speeds of 30 km/h or less. Existing local streets may need to be retrofitted with traffic calming, safer pedestrian crossings, and in some instances wider footpaths to fulfil this role.
Trails	Recreational	Generally through local reserves and natural spaces	Likely to serve lower numbers of pedestrians and cyclists than other routes	Walking paths, off road paths, multi-use tracks, cycle and mountain biking trails, and bridle/horse riding trails, as per the Connectivity Strategy

CONTENTS

1 INTRODUCTION

Flow has been commissioned by Waikato District Council (WDC) to conduct a transportation study for Ngaaruawaahia, Hopuhopu, Taupiri and Horotiu to understand how future growth until 2050 will affect the existing transport networks in these areas, as well as to undertake a high-level walking, cycling and micromobility assessment for Ngaaruawaahia, Hopuhopu, and Taupiri. Our assessment is divided into two parts: Part A focuses on traffic modelling and road network evaluation, while Part B (this report) assesses Micromobility/Walking/Cycling connectivity within and to/from the townships.

The intention of the assessment is to develop a network of routes for these modes within and connecting each of the 4 townships. The network aligns with each town's existing land use distribution and key destinations, and support future growth enabled by land use zoning. Our assessment has taken into consideration:

- Existing travel patterns and behaviours
- Existing land use development and key destinations such as schools, local centres, areas of employment, community facilities and recreational destinations
- Anticipated future land use development
- The existing transport network
- Anticipated future changes to the transport network.

2 THE EXISTING TRANSPORT NETWORKS

2.1 Land use and key destinations – Ngaaruawaahia

Figure 1 and Figure 2 show the existing transport network, land use and key destinations in Ngaaruawaahia, and are referenced in the sections that follow.

Figure 1: Ngaaruawaahia – Aerial view and existing transport network

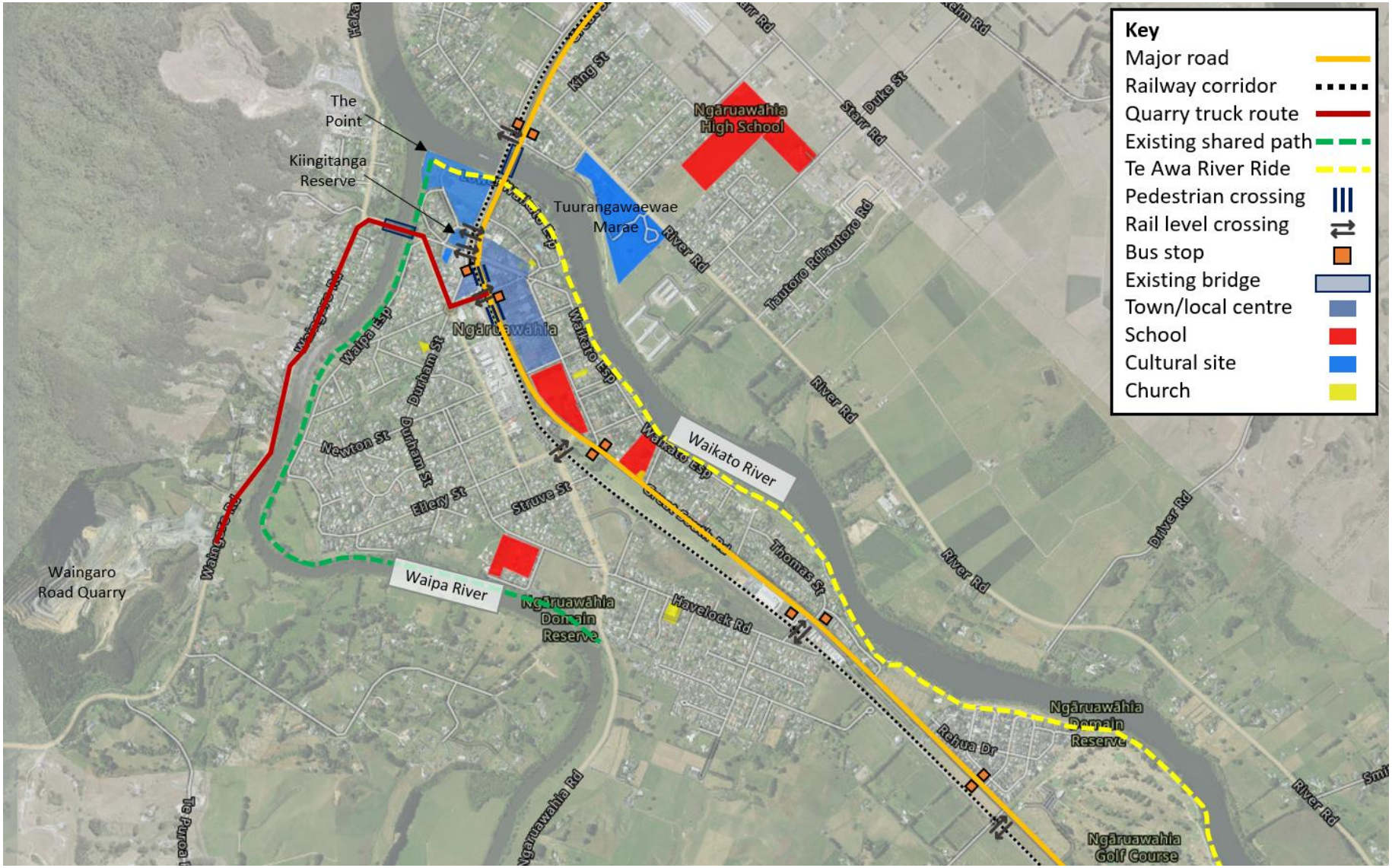
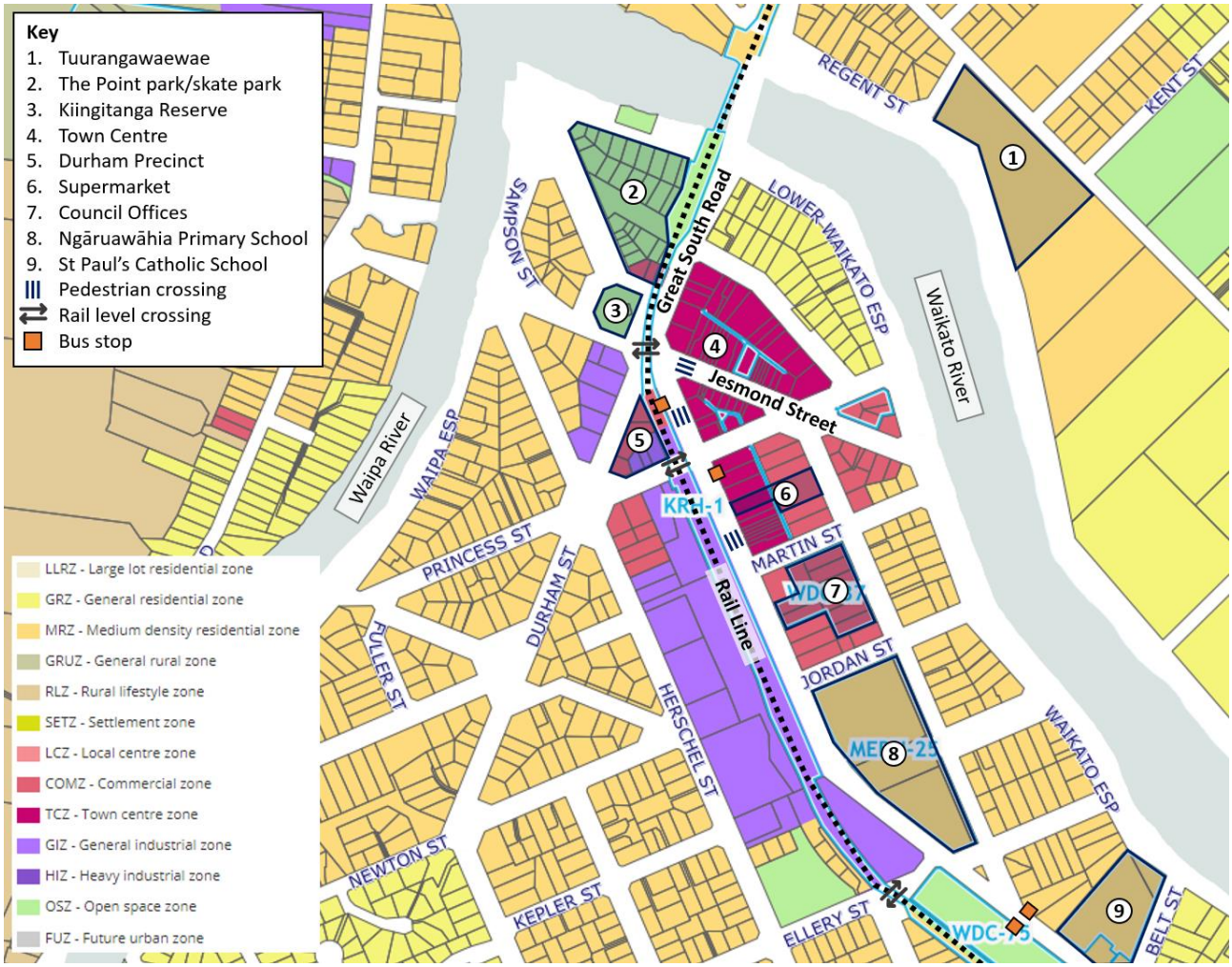


Figure 2: Ngaaruawaahia Town Centre - Land use and key destinations[1]



2.1.1 Zoning

The majority of Ngaaruawaahia is made up of medium density residential and general residential zones, with a large area of commercial and industrial land use located on Great South Road and the rail line.

2.1.2 Town Centre and employment areas

The Ngaaruawaahia Town Centre is the retail, food and beverage and employment centre of Ngaaruawaahia. The town centre generally sits on the eastern side of Great South Road, as shown in Figure 2. Jesmond Street is Ngaaruawaahia's main street, which currently connects to Great South Road via a left-in left-out intersection. A New World supermarket is located further south on Galileo Street, as are the Waikato District Council Offices – a key employer in Ngaaruawaahia.

To the west of Great South Road and the rail line the recently established Durham Precinct houses a variety of businesses, cafes and eateries, as well as a bike and e-bike hire business. There is also a large industrial area providing a variety of jobs.

[1] https://enterprise.mapimage.net/IntraMaps21B/?configId=4773e32d-66d0-4755-a825-a9313c15040d&project=Waikato&module=PDP%20-%20Decisions%20Version

Outside of the town centre there are small commercially zoned blocks to the north on Great South Road and to the west on Waingaro Road which serve as local centres with convenience stores and takeaways.

2.1.3 Schools and churches

There are 5 schools in Ngaaruawaahia – four primary schools and one secondary school[2]:

- Ngaaruawaahia High School is located to the north-east of the town centre (see Figure 1) and has a roll of approximately 300 students
- Te Kura Kaupapa Māori o Bernard Fergusson is located adjacent to Ngaaruawaahia with approximately 170 students
- Ngaaruawaahia Primary School and St Paul's Catholic School are located on Great South Road, south of the town centre, and have approximately 80 and 120 students respectively
- Waipa School is located further south on Havelock Road (see Figure 1) with approximately 370 students.

There are 6 churches in Ngaaruawaahia. These can be seen in Figure 1 and include two on Jesmond Street in the town centre and one connected to St Paul's Catholic School.

2.1.4 Marae and significant cultural destinations

Tuurangawaewae Marae is located across the Waikato River from the Ngaaruawaahia Town Centre to the north-east. Tuurangawaewae is a place of great significance as the home of Te Kiingitanga movement.

Other significant locations, Tuurangawaewae House and Kiingitanga Reserve are located on Eyre Street to the west of the rail line, south of The Point reserve.

Other Maaori Sites of Significance (MSOS) and Maaori Areas of Significance (MAOS) within Ngaaruawaahia include:

- Historic borrow pits at 5851 Great South Road
- Kaitotehe and Tukupoto Paa Hakarimata Road
- Te Pepepe Paa Hakarimata Road
- Puke-i-aahua Paa and Gardens Havelock Road.

2.2 Land use and key destinations – Taupiri

Figure 3 and Figure 4 show the existing transport network, land use and key destinations in Taupiri, and are referenced in the sections that follow.

[2] Information regarding school rolls obtained from Education Counts: https://www.educationcounts.govt.nz/find-school?&region=3&district=13#fas-search-section-specific

Figure 3: Taupiri – Aerial view and existing transport network

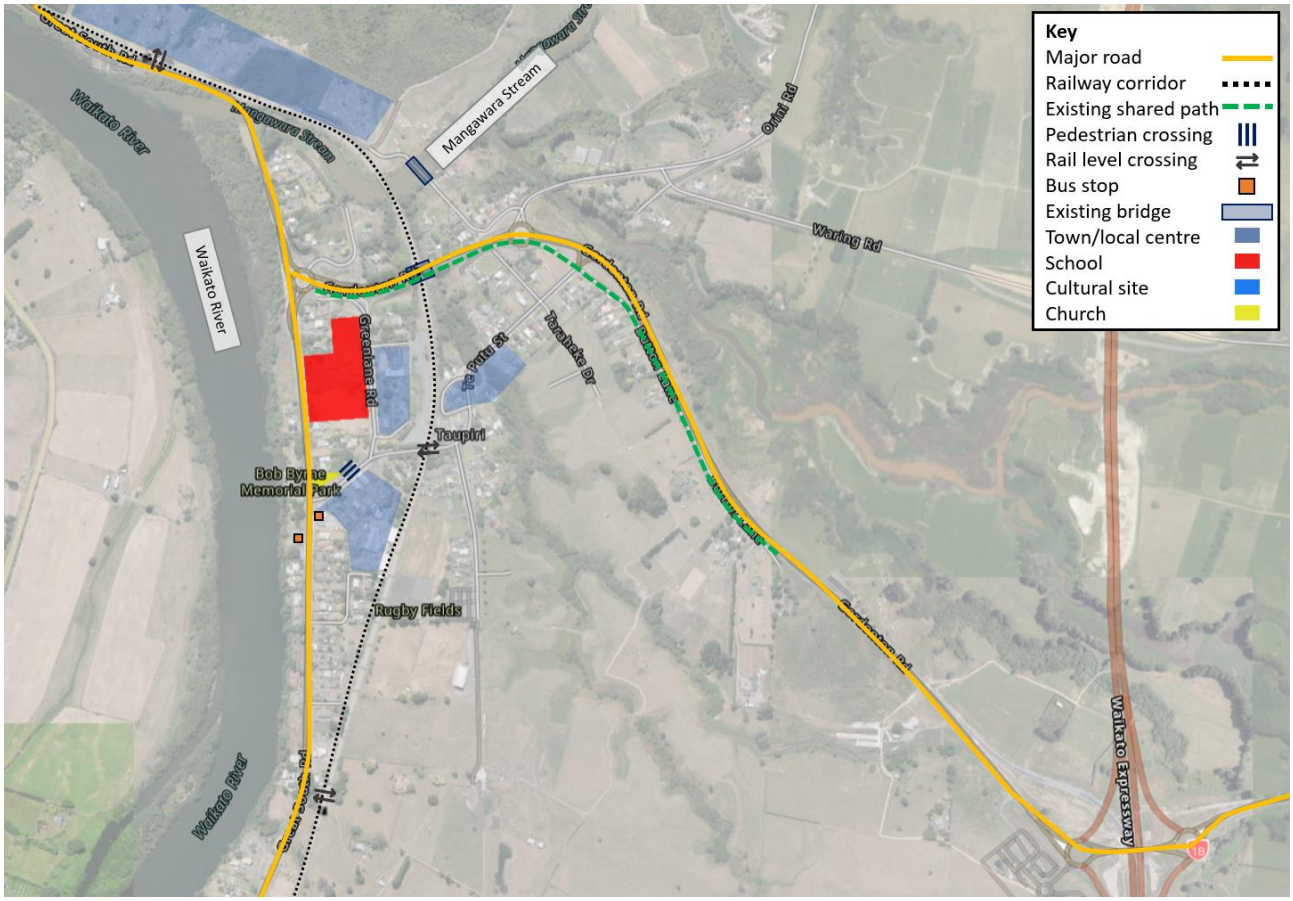
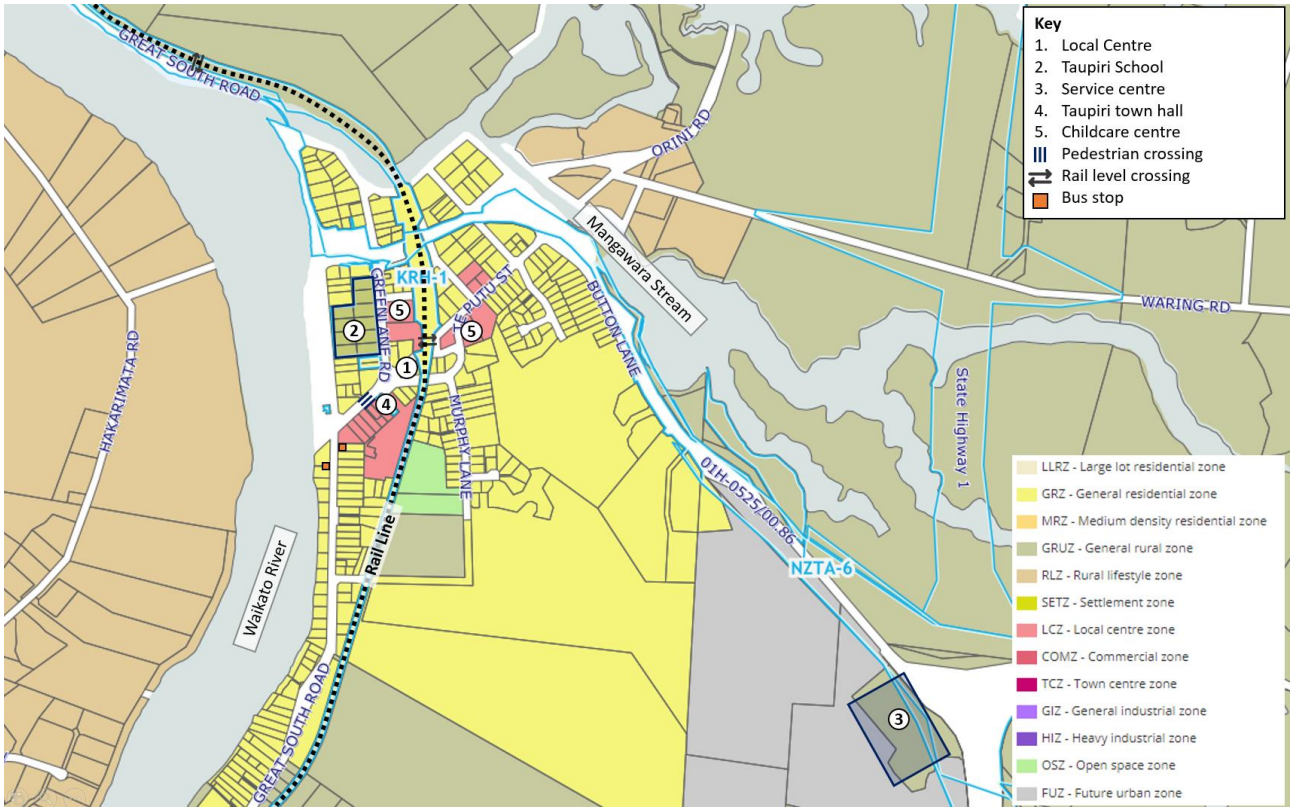


Figure 4: Taupiri – Land use and key destinations



2.2.1 Zoning

Taupiri is largely zoned for general residential use, with some land zoned as a local centre on Te Putu Street. The area around Taupiri is generally zoned for rural use, with a large section of land to the southwest zoned for Future Urban use (near the motorway interchange). We note that this zoning is currently under appeal, and may become live zoned in the short term.

2.2.2 Local Centre and employment areas

The Taupiri Local Centre is spread along Te Putu Street, and features a dairy, an early childhood education centre and a tavern.

Taupiri motorway interchange and service centre, located around 2.5 km southwest of the local centre, has a range of services targeted at users of State Highway 1, including a petrol station, a café and several fast-food restaurants.

2.2.3 Schools and churches

Taupiri School is located between Great South Road and Green Lane Road and is the only school in Taupiri with around 80 students. There is likewise one church in Taupiri at the intersection of Great South Road and Te Putu Street. There are currently 2 childcare centres within Taupiri, both within the centre of the township.

2.2.4 Marae and significant cultural destinations

Taupiri Marae is around 1.5 km south of Taupiri local centre near the intersection of Great South Road and Kainui Road, as indicated on Figure 3. Taupiri Maunga and Urupa are both located immediately north of the township, on the north bank of the Waikato River and Mangawara Stream. The Maunga and Urupa are both of very high significance to iwi.

2.3 Land use and key destinations – Hopuhopu

Figure 5 and Figure 6 show the existing transport network, land use and key destinations in Hopuhopu.

Figure 5: Hopuhopu – Aerial view and existing transport network

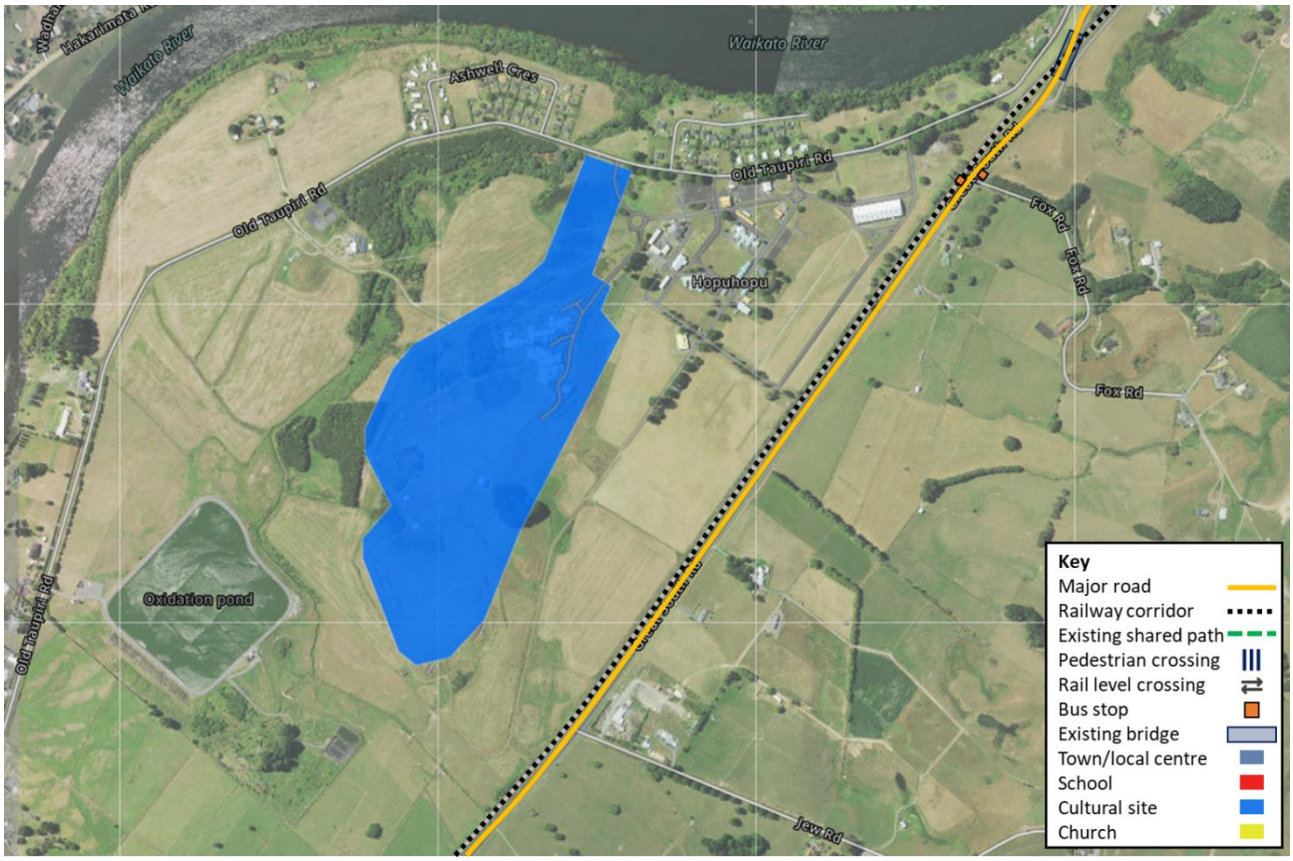
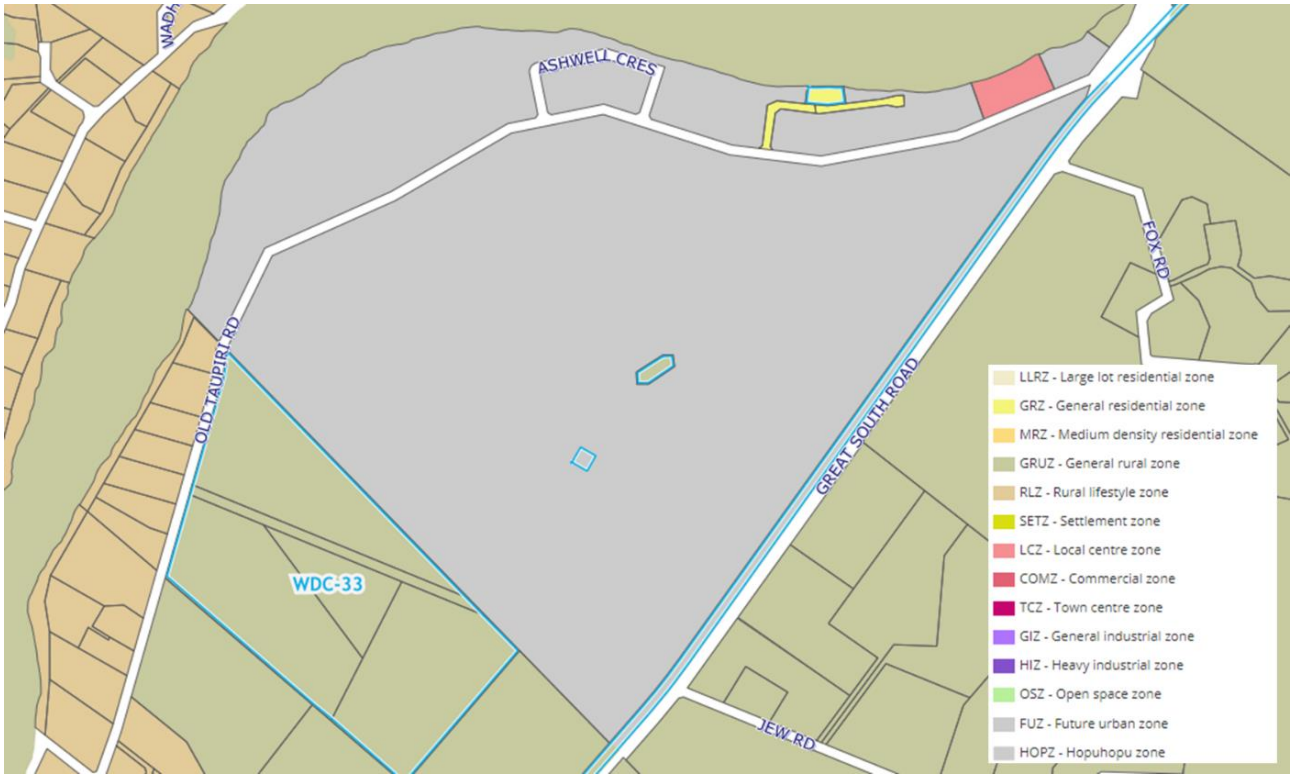


Figure 6: Hopuhopu – Land use and key destinations



2.3.1 Zoning

Hopuhopu is a former army base which was returned to Waikato-Tainui in 1993. A special purpose zone (HOPZ Hopuhopu Zone) has been established to enable Waikato-Tainui to promote their spiritual, educational, cultural, social, economic and environmental interests.[3] There is a small area of Local Centre zone on Old Taupiri Road, near the intersection with Great South Road.

2.3.2 Marae and significant cultural destinations

A large section of Hopuhopu is occupied by the Waikato-Tainui Hopuhopu Innovation Hub, a large precinct with a range of existing and planned functions including providing papakāinga, a native plant nursery, a sports and recreation precinct and a college for research and development.[4]

2.4 Land use and key destinations – Horotiu

Figure 7 and Figure 8 show the existing transport network, land use and key destinations in Horotiu.

[3] https://www.waikatodistrict.govt.nz/docs/default-source/your-council/plans-policies-and-bylaws/plans/district-plan-review/decisions/proposed-waikato-district-plan-(decisions-version)/part-3-area-specific-matters/special-purpose-zones/part-3_18-hopz-hopuhopu-zone.pdf?sfvrsn=57e59ac9_2

[4] https://waikatotainui.com/what-we-do/hopuhopu-innovation-hub/

Figure 7: Horotiu – Aerial view and existing transport network

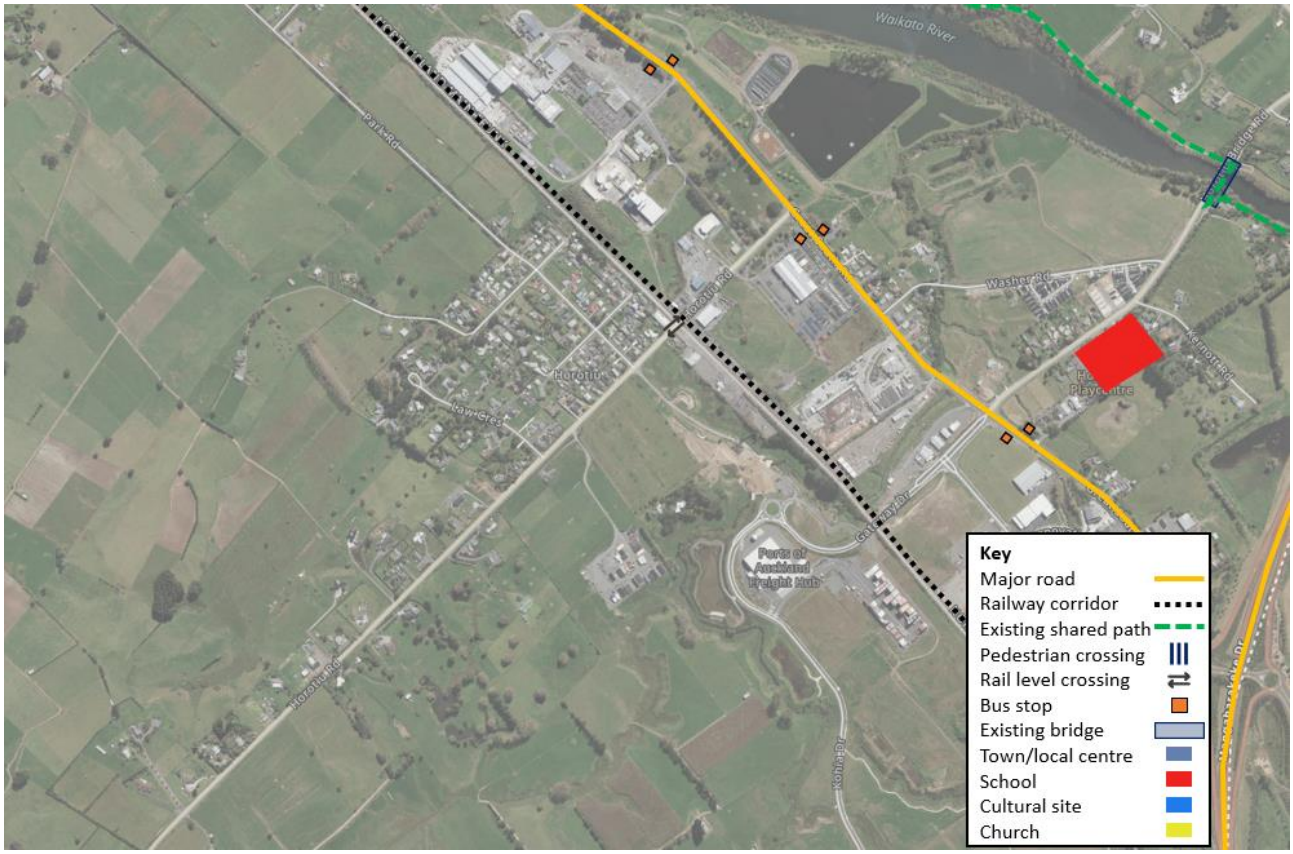
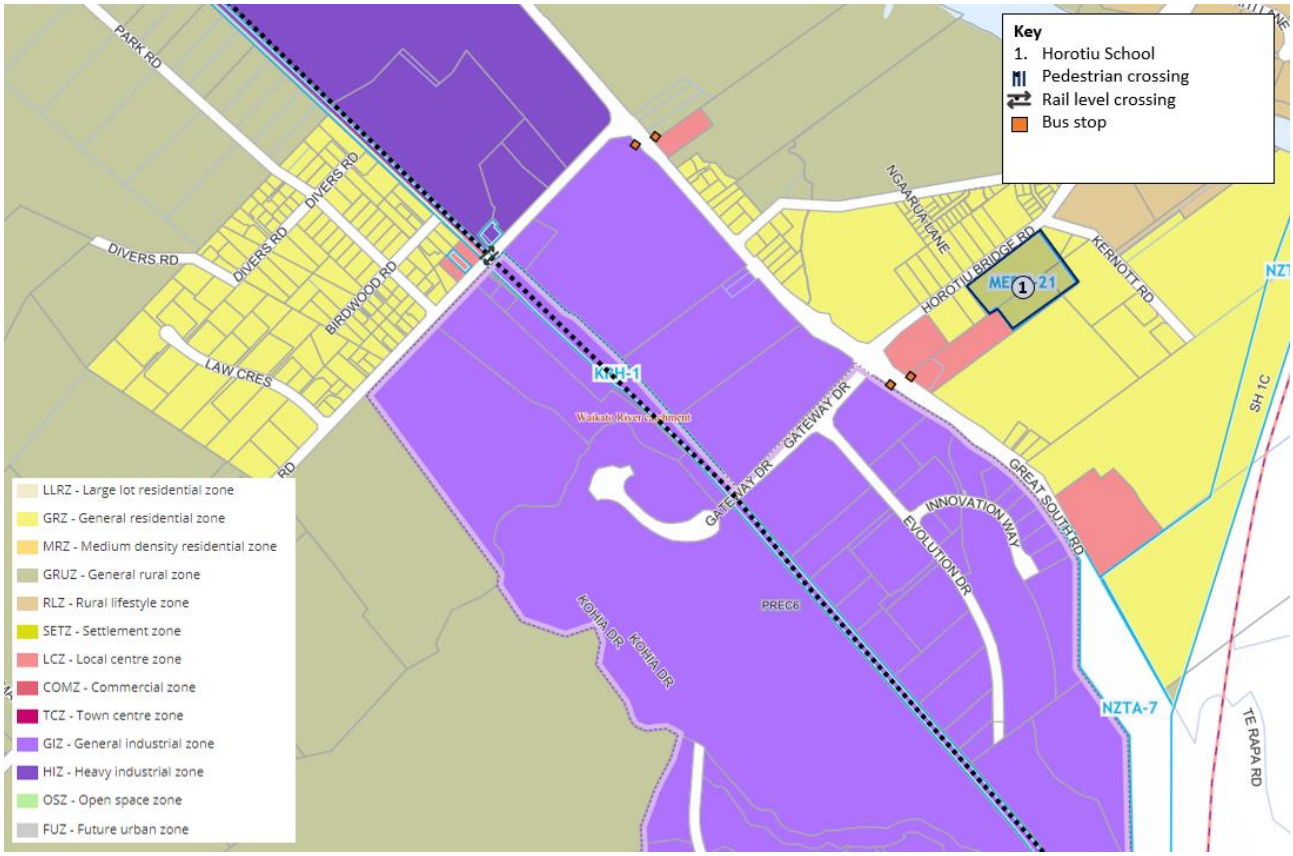


Figure 8: Horotiu – Land use and key destinations



2.4.1 Zoning

Horotiu consists of a mixture of existing residential and industrial zones, with a large undeveloped but live zoned land to the east and south. There are 4 small scale Local Centre zones strung out along Great South Road, and on Horotiu Road. Notably, there is an existing primary school on Horotiu Bridge Road, but this school is severed from the existing residential development by both Great South Road and the rail corridor.

2.5 Public transport

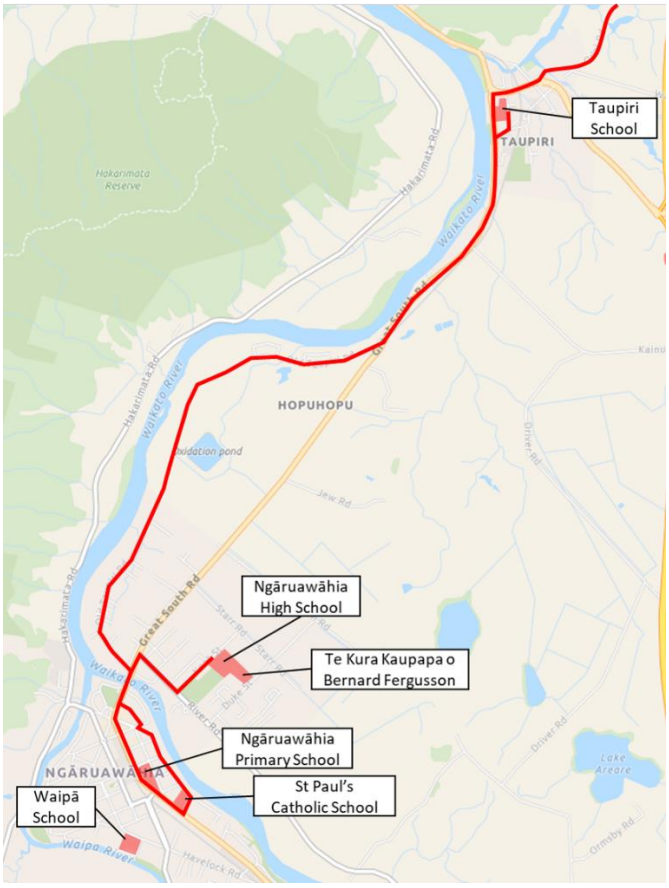
Ngaaruawaahia, Hopuhopu, Taupiri and Horotiu are served by one public bus route and one school bus route, shown in Figure 9 and Figure 10 respectively.

The Northern Connector route (route 21) operates between Huntly and Hamilton seven days a week, with one daily service running to Pukekohe on weekdays. The Northern Connector runs approximately once every hour through the day, and approximately every 20-30 minutes at peaks. The route follows Great South Road through Taupiri, Hopuhopu, Ngaaruawaahia and Horotiu, stopping in Taupiri Town Centre (see Figure 3), near Hopuhopu at Fox Road, at 5 locations in Ngaaruawaahia (see Figure 1) and at Horotiu Road.

A single school bus route serves Ngaaruawaahia and Taupiri, travelling south from Taupiri School on Great South Road, before turning onto Old Taupiri Road and travelling through Hopuhopu to Ngaaruawaahia, where it circulates past Ngaaruawaahia Primary School and St Paul's Catholic School before travelling north on Great South Road to Ngaaruawaahia High School.

Figure 9: Northern Connector public bus route

Figure 10: Ngaaruawaahia and Taupiri school bus route



2.6 Walking and cycling networks

2.6.1 Existing walking and cycling facilities

Existing walking and cycling facilities in Ngaaruawaahia and Taupiri are shown on Figure 1 and Figure 3.

The Te Awa River Ride, shown in Figure 11 below, is a 65km concrete path connecting Ngaaruawaahia to Lake Karapiro via Hamilton. The trail begins at The Point in Ngaaruawaahia and follows the Waikato River south along the edge of Ngaaruawaahia, crossing the river at the recently completed Perry Cycle Bridge.

The Te Awa River Ride is predominantly a recreational cycle route but can potentially also serve commuter trips into Ngaaruawaahia from the south, and from Ngaaruawaahia (and Taupiri and Hopuhopu) to Hamilton (approximately 20km, or 1 hour by bike).

There is also a walking/cycling path running along the Waipā River to the west of Ngaaruawaahia, again starting at The Point and running south along the edge of the town past Waipā School where it meets Ngaaruawaahia Road.

Figure 11: Te Awa River Ride - Ngaaruawaahia to Karapiro

2.6.2 Barriers to walking and cycling

There are a number of physical barriers which limit walking and cycling accessibility within Ngaaruawaahia, Taupiri, Hopuhopu and Horotiu:

- Great South Road is a major arterial road with over 17,000 vehicles/day. Great South Road runs through the centre of Taupiri, Ngaaruawaahia and Horotiu, causing severance through all three towns.
    - Within Ngaaruawaahia, two pedestrian crossings over Great South Road are provided within the town centre, approximately 180m from one another, but these are not at intersections and do not align with crossing points over the rail corridor.
    - Within Taupiri, Great South Road severs the bulk of the township from the Waikato River, the northbound bus stop, and businesses on the west side of the road. There are currently no safe, accessible crossing points of Great South Road within Taupiri
    - In Horotiu, Great South Road severs Horotiu School and the Waikato River from the majority of the existing residential area. Safe and accessible crossings are available at the

Gateway Drive/Horotiu Bridge Road intersection, but not at the Horotiu Road intersection.

- The rail corridor runs adjacent to Great South Road through Ngaaruawaahia, Taupiri, Hopuhopu and Horotiu, causing further severance.
    - In Ngaaruawaahia, the rail corridor severs the town centre from the residential area to the west. There are two level crossings provided for pedestrians within the town centre, approximately 150m apart, but as mentioned above these do not line up with pedestrian crossings over Great South Road. Level crossings also present a trip or slip hazard, particularly for cyclists.
    - Within Taupiri, the rail corridor is crossed by two grade separated road crossings, each with pedestrian facilities. However, the southern of these, Te putu Street, has a very narrow footpath that is not fully accessible for some users and does not provide a safe route for cyclists.
    - In Horotiu, the existing Horotiu Road level crossing does not have pedestrian or cyclist facilities.
- Ngaaruawaahia town centre is situated between the Waikato and Waipa Rivers. While the two rivers provide opportunities for recreational pathways (such as the Te Awa River Ride) they also cause severance between the town centre and some of the surrounding trip generators, including Tuurangawaewae Marae, schools and residential areas. Opportunities to cross the rivers are very limited, particularly for pedestrians and cyclists, with only narrow pathways provided on the Great South Road bridge over the Waikato River and the Waingaro Road bridge over the Waipa River. There are no other bridges in the area apart from the Perry Cycle Bridge over the Waikato River 4km further south.
- The Waingaro Quarry is located southwest of Ngaaruawaahia on the opposite side of the Waipa River. Heavy vehicles travelling to and from the quarry pass through Ngaaruawaahia, travelling via the Waingaro Road bridge, Herschel Street and Princess Street to access Great South Road. Care must be taken to ensure proper separation between pedestrians and cyclists and heavy vehicles, particularly at intersections along this route.

2.6.3 Safety issues

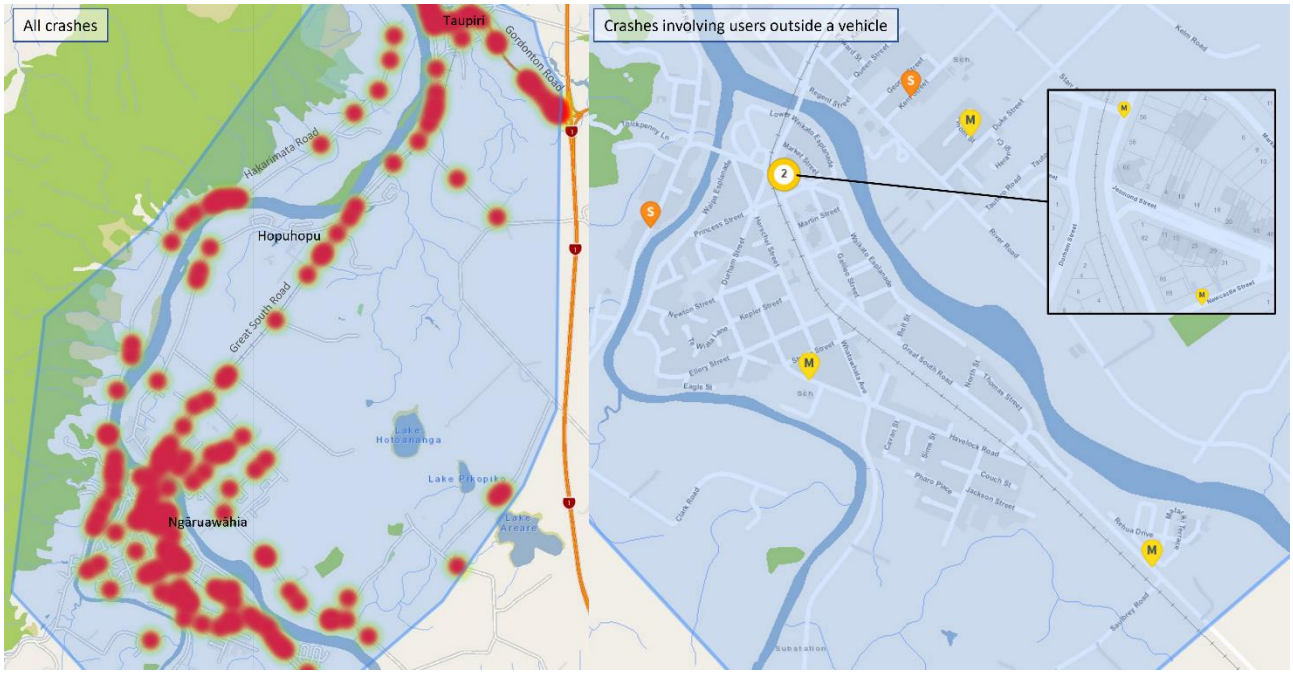
In order to identify safety issues in the project area we have assessed all reported crashes between 2017 and 2022 using Waka Kotahi NZ Transport Agency's Crash Analysis System (CAS). A total of 295 crashes were reported in the area, of which 22 were fatal or serious and the remainder were minor or non-injury crashes. Our key observations include:

- a large portion of reported crashes were located on Great South Road, Hakarimata Road and Gordonton Road. Great South Road in particular had a lot of crashes in both urban and rural areas
- serious crashes tended to occur in rural areas where speed limits are higher. Almost all of the serious crashes reported in urban areas happened on Great South Road

- the single site with the most reported crashes was the intersection of Great South Road and Newcastle/Princess Street, where around 15 crashes occurred over the period, although none of these were serious
- only 7 reported crashes involved road users outside a vehicle (pedestrians or cyclists), of which 2 were serious. All of these crashes occurred in Ngaaruawaahia, and 3 involved users on push scooters
- only 1 crash with a train was reported over the period, which occurred at the Princess Street level crossing

Figure 12 shows the locations of all reported crashes (left) and all reported crashes involving road users outside of a vehicle (right).

Figure 12: Ngaaruawaahia, Taupiri and Hopuhopu crash locations 2017-2022 (CAS)



2.7 Historical travel patterns – 2018 Census

Figure 13 and Figure 14 show where people who live and work in Ngaaruawaahia (shown in green in Figure 13) and the Taupiri-Lake Kainui area (shown green in Figure 14) commute to and from, and their main journey to work mode, as reported in the 2018 Census. We note that the Statistical Area 2 unit for Taupiri-Lake Kainui encompasses a large rural area to the southeast of Taupiri, so the data for Taupiri reflects travel patterns for this area as well as the town itself.

Our key observations from this data are as follows:

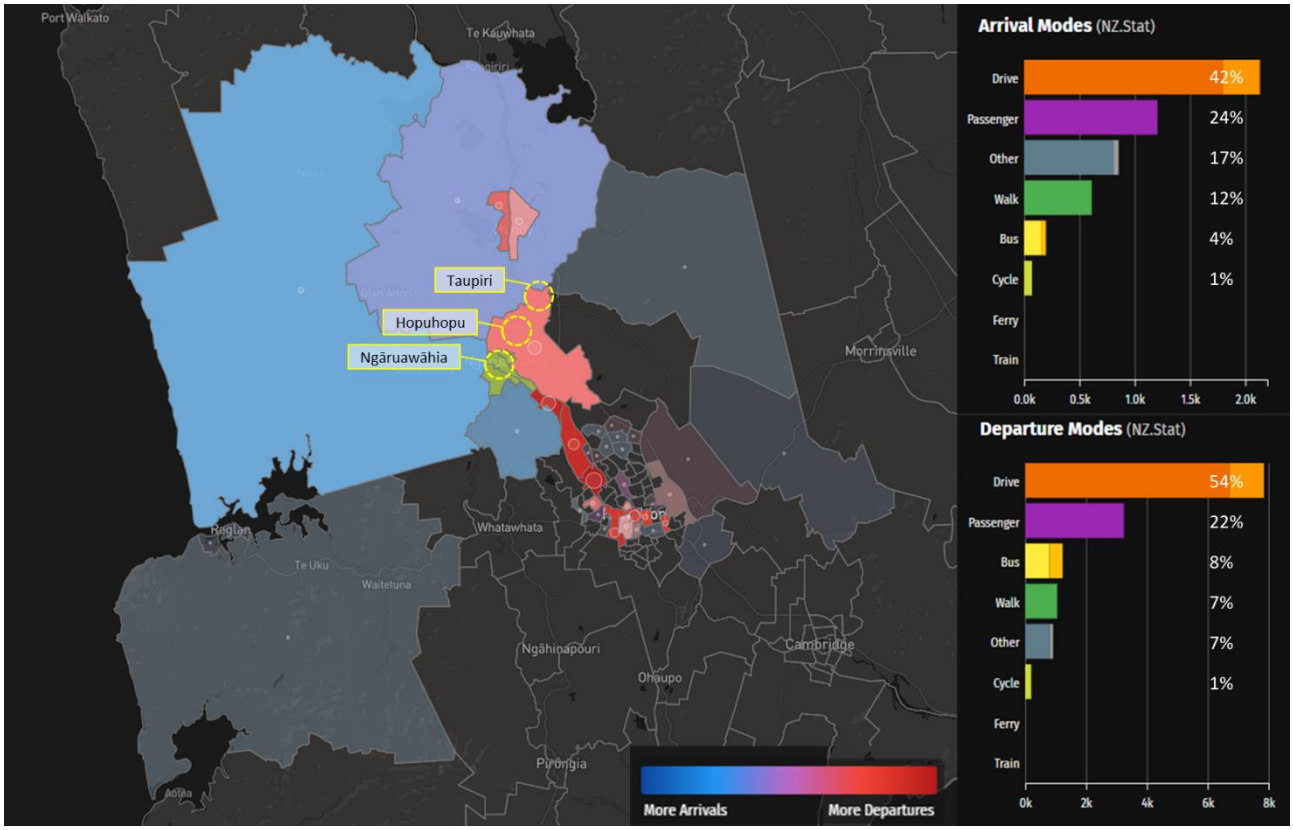
- roughly 1,000 Ngaaruawaahia residents (41%) commute within Ngaaruawaahia. Around half of these (504 people) are students. Roughly 260 people (37%) commute within the Taupiri-Lake Kainui area, of whom 57 are students

- 59% of people from Ngaaruawaahia and 73% of people from Taupiri-Lake Kainui commute to other areas. The majority of these commutes are towards Hamilton to the southeast
- A substantial number of people commute between Ngaaruawaahia and Taupiri, or travel from one area through the other to get to their destination (eg Ngaaruawaahia to Huntly via Taupiri)
- The majority of commuter trips to and from both areas are made by private vehicle (either as a driver or a passenger). 7% of commuter trips by Ngaaruawaahia residents are made by walking, compared to only 2% in Taupiri-Lake Kainui. Only 1% of people in either area make their commute trips by bike.

Our conclusions from this data include the following:

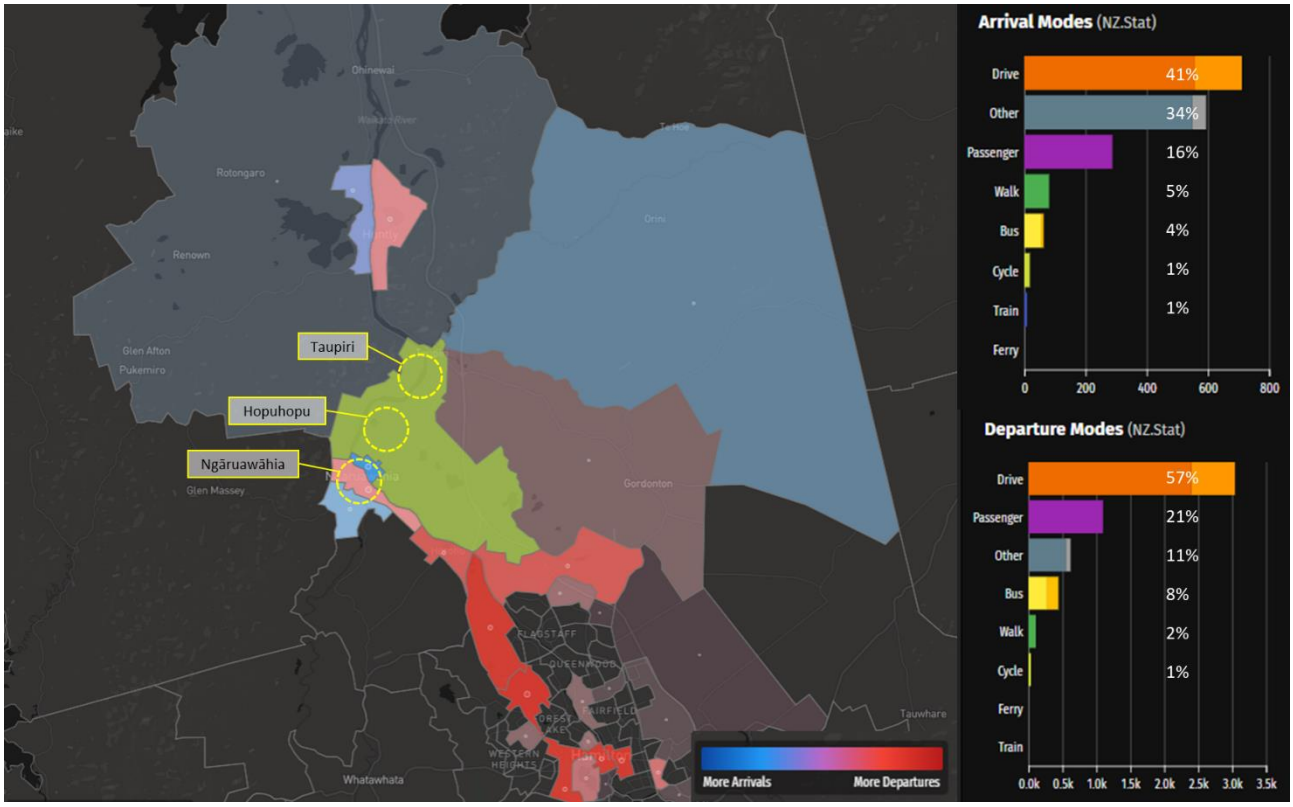
- a large portion of people live and work/study in the same area and are likely to make short journeys that are easily walkable or cyclable provided safe, convenient facilities are provided. This is particularly the case for Ngaaruawaahia, which is a smaller area with more urban land use
- a number of people commute between Ngaaruawaahia and Taupiri (around 7.5km) and Huntly further north (around 15km). These journeys could be made by bike if appropriate facilities were provided between Ngaaruawaahia, Hopuhopu and Taupiri
- many commuters also travel south from Ngaaruawaahia and Taupiri to Te Rapa and Hamilton, roughly following the Waikato River. Some of these journeys could potentially be made by bike using the Te Awa River Ride.

Figure 13: Arrivals to and departures from Ngaaruawaahia for work and education (2018 Census)[5]



[5] Statistics New Zealand. (2020). https://commuter.waka.app/

Figure 14: Arrivals to and departures from the Taupiri-Lake Kainui area for work and education (2018 Census)[6]



3 THE PROPOSED TRANSPORT NETWORK

3.1 Land use changes

Refer to the accompanying report "Ngaaruawaahia, Taupiri, Hopuhopu and Horotiu – Transport Assessment"[7], also prepared by Flow, for information on future land use changes.

3.2 Future public transport/rapid transit

Refer to the accompanying report "Ngaaruawaahia, Taupiri, Hopuhopu and Horotiu Transport Assessment", also prepared by Flow, for information on future public transport changes.

3.3 Proposed walking and cycling improvements

The Waikato District Council Connectivity Strategy 2023 (the Connectivity Strategy) outlines existing and proposed walking and cycling trails in the Waikato District. The Connectivity Strategy mapped out recreational trails that provide access to nature and link green spaces, but also mapped key urban connections linking destinations. Trails in the strategy play a role in providing wider connectivity

[6] Statistics New Zealand. (2020). https://commuter.waka.app/
[7] Flow Transportation Specialists. (November 2023). Ngaaruawaahia, Taupiri, Hopuhopu and Horotiu– Transport Assessment.

between the Ngaaruawaahia Town Centre and the surrounding area. Figure 15 (overleaf) provides an overview of the existing and proposed trails in the vicinity of Ngaaruawaahia and Taupiri.

Existing trails in the townships include the Te Awa River Ride running along the western bank of the Waikato River, footpaths along Great South Road, portions of trail along the Waipa River and several short sections of path in residential areas of Ngaaruawaahia.

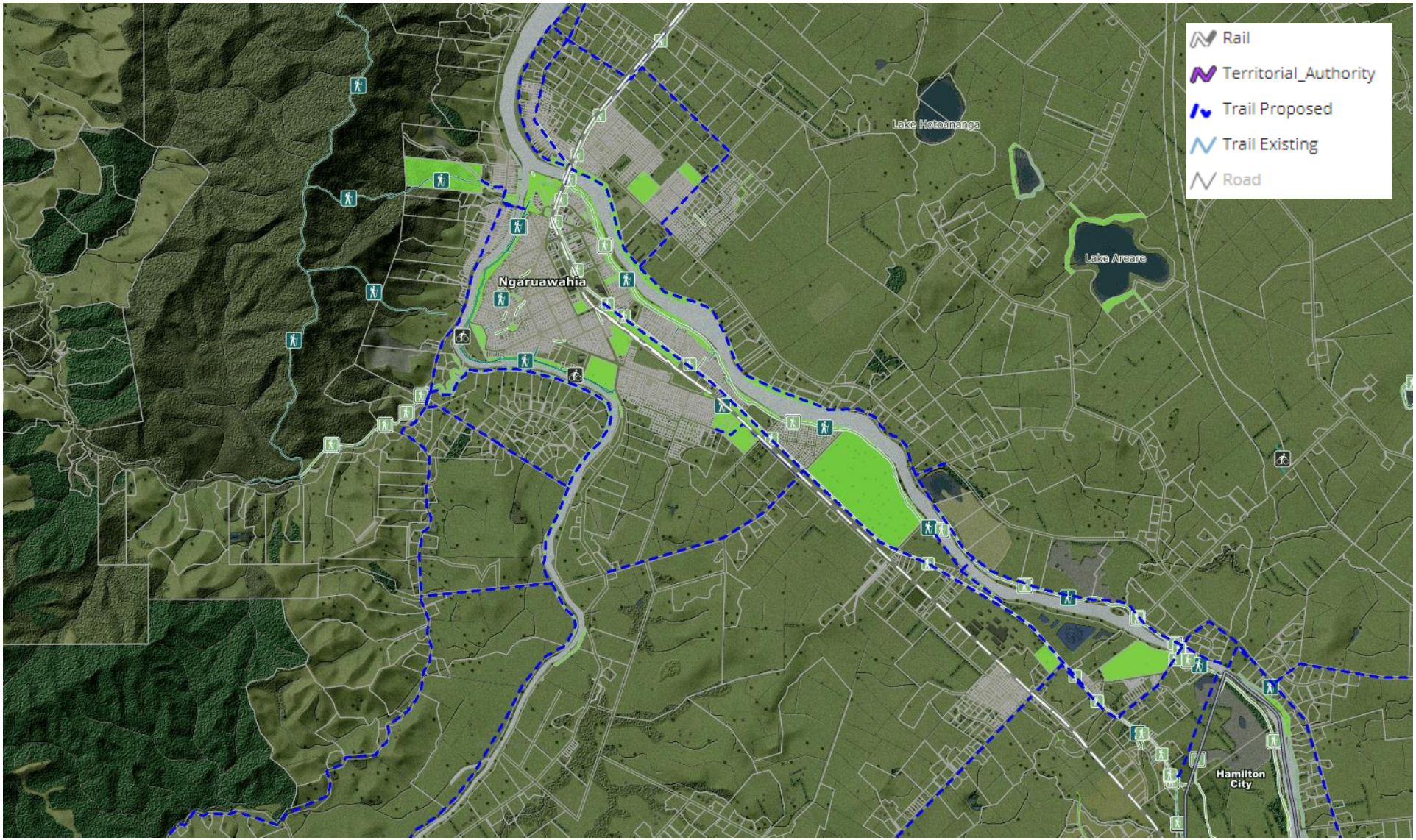
A range of new trails are proposed in the Connectivity Strategy, documented below in Table 1. Only three of the proposed routes in this area were considered high priority.

Table 1: Waikato District Council Connectivity Strategy 2023 - New routes proposed near four townships

Number	Route	Type	Priority
254	Taupiri river walk		High
255	Ngaaruawaahia River East		High
256	Waipa River 1		Low
257	Waipa River 2		High
276	Waipa River		High
298	Ngaaruawaahia High		High
300	Ngaaruawaahia Te Puroa Road Clark Road		Medium
301	Ngaaruawaahia Duke Jacobs Lane		Medium
314 & 326	Huntly Taupiri link		High
315	Waingaro Road footpath		High
392	Te Kowhai – Horsham Downs connection	Multi-use	High
395	Taupiri – Cemetary to Mangawara Bridge	Multi-use	Medium
396	Great South Road to Te Awa	Multi-use	Medium
408	Button lane cycle extension	Multi-use	Low
409	Mangawara Stream	Multi-use	Medium
424	Connection to paa	Multi-use	High
425	Great South Road to service centre	Footpath	Low
428	Ngaaruawaahia to Taupiri connection	Multi-use	Medium
429	Jackson to Ngaaruawaahia Road	Footpath	High
430	Great South Road south	Multi-use	Medium
432	Ngaaruawaahia to Horotiu	Multi-use	Medium
460	Hakarimata to town	Multi-use	High

Figure 15: Waikato District Council Connectivity Strategy 2023 - Existing and proposed trails in Taupiri and Hopuhopu

Figure 16: Waikato District Council Connectivity Strategy 2023 - Existing and proposed trails in Ngaaruawaahia and Horotiu



3.4 Other proposed transport improvements

A number of other transport improvements are proposed in the project area, and we summarise those improvements and their proposed staging in Table 2 below. Further details on these improvements and others, as well as the approximate proposed staging, are documented in the Ngaaruawaahia, Taupiri, Hopuhopu and Horotiu – Transport Assessment report.

Table 2: Proposed investments in the wider transport network

Short-term (0 – 5 years)	Medium term (5 – 15 years)	Long-term (15+ years)
INTERSECTIONS		
Upgrade the existing **Great South Road intersection with Jesmond Street** to a roundabout to deliver connection to the town centre.	Upgrade the **Jesmond Street/Newcastle Street** intersection to manage cyclist and pedestrian safety and reduce speeds as well as deliver connection to the town centre	
Upgrade the Great South Road intersection with Old Taupiri Road (south) to roundabout	Upgrade the Great South Road intersection with River Road to roundabout	
Upgrade Princess Street/GSR intersection	Upgrade the **Market Street and Great South Road intersection** to reduce speeds through this intersection to help support the low-speed zone south of the intersection	
LEVEL CROSSINGS		
Upgrade the pedestrian level crossing at **Jesmond Street** during the upgrade of the Jesmond Street intersections.	Upgrade the level crossing at **Old Taupiri Road, unless** north Ngaaruawaahia Hopuhopu is developed earlier	Upgrade level crossing at **Kainui Road, unless** the Taupiri development takes place prior. Then upgrade along with Taupiri development.
Closure of the **Horotiu Road** and level rail crossing following the completion of Kohia Drive, encouraging use of the grade separated crossing of the NIMT at Gateway Drive		Close the level crossing at **Wallbank Road**, once growth cell is developed, providing access to Old Taupiri Road
Closure of the **Waingaro Road** level rail crossing to formalise the required heavy vehicle movements from the Waingaro Road Quarry and encouraging use of Princess Street (requires Princess Street/GSR intersection upgrade)	Upgrade the **Havelock Road** level crossing	Monitoring and review safety at the **Havelock Road** level crossing
Upgrade the level crossing at **Princess Street** when the level crossing at Waingaro Road, is closed	Upgrade the level crossing at **Saulbrey Road**	Monitoring and review safety at the **Saulbrey Road** level crossing

Table 2: Proposed investments in the wider transport network

Short-term (0 – 5 years)	Medium term (5 – 15 years)	Long-term (15+ years)
NGAARUAWAAHIA TOWN CENTRE – OTHER IMPROVEMENTS		
Create a defined **entryway/town centre gateway** at the northern and southern extents with kerb buildouts, raised platforms and visual cues	Provide an **improved walking and cycling connection** across Great South Road and the NIMT to connect east and west Ngaaruawaahia	
Introduce a **speed limit of 30 km/h** for key town centre streets supported with engineering features	Provide an **improved walking and cycling connection** along Great South Road and across the Waikato River	
Provide a **low-speed environment** (30 km/h) within the town centre, including on sections of Great South Road, Market Street and Martin Street.	Traffic calming measures to be implemented on **Herschel Street** to discourage rat running via Herschel Street	
Reroute the over-dimension vehicle route along Great South Road		
Undertake safety improvements to **existing pedestrian crossing points** of Great South Road within the town centre, either signalised crossings or raised zebra crossings.		
Interim traffic calming measures on sections of Great South Road through the town centre, using **tactical urbanism** to provide affordable yet effective traffic calming measures that support the low-speed limits, the low-speed environment	Provide more permanent traffic calming measures	
TAUPIRI TOWN CENTRE		
Introduce a **lower speed limit** along Te Putu Street and Greenlane Road		
Introduce some **raised platforms** to support lower speeds, especially at busier pedestrian crossing locations		
PUBLIC TRANSPORT		
Work with WRC on infrastructure improvements to support bus services along Great South Road.	Work with WRC to deliver Bus Rapid Transit (BRT) to support land use development	Reinstate the train station at Ngaaruawaahia to align with the Hamilton to Auckland (H2A) Corridor Plan.

Table 2: Proposed investments in the wider transport network

Short-term (0 – 5 years)	Medium term (5 – 15 years)	Long-term (15+ years)
		Upgrade the existing bus stops and enable the rapid transit route, aligning with the Hamilton Waikato Metropolitan Spatial Plan (HWMSP).

In addition to the above, Waikato District Council are investigating options to provide a new walking and cycling bridge across the Waikato River at Ngaaruawaahia, using the disused bridge piers of the former rail bridge.

4 RECOMMENDED ACTIVE MODE NETWORKS

4.1 Our approach to route hierarchies and intervention priorities

Our approach to developing the recommended active modes and micromobility network is as follows:

1. Identify and map key trip generators/attractors that need to be connected (see Sections 2.1 to 2.5)
2. Identify and map existing walking and cycling facilities and barriers to walking and cycling (see Section 2.6)
3. Develop an active mode hierarchy according to the following scale:
    - The **Te Awa River Ride** along the Waikato River, that provides a north-south spine for the region as well as a primary recreational route
    - **Regional connections** that provide connectivity between Ngaaruawaahia, Hopuhopu and Taupiri, which form the spine of the network
    - **Core routes** that provide the main links between key trip generators/attractors
    - **Local routes** to connect provide access to individual homes and destinations. We have not mapped local routes, as all local streets need to be walkable and cyclable, to fulfil this role in the network
    - **Trails** that provide walking and cycling routes through public reserves and natural spaces.
4. Prioritise interventions according to:
    - **Existing routes** that already align with best practice for walking, cycling and micromobility
    - **Short to medium term interventions** that address an immediate concern or are fundamental to the network, and
    - **Longer term interventions** that will be enabled or justified by future changes in land use or changes to the wider transport network.

Table 3 outlines the characteristics and types of walking and cycling facilities we would expect to see on each of the different routes from the hierarchy. In general, designs should target a Quality of Service (QoS) 1 or 2 in line with Auckland Transport's practitioner's guide for evaluation QoS for cycle facilities.[8]

[8] https://at.govt.nz/media/1973340/cycle-facilities-quality-of-service-evaluation-guide.pdf

Table 3: Route hierarchy and type of facility

Route type	Function	Environment	Users	Type of Facility
Te Awa and Regional routes	Major routes connecting town centres and used for longer journeys	Busier, higher speed arterial roads, or in the case of off-road routes, parallel to them. Routes traverse both urban and rural areas.	Combination of utility trips (trips to education, employment, and other destinations), recreational riders and cycle tourers. Likely to serve high volumes of cyclists.	Off-road routes with little or no conflict with general traffic. May be shared paths or separated walking and cycling paths. On-road routes using the street network where conflict with general traffic is managed. Likely to include both footpaths and cycle infrastructure that are separated from general traffic, with appropriate safe crossing locations. Safe (raised or signalised) crossings at intersections and priority to active modes across driveways.
Core routes	Second tier "feeder" routes connecting Local routes to Te Awa and Regional routes, and supporting connections to key destinations such as schools	Busy roads with speed limits around 50 km/h. Routes generally within urban areas.	Likely to serve modest volumes of pedestrians and cyclists	Walkable streets with footpaths on both sides of the street, connected by safe crossings at pedestrian desire lines. Cycling infrastructure will be route specific, and may consist of separated cycleways, shared paths, or low-speed low-volume cyclable local streets. Existing streets will generally need to be retrofitted with these facilities to fulfil this role.
Local routes (not mapped)	Walkable and cyclable local streets, enabling everyday trips to schools, to local destinations, and onward trips about the wider network	Local streets or off-road shortcuts. Generally within urban areas.	Likely to serve lower numbers of pedestrians and cyclists than other routes	Walkable streets with footpaths on both sides of the street, connected by safe crossings at pedestrian desire lines. Dedicated cycle infrastructure not generally provided, but cycling likely to be enabled instead by low traffic volumes in the order of 3,000 vehicles per day or less, and slow traffic speeds of 30 km/h or less. Existing local streets may need to be retrofitted with traffic calming, safer pedestrian crossings, and in some instances wider footpaths to fulfil this role.
Trails	Recreational	Generally through local reserves and natural spaces	Likely to serve lower numbers of pedestrians and cyclists than other routes	Unsealed off road walking and biking trails

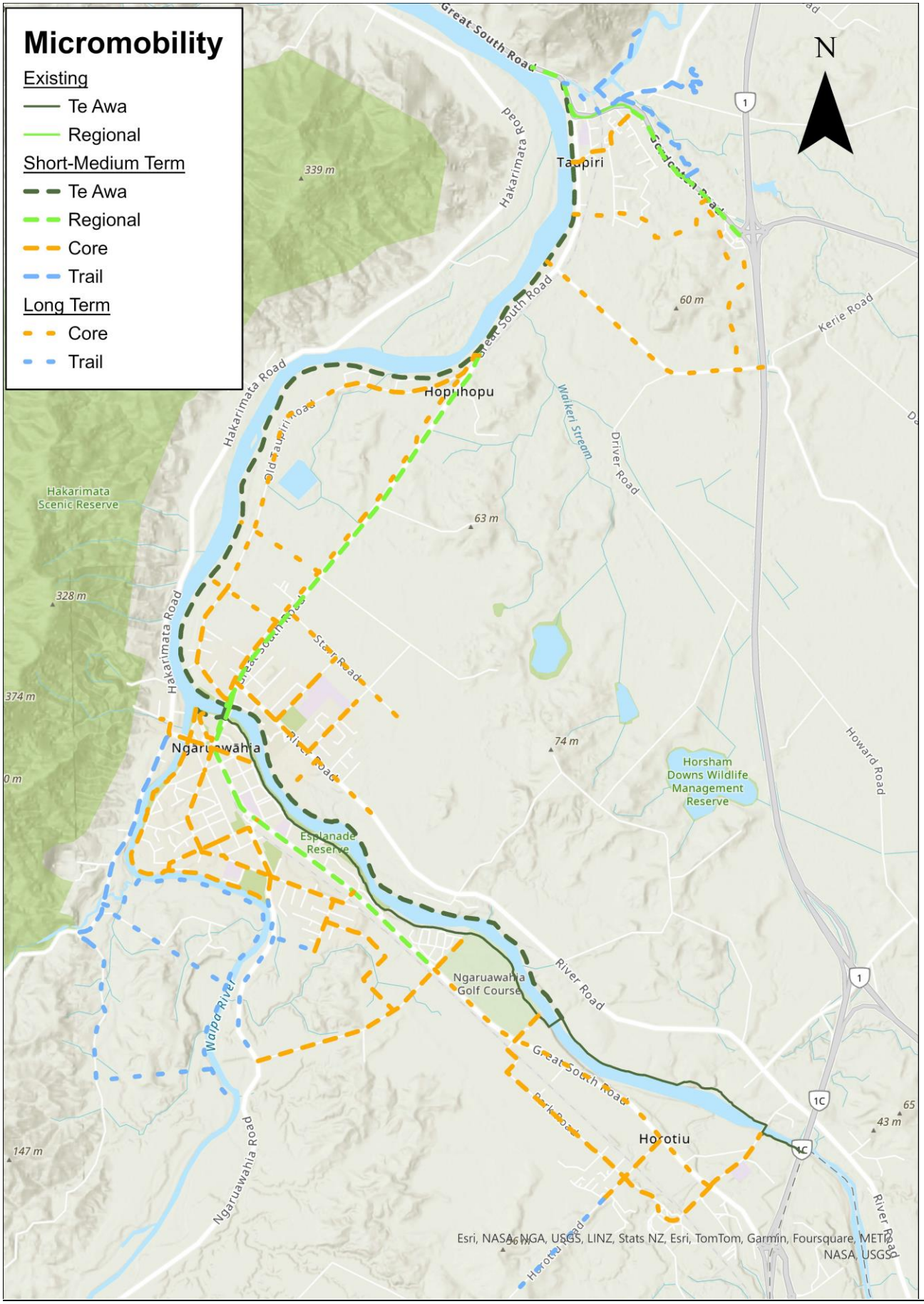
4.2 Our recommended active mode network

Our recommended active mode network is shown in Figure 17 overleaf. More detailed maps are appended to this report.

When viewing the proposed active mode network, it is important to recognise that it includes ***walking, cycling and micromobility networks***, combined. While these three modes are often grouped together as "active modes", they differ significantly in terms of their infrastructure requirements. Walking networks tend to be very fine grained, and include all streets within an urban area. By contrast, cycling networks tend to be more skeletal, with fewer urban streets represented. As a result, where we have identified a street as a priority within the overall active mode network, in some cases this may consist of walking infrastructure alone.

We do not know the future road network layout within the proposed growth cells but have provided some indicative future connections that would be beneficial through growth cells where there are no existing roads. We have assumed that where new roads are delivered or significant upgrades are made to existing roads to facilitate development, these will include safe and appropriate walking and cycling facilities.

Figure 17: Proposed active mode network (refer Appendix A for high resolution maps)



4.3 Regional Connections

Regional connections include Te Awa River Ride along the banks of the Waikato River, as well as primary strategic connections between urban areas. Both are shown as darker green colours in the proposed active mode map. The Regional network will generally consist of high quality footpaths and cycleways, or in some cases shared use paths, where conflict with general traffic is carefully managed and priority is given to active modes.

4.3.1 Ngaaruawaahia to Hopuhopu

The Ngaaruawaahia to Hopuhopu section extends from the east bank of the Waikato River in Ngaaruawaahia (where it will tie-in to the existing Great South Road bridge or a new walking and cycling bridge) to the intersection of Great South Road and Old Taupiri Road just north of Hopuhopu.

A significant amount of land use growth is planned for this area on both sides of the railway line. The railway line presents a significant challenge in this area as there are only three crossings over the railway line, two of which have no provision for pedestrians or cyclists.

We have considered four potential connections between Ngaaruawaahia and Hopuhopu:

- Option A: Great South Road – walking and cycling path(s) along Great South Road (route 428 in the Connectivity Strategy)
- Option B: Old Taupiri Road – walking and cycling path(s) along Old Taupiri Road (route 427 in the Connectivity Strategy)
- Option C: Waikato River – walking and cycling path(s) along the east bank of the Waikato River (routes 255 and 326 in the Connectivity Strategy). While other sections of Te Awa River Ride have a focus on recreational trips, there is the potential for this section to serve multiple trip types, avoiding the need for multiple routes each serving different purposes
- Option D: West of railway line – new connection following the western side of the railway corridor

It is difficult to provide a single connection that caters to all existing land use and growth cells due to the distance between the growth cells and the lack of walking and cycling connections across the rail line. Requiring people to backtrack to access a safe facility (ie go south to cross the rail line and travel north) is likely to deter many people from walking or cycling.

For the greatest uptake of walking and cycling for trips between Ngaaruawaahia, Hopuhopu and Taupiri, we recommend providing a direct connection on/adjacent to Great South Road and a shared path connection along the Waikato River. This provides:

- a direct connection between Ngaaruawaahia and Taupiri on Great South Road which facilitates longer distance, commuter cycling trips
- a recreational route along the river which extends Te Awa River Ride and is fully separated from traffic
- similar connectivity benefits to an Old Taupiri Road connection, providing a connection to Ngaaruawaahia and Taupiri for the growth cells west of the rail line

- a choice between the more direct Great South Road route and the higher amenity river route for people living in the growth cells along Great South Road and Old Taupiri Road, particularly if more safe crossings are established over the rail line.

4.3.2 Hopuhopu-Taupiri

The Hopuhopu-Taupiri connection extends from the northern intersection of Great South Road and Old Taupiri Road to the intersection of Taupiri Road and Gordonton Road at the north of Taupiri town.

The two obvious options for a Hopuhopu to Taupiri connection are a connection via Great South Road or a connection along the Waikato River. There is little difference between the two routes in terms of directness or connectivity as they run close together at this point. The Waikato River route would provide higher amenity and has stronger recreational potential, whereas a route on Great South Road may be better suited to utility cycling (ie trips to school, work, and other destinations). However, given the proximity of the two routes it does not seem necessary to deliver two connections.

It is recommended that the Te Awa River Ride be extended further north, capitalising on the recreational and cycle tourism benefits of the existing Te Awa route. However, irrespective of which route is selected the design will need to be cognisant of the different kinds of potential users, ranging from higher-speed commuters and sports cyclists to families and children using the path recreationally.

4.3.3 Taupiri Interchange

Our proposed network includes completion of the Taupiri Community Shared Pathway, between the town centre and the SH1 Taupiri service centre. The purpose of this regional route is to connect Taupiri's future eastward urban expansion to the town centre, and to connect to any future rapid transit hub in this location. We note that part of this route is already complete, and subsequent stages are funded.

4.3.4 Ngaaruawaahia

Within Ngaaruawaahia itself, the existing Te Awa River Ride fulfils an important recreational and cycle touring function along the western bank of the Waikato River. However, it bypasses Ngaaruawaahia's town centre and much of the township itself. As such, it is poorly suited to local trips to employment, education and other local walking, cycling and micromobility trips within Ngaaruawaahia.

We recommend a Regional route via Great South Road between Saulbrey Road and Old Taupiri Road form the main north-south strategic walking, cycling and micromobility connection through Ngaaruawaahia township. This recognises that Ngaaruawaahia's key destinations are concentrated along this route, and that Great South Road is a "spine" for the Ngaaruawaahia urban area, linking a range of origins and destinations, for multiple trip types and modes. It recognises that the same reasons that make Great South Road attractive for general traffic – directness, convenience and connectivity – make it attractive for cycling and micromobility trips too.

4.3.5 Ngaaruawaahia to Horotiu

The existing Te Awa River Ride provides a regional, recreational connection between Ngaaruawaahia and Horotiu. However, this link:

- Bypasses Horotiu, by crossing to the east bank of the Waikato River at the Perry Cycle Bridge, some 1.5 km north of Horotiu, and
- Does not cater very well to utility trips (trips to education, employment and other destinations), as, by following the river, it skirts around the outside of Ngaaruawaahia's urban area

However, given the scale of existing and future land use within Horotiu, and the dispersed trip patterns, we have not recommended a new Regional link within Horotiu. Instead, we recommend a network of Core connections within Horotiu and connecting to Te Awa. Refer Section 4.7.

Our active mode map also includes a new regional recreational route on the east bank of the Waikato River, from the Perry Cycle Bridge to Old Taupiri Road. This facility, as identified by the Connectivity Strategy, would mirror the existing Te Awa River Ride and provide bike access to the key destination of Tuurangawaewae.

4.4 Core active mode network – Ngaaruawaahia

4.4.1 Ngaaruawaahia North

For the purposes of our assessment, we have defined this area as the area north of the Waikato River but south of Kelm Road as shown previously in Figure 1. This area includes existing residential areas and growth cells on both sides of the railway line, and key destinations including Tuurangawaewae, Ngaaruawaahia High School and Te Kura Kaupapa o Bernard Fergusson.

East of the rail line we recommend providing core routes on River Road, Duke Street and Kent Street. Initially we suggest only extending these routes as far as Ngaaruawaahia High School, with further extensions to be delivered in conjunction with development. When development occurs along Starr Road, it will also be beneficial to provide a core route on Starr Road linking back to Great South Road.

West of the rail line we recommend providing an initial core route on Old Taupiri Road and Galbraith Street as far as Jacobs Lane (as proposed in the Connectivity Strategy).

4.4.2 Ngaaruawaahia Central

Within central Ngaaruawaahia, we have recommended a Core active mode network that includes part of the following streets:

- Durham Street
- Havelock Road
- Ellery Street
- Whatawhata Avenue
- Waikato Esplanade/Jesmond Street/Eyre Street/Waingaro Road

Collectively, these streets provide critical walking and cycling access to key destinations including Waipa Primary School, Ngaaruawaahia Primary School, the town centre and the employment area immediately south of it, bus stops on Great South Road, and to possible future rapid transit station (Refer to the accompanying report "Ngaaruawaahia, Taupiri, Hopuhopu and Horotiu Transport Assessment"). They

also provide an east-west connection between Te Awa River Ride, the town centre, Great South Road and Waingaro Road. The east-west Core route would bring walkers and riders from Te Awa into the heart of Ngaaruawaahia, "The Point", and onto recreational routes along the Waipa River and into Hakarimata.

4.4.3 Ngaaruawaahia South

Within Ngaaruawaahia south, we have recommended a Core route on Saulbrey Road, to enable the significant land use growth anticipated within this growth cell. We recommend that this link extend eastward onto Te Awa, and while we have shown this via a new route using an existing paper road, this could equally use the existing street network within the River Terraces development (eg Matariki Terrace).

4.5 Core active mode network – Taupiri

Core walking and cycling routes within Taupiri include parts of Kainui Road and Te Putu Street. We have also recommended new routes that bisect the large future urban area of Taupiri, and connect the future rapid transit hub at Taupiri interchange to Great South Road (west) and to Kainui Road (south). We note that these Core walking and cycling routes may not exactly follow the exact paths shown, if the future urban street networks provided during this area's urbanisation differ. The principle however, of connecting Taupiri interchange to urban areas west and south via Core walking and cycling routes, remains.

4.6 Core active mode network - Hopuhopu

The Core walking and cycling network within Hopuhopu consists of 2 routes: one via Old Taupiri Road and a second route running parallel to and immediately west of the rail corridor. We note that the latter of these routes would run parallel to, and in close proximity to, Great South Road, which we have already identified as part of the proposed Regional network. However, these 2 routes would be separated by the rail corridor. If multiple, regularly spaced, safe pedestrian and cyclist crossing points are provided across the rail corridor, only one of these 2 routes will be necessary to ensure land uses on each side are connected to the walking, cycling and micromobility network.

4.7 Core active mode network – Horotiu

Our proposed Core network within Horotiu focuses on providing connections from the township's existing and future residential areas to Horotiu School, to local employment area, and to regional connections via Te Awa. This includes parts of:

- Great South Road
- Horotiu Road
- Horotiu Bridge Road
- Gateway Drive
- Park Road.

4.8 Local route network

Local streets are a critical part of the walking, cycling and micromobility network, as they provide access to the individual places that people live, work, study, shop and engage in recreation. We have not mapped the local route network in our walking, cycling and micromobility maps, as every local street fulfils this function to at least some degree.

Not all of Ngaaruawaahia's, Taupiri's, Hopuhopu's and Horotiu's local streets will align with current best practice for local streets however, due to issues such as footpath widths, and safe and accessible crossings that meet the needs of all footpath users. Similarly, while traffic volumes are typically low on local streets, traffic speeds do not necessarily align with the 30 km/h operating speed that would allow the street to be considered cyclable by a wide range of people.

We recommend that existing local streets be reviewed to consider whether they meet the needs of people travelling by active modes.

APPENDIX A The proposed active mode network

Figure 18: Proposed active mode network - Ngaaruawaahia

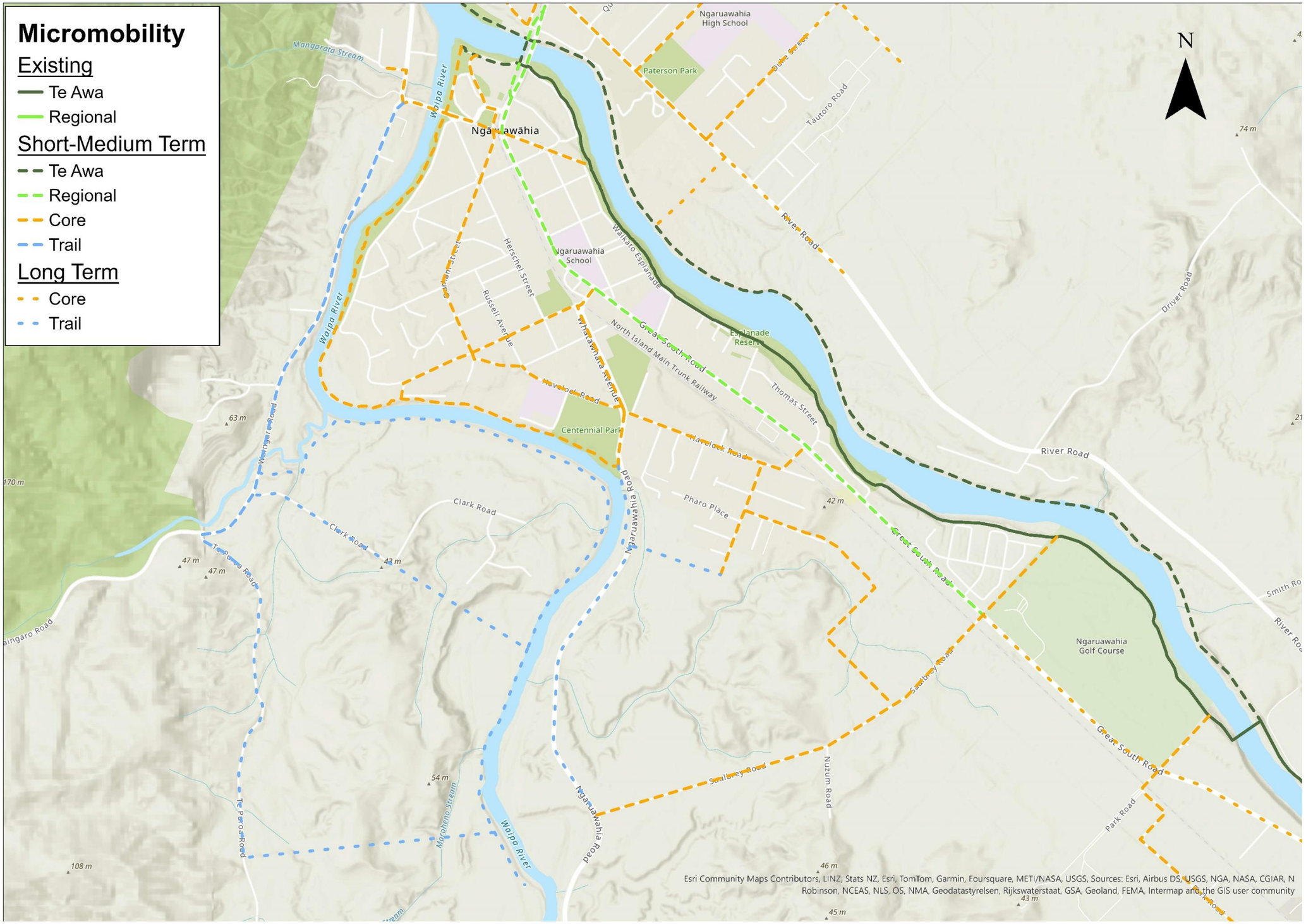


Figure 19: Proposed active mode network - Hopuhopu

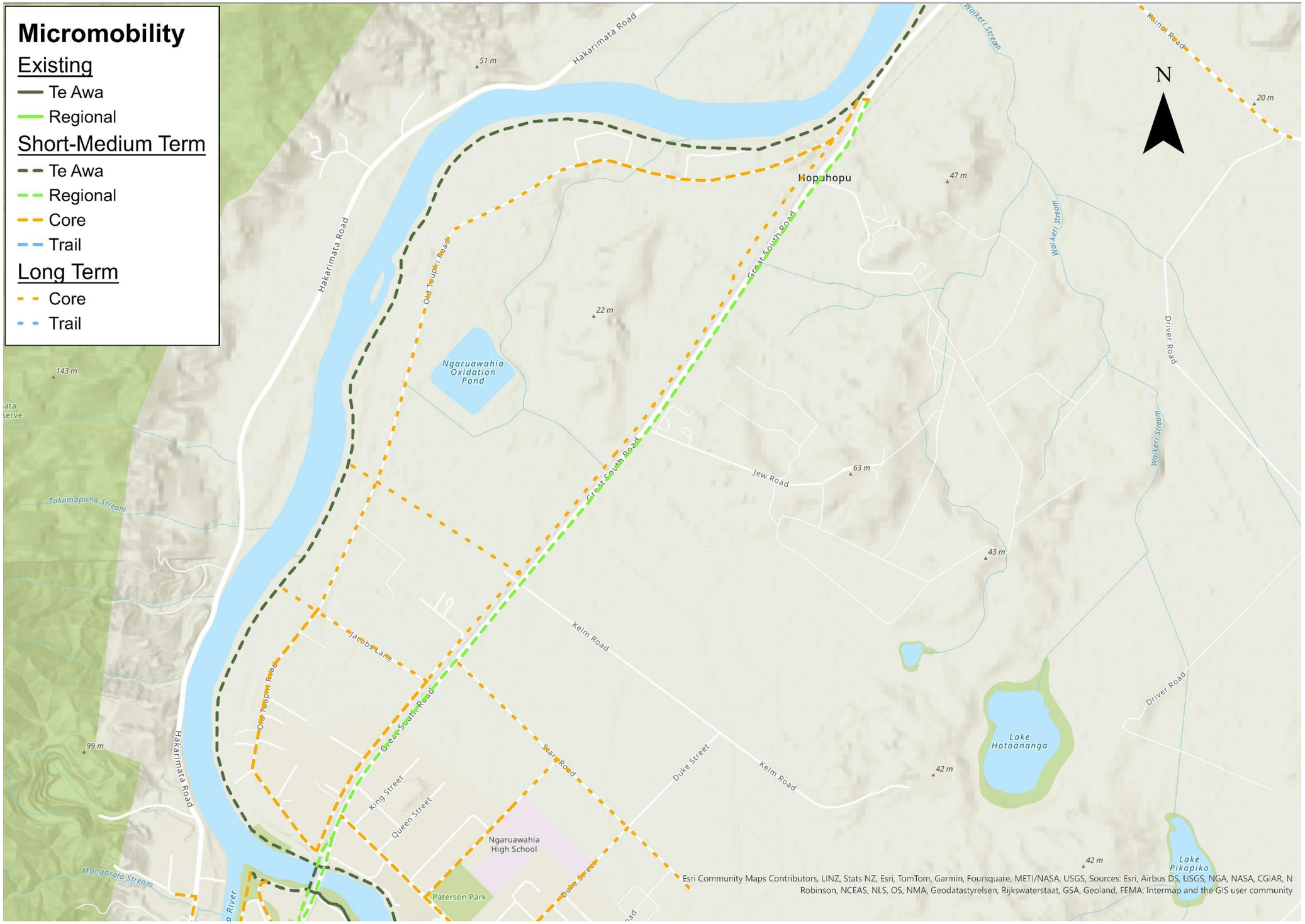


Figure 20: Proposed active mode network - Taupiri

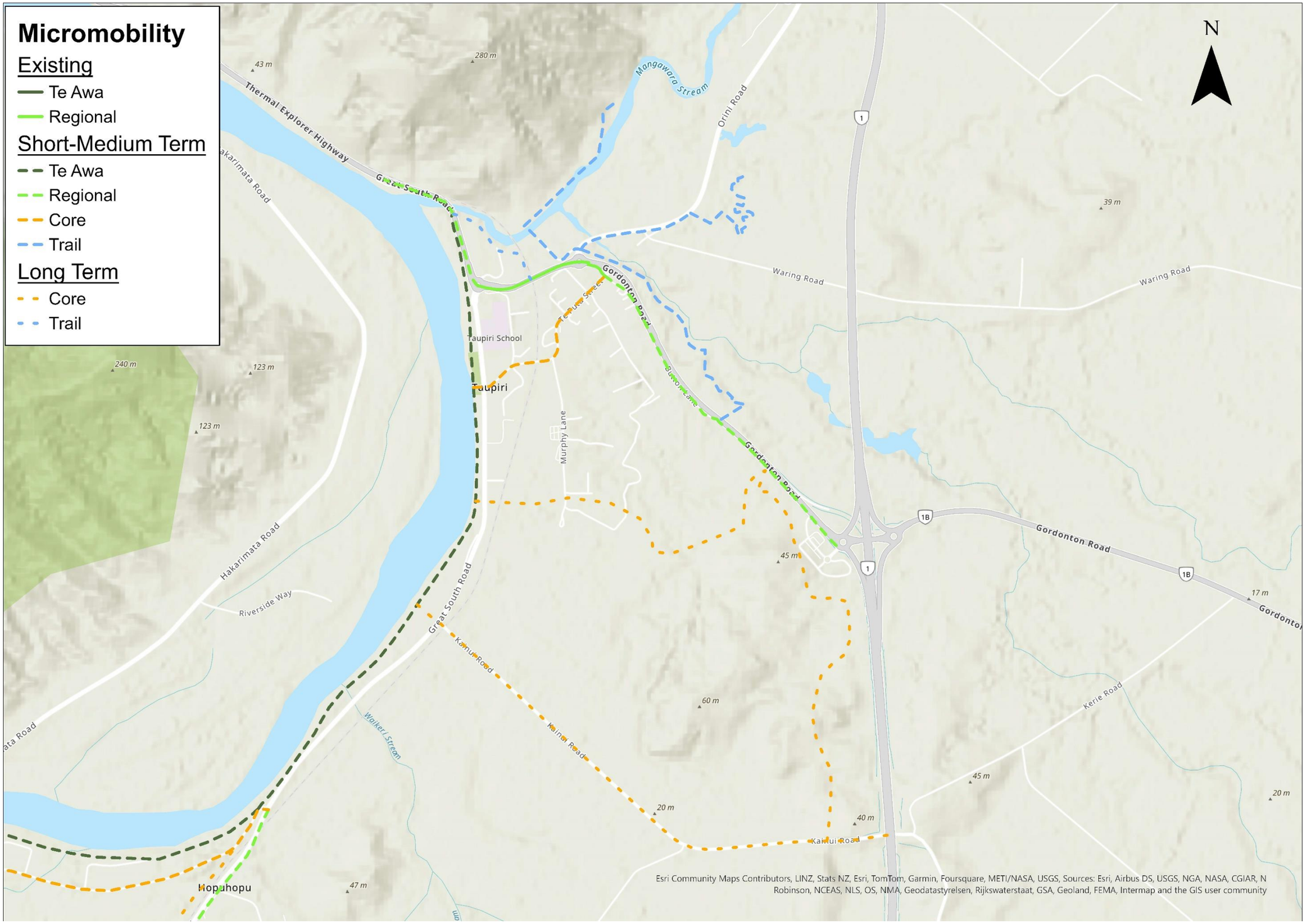


Figure 21: Proposed active mode network - Horotiu