Our Places

Eastern Bay Spatial Plan

Scenarios and Development Options Report

June 2025

BAY OF PLENTY REGIONAL COUNCIL TOI MOANA

WHAKATĀNE District Council
Kia Whakatāne au i ahau

KAWERAU DISTRICT COUNCIL
Te Kaunihera ā rohe o Kawerau

Ōpōtiki District Council
STRONG COMMUNITY STRONG FUTURE

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Contents

Figures

Tables

Appendices

1 Introduction

The Scenarios and Development Options Report examines how the Eastern Bay of Plenty's ("Eastern Bay") settlement patterns can evolve to meet future needs over the next 30 years. It presents the used to determine the best way to coordinate a new residential and business land supply. This report is an essential evidence base for Our Places – Eastern Bay Spatial Plan (referred to as "the Spatial Plan" or "Our Places").

1.1 National Policy Statement on Urban Development

The Eastern Bay includes areas that are Tier 3 urban environments under the National Policy Statement on Urban Development 2020 (NPS-UD). This policy requires provision of sufficient development capacity for housing and business land.

The geographical scope of this report and Our Places is the local authority areas for Kawerau, Whakatāne and Ōpōtiki (referred to as "Eastern Bay" or the "sub-region"). The NPS-UD applies to all local authorities that have all or part of an urban environment in their district. It has different implementation requirements for different tiers of local authorities, based on the population size and growth rate of their urban environments. The NPS-UD lists the Tier 1 and 2 local authorities, while all other districts that are not listed and include an urban environment[1] in their district are considered Tier 3 local authorities. Every tier 1, 2, and 3 local authority is required to use evidence-based decision making for urban environments in their region or district.

The Eastern Bay includes a cross-council housing and business land market which is considered an urban environment for the purposes of the NPS-UD. This area includes the urban areas of Whakatāne township, Kawerau district and Ōpōtiki township. The figure below identifies the main requirements under the NPS-UD for the Eastern Bay. This report focuses on the evidence base for assessing the demand and providing for sufficient development capacity.

[1] NPS-UD 2020 defines urban environment to mean any area of land (regardless of size, and irrespective of local authority or statistical boundaries) that: is, or is intended to be, predominantly urban in character; and is, or is intended to be, part of a housing and labour market of at least 10,000 people.

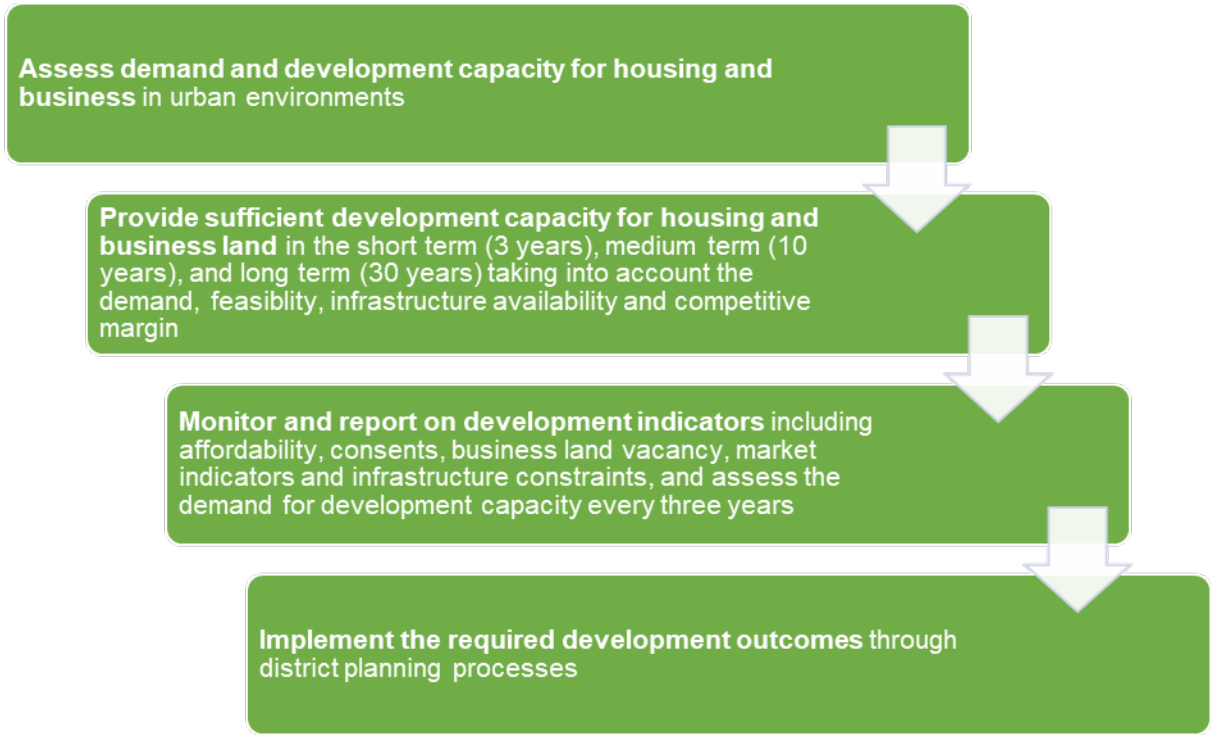

Figure 1: The main NPS-UD requirements for the Eastern Bay

1.2 Report structure

The Scenarios and Development Options Report is divided into the following four sections:

Context: This section outlines details about the sub-region, covering the sub-regional activity corridors that exist and are defined by urban population density, economy and transport connections. This context section also addresses complex land interests, environmental considerations, population growth and economic data, all that are relevant influences on determining where future housing and businesses can be located.

Demand for housing and business land: This section summarises projected population and employee growth for the next 30 years and translates this information into housing and business land demand across the three districts. It highlights where supply may fall short in the short, medium and long term, considering factors like immigration trends, ageing population, smaller households, housing types, affordability and Māori housing needs.

Scenarios and development options: This section outlines the methodology for identifying and creating scenarios and development options for the Eastern Bay. Broadly, this section presents the scenario analysis results from a long list of options all the way through to the growth scenario used for the spatial plan. This section is broken down into the following steps:

1. **Step 1: Long list scenario –** Developed to test spatial configurations of land use changes in a technical process based on locational and performance principles.
2. **Step 2: Medium list development options –** The list of development options because of the consistently identified 'good ideas' in the long list scenarios. These provide a set of options for where development could go, which are more likely to be feasible.
3. **Step 3: Short list development options –** Based on the outcome of the medium list of development options assessment, the best ranking options were brought forward into the short list options.
4. **Step 4: Scenario assessment for the future development pattern –** This step involved testing the short list development options based on three 30-year strategic scenarios, with one emerging preferred scenario.
5. **Step 5: Changes made due to engagement feedback –** This section includes a summary of the engagement period as it relates to the strategic scenario including key findings and new areas to investigate.

Development options for the Spatial Plan – Based on the technical evidence in this report, feedback from the community and the completion of further technical work, the final development options included in this report informs the housing and business land requirements for the spatial plan.

1.3 Input to the Spatial Plan

The Scenarios and Development Options Report is a technical input into Our Places

The Spatial Plan guides future development, coordinates and align economic and social aspirations and balances the effects between development and the environment. It leads to a set of actions that work towards what we want to do together and leverages collaborative methods to tackle transformational opportunities. To achieve this, the Spatial Plan requires a sound evidence base to ensure that decisions consider the best available information.

Scenario analysis in the spatial planning process helps to develop an understanding of how different growth outcomes affect the goals and objectives identified by partners, the community and stakeholders, the possible impact of wider environmental, cultural, economic, and social trends on an area, and potential policy levers and investments required to achieve desirable growth outcomes.

The Scenarios and Development Options Report is a key input to the Spatial Plan, focusing on land development needs, while recognising that the development of the Spatial Plan and implementation programme, will need a broader perspective than what is within the scope of this report. The first step is to select a preferred scenario for the settlement pattern. The next step is to develop the Spatial Plan and the final implementation plan.

Figure 2: Relationship between this report and the Spatial Plan

1.4 Inputs into the Scenarios and Development Options Report

The inputs into this report relate to requirements that must be met through relevant legislation, plans and strategies from national, regional and local sources as well as existing priorities such as economic opportunities, the existing urban form of locations, socioeconomics and demographics factors, and culturally significant places. This report also considers the goals the Spatial Plan aims to achieve.

The table below describes the inputs considered during the preparation of this report. These are augmented by the advice and knowledge of the cross-council Technical Working Group, Project Control Group, and the Project Governance Group.

Table 1: Inputs in the Scenarios and Development Options Report

Goals to achieve	Requirements to meet	Important plans and strategies	Information about the Eastern Bay
Goals set the direction of the Spatial Plan, and the benefits sought through its implementation.	Rules or policy directives that the Spatial Plan must deliver on.	Important plans and strategies from national, regional, and local sources considered when preparing the plan.	Opportunities and priorities of places in the Eastern Bay provide information for decision making.
• Tangata Whenua aspirations, plans, and priorities • Community priorities • Stakeholder priorities and interests	• Settlement provisions • Statutory Acknowledgements • Legislation (i.e. RMA, LGA, LTA) • National Policy Statements • Regional Policy Statement and Plan • District Plans • Environmental performance	• Iwi authority environmental management plans • National Adaptation Plan • Emissions Reduction Plan • Arataki - NZTA's 30-year plan • GPSs Land Transport; Housing and Urban Development • Education Network Plans • Plans about places • Others	• Culturally significant places • Socioeconomics / demographics • Urban form and places • Three waters infrastructure • Transport networks • Community facilities and parks • Land capability for growth • Important environmental places • Climate change and natural Hazards • Projects and economic opportunities

1.5 Goals to achieve wellbeing outcomes

The Spatial Plan is a 30-year strategy to help communities grown in a sustainable way. It focuses on improving our amenities, protecting our environment, offering better transport options, and providing housing that meets the needs of our diverse and growing population. Goals are relevant across the entire Spatial Plan project, including within the scenario and development options process.

The Project Governance Group (PGG) developed goals to provide direction for the Spatial Plan in achieving long term wellbeing outcomes. These were developed to be in alignment with the Long-Term Plan vision and community outcomes across the sub-region, prior engagements and consultations, and considering Iwi values and aspirations. The figure below sets out these goals of which are also key inputs into this report.

Figure 3: Goals for the spatial plan

2 Influences and constraints for housing and business growth

The Eastern Bay context provides specific influences when considering changes to accommodate 30 years' worth of possible development. By identifying land that is complex to develop, prone to natural hazards, needs to be protected, we start to see where resilient growth may occur. Key considerations include:

- Several defining land ownership patterns affect how and where development can go, including Te Urewera and land owned by the Department of Conservation (DOC).
- Approximately a quarter of land in the Eastern Bay is owned my Māori, 22% is in Māori freehold land tenure.
- Existing natural hazard risk is a significant issue to consider because many communities in Whakatāne and Ōpōtiki districts are located adjacent to major river systems.
- Avoiding high risk areas including proximity to rivers for greenfield development is critical when considering options for strategic long-term planning.
- Future growth for greenfield areas and for existing settlements should be considered carefully as the carrying capacity of catchments and stormwater management networks is limited, particularly where they are located within or connected to a major floodplain.
- Pockets of highly productive land are present throughout the sub-region which are an important resource that needs to be safeguarded.
- The Hazardous Activities and Industries List (HAIL) is a compilation of activities and industries that are considered likely to cause land contamination. There are HAIL sites throughout the Eastern Bay which will need review at a site-specific level, to determine if they are compatible with residential development or other uses and if mitigation is required.
- The Eastern Bay includes sites and areas that are culturally and environmentally significant and protected from inappropriate development.

The areas to protect and of constraint map (Figure 7) provides a high-level understanding of the spatial constraint areas that create challenges to resilient urban growth. There will be areas which have critical constraints where urban development needs to be avoided and where the risk to people and property is high. There are also areas with natural hazard susceptibility or other land constraints. Growth should be directed away from these areas unless it can be demonstrated that the issues can be managed with risk mitigated to acceptable levels.

The identification of these areas has been informed by policy direction at a sub-regional level, hazard assessments, technical studies, plans and reports. The features on the maps within this section have been shown for spatial planning purposes only. Site-specific constraints and features to protect are often managed through district planning rules.

2.1 Complex land interests

There is 758,899 ha of land in the Eastern Bay. Several defining land ownership patterns affect how and where development can go. The largest of these include Te Urewera, covering 127,845 ha, DOC land covers 200,891 ha and plantation forestry land covers 152,713 ha.[2]

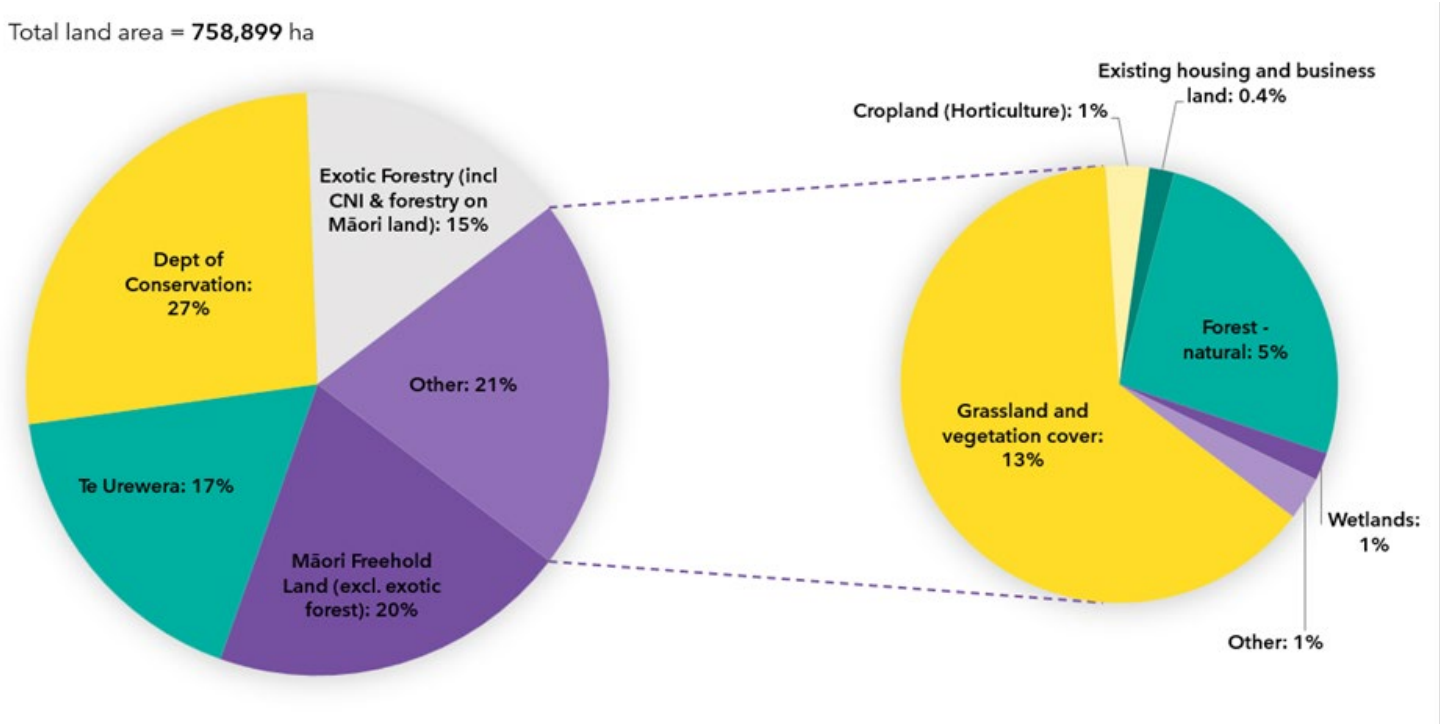

Figure 4: Complex land interests in the Eastern Bay

[2] The Eastern Bay of Plenty sub-region includes Whakatāne district, Kawerau district and Ōpōtiki district. The geographic boundaries are as of 1 January 2023. Data sources: Land Information New Zealand, Department of Conservation and Te Puni Kōkiri.

Conservation land is vast across the Eastern Bay, including small urban parcels and large forested areas

The Department of Conservation administers 26% of land in the Eastern Bay area as a conservation area pursuant to the Conservation Act 1987. Conservation areas include land or foreshore held under the Conservation Act for conservation purposes, which has not been given additional protection. All conservation areas have been set aside for conservation purposes and are protected for their natural and intrinsic resources. Conservation land is non-ratable under the Local Government Rating Act 2002, and not a source of revenue to Local Government. Most of the land within the Ōpōtiki district is covered with indigenous vegetation and provide multiple recreation reserves, which draws people all over the country.

Exotic forestry accounts for large sections of land across the Eastern Bay, with the largest areas in southern Whakatāne and Murupara

Forestry accounts for 20% of land use by area in the Eastern Bay. Of this 20%, approximately one third is part of the Central North Island Iwi Collective land. Whakatāne district alone contains approximately 20.5% of all Central North Island's exotic forests, and most North Island forestry is within a 100 km radius of both Whakatāne and Kawerau. Kawerau is a key hub for timber processing and transportation, making the Eastern Bay a substantial contributor to the forestry sector.

Māori interests in Eastern Bay includes housing, economic development and protection of the cultural landscape

Today, 22% of land in the Eastern Bay is Māori freehold land, being 168,987 ha in total.[1] The majority of this is rural. The dispossession of land through confiscation and associated land use change has led to the loss of Māori owned land and in a lot of cases where land has been given to iwi, this has been in a different location to their traditional rohe. Most iwi in the Eastern Bay have settled their Treaty claims and have their Treaty settlements enacted through legislation. The development of Māori freehold land is not straightforward. Māori freehold land is characterised by ownership that is generally diverse and dispersed – with succession and title fractionation, large numbers of owners may hold a small interest in individual titles or amalgamated entities (ahu whenua trusts and incorporations). Some Māori land is unable to be used as collateral to leverage financial support for Māori owners. This can restrict Māori landowners from building the foundations to grow their land to the benefit of themselves, their whānau, and the Māori economy.

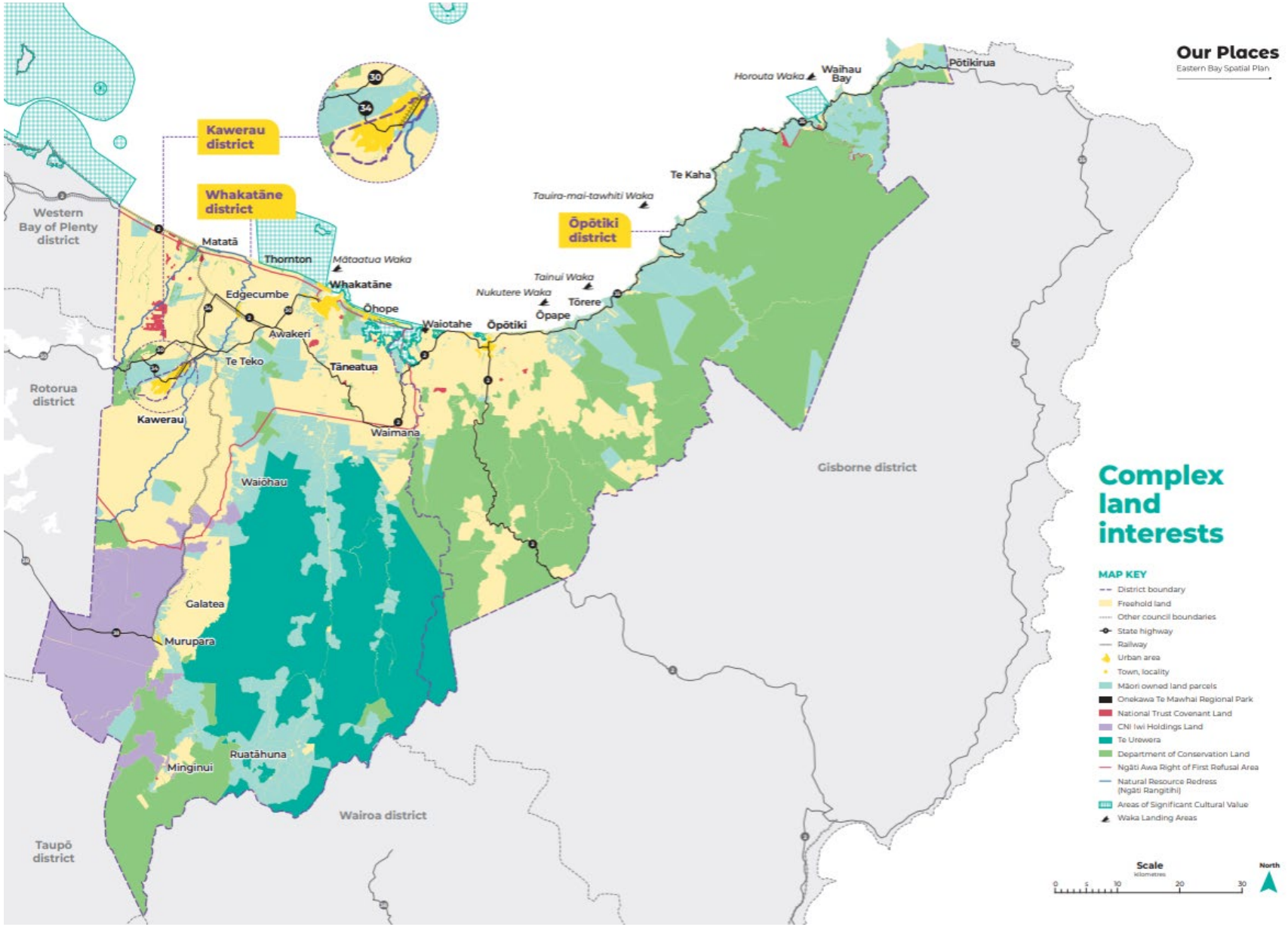

Figure 5: Complex land interests map

2.2 Māori land interests

Tāngata whenua as landowners have diverse interests across the sub-region, recognising that Māori housing and business development is intertwined with the growth of the Eastern Bay. One of the goals of the Spatial Plan is to work with Māori landowners to enable development of their land in alignment with their aspirations. Iwi and hapū are well-positioned to provide models of economic growth that prioritise holistic wellbeing outcomes, having significant land ownership interests on both Māori freehold and general title land, including large holdings such as Central North Island Iwi forestry land, extensive parcels in Kawerau owned by Ngāti Tūwharetoa Holdings Ltd, Ngāti Awa licensed land, and Putauaki Trust industrial land. In the Eastern Bay, Māori owned land supports diverse productive uses, including horticulture, exotic forestry, dairy, and cropping activities.

Papakāinga, multi-generational housing and marae communities are innovative solutions to community and housing needs. Papakāinga is more than just housing as it can provide communal shared spaces shared gardens and sometimes employment and education opportunities. What is included in papakāinga is reflected by the support system and needs of whānau. The development of pāpakainga can offer quality housing solutions for multi-generational needs, while offering whānau the opportunity to move home to their whenua. It is recognised that there are barriers to papakāinga development, including planning restrictions and lack of infrastructure, as well as the consent and permission that is often required by various landowners. Further conversations with Iwi, hapū and whānau are needed and continue to be a priority within the spatial plan and form part of work programme moving forward.

2.3 Natural environment

Providing a clear understanding of the features of the land and geographical constraints in the Eastern Bay gives insight as to where we may adapt and grow, while also showing where we are protecting our significant natural and cultural places. Eastern Bay has many natural environmental areas and landscapes that have important environmental attributes and services. Within the sub-region, there are maunga (mountains), ngāhere (forests), geothermal fields and springs, floodplains, wetlands, awa (rivers and streams), coastal dune systems, beaches, estuaries, and harbours. Protecting and preserving these areas will support access to nature, improvements to water quality and allow native flora and fauna to thrive.

The sub-region includes areas of high country with terrain that steadily inclines in a landward direction and then descends again toward Murupara and Rotorua. The steep and forested terrain are often either protected areas or are used for commercial forestry. Steep terrain topography also corresponds with the distribution of annual rainfall. Rainfall is generally greater in the high-country areas of the Raukūmara Ranges than the coastal areas and decreasing again toward Murupara. These catchment areas influence the biodiversity and ecology of waterbodies, and activities on the land in a catchment can impact on water quality and quantity. The rivers in the Eastern Bay are aligned north-south in the eastern ranges that exist along major fault lines. The main rivers in the Eastern Bay are Rangitāiki, Whirinaki, Whakatāne, Waimana-Tauranga,

Tarawera, Waiōtahe, Waioeka, Otara, Mōtū and Raukōkore. All rivers flow through deeply cut hill country, before flowing north to reach the low land around Whakatāne, Kawerau and Ōpōtiki or directly to the sea. The main rivers in the Eastern Bay are Rangitāiki, Whirinaki, Whakatāne, Waimana-Tauranga, Tarawera, Waiōtahe, Waioeka, Ōtara, Mōtū and Raukōkore. Uses of the rivers and streams include municipal and industrial water supply, waste disposal, irrigation, frost protection and hydro-generation. Rivers, streams, groundwater, and wetlands are impacted by a growing population and land use changes.

The groundwater table is influenced by topography and rainfall and fluctuates over time. In coastal and estuarine environments, water levels change in response to tidal cycles, whereas further inland, groundwater fluctuates in response to rainfall. It is important to consider groundwater in both coastal areas and adjoining major river systems where groundwater interacts with rising sea and or river levels, which will be exacerbated by a changing climate. Generally, low lying areas in the Eastern Bay have higher water tables. These areas include the Rangitaiki Plains, Waiohau, Galatea, Murupara, Tāneatua, Waimana and Ōpōtiki[3].

The Eastern Bay includes the largest extent of coastline in the region and features several rural coastal settlements. The coastal environment provides amenity, ecological, cultural, spiritual, recreation and economic values for communities. Care is needed when considering the coastal environment for urban development.

2.4 Areas to protect

Existing environmental protections

The ecological and environmental values of many areas and sites across the sub-region have already been lost or degraded due to previous residential, industrial, and agricultural development. Remaining areas and sites of significance often have multiple values and need to be protected from development. These include outstanding natural features and landscapes, significant natural areas, significant indigenous biodiversity areas, wetlands, parks, reserves, and conservation covenants. Many of these areas have land use and zoning controls which restrict certain activities occurring within a defined area.

Historic Heritage Sites and Sites and Areas of Significance to Māori

The protection of historic heritage from inappropriate subdivision, use, and development, is a matter of national importance. Coastal historic heritage inventory, buildings, objects, and sites of significance are of value to the community. Urban form decisions will influence the extent to which historic values can be maintained and enhanced. For example, urban renewal at high densities will require replacement of older housing stock which may possess historic values. Large scale redevelopment will also require excavation of sites that may affect archaeological values. Protected sites and areas include

[3] GNS Science: National Water Table Model Interactive Map, 2018: GNS National Water Table interactive map - GNS Science | Te Pū Ao

sites that have formal protection under the Heritage NZ Act. While this is an important consideration, it is not practicable to map sites and areas of heritage significance for high level spatial planning. This issue should be addressed through more detailed place-specific spatial planning.

Sites and areas of significance to Māori are places and features that hold historical, cultural and/or spiritual significance that have deep levels of meaning and association for mana whenua. They may include urupā, pā, maunga tapu, kainga, turanga waka and places where taonga have been found. These sites may be wāhi tapu (sacred sites) or wāhi tupuna (ancestral sites). The relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu and other taonga is a matter of national importance. It is noted that the sites and areas of significance to Māori have not been shown on the areas to protect and of constraint map recognising that this is a matter for further engagement with mana whenua.

2.5 Areas with natural hazards and other land constraints

The Eastern Bay is susceptible to a range of natural hazards which will influence the future urban form of the sub-region and its infrastructure resilience, for both existing and future infrastructure requirements. The effects of climate change are becoming more apparent with sea level rise, increased flooding and other weather-related events that will present significant challenges to adapt to.

There are areas where change or development can occur, but only with great care and where effects can be mitigated to an acceptable level. This may include low density developments such as rural-residential and papakāinga. In practical terms, almost all land will be subject to some constraining features, although the degree of constraint will vary.

Coastal environment

The coastal environment as it relates to natural hazards is well understood within the Eastern Bay. A wide range of natural hazards overlap along the coast and result in a high level of risk, particularly areas that are low-lying or below sea-level. Hazards include tsunami risk, coastal flooding and inundation, and erosion. Natural processes are heightened by climate change and can become more significant hazards over time, such as sea-level rise, high groundwater, soil salinity, as well as greater effects of erosion and inundation.

Flooding

Considering the environment elements in the Eastern Bay include a vast coastal area, ten rivers, both steep and low-lying topography and a changing climate, planning for growth must proactively address flood hazards. Flooding is a known natural hazard risk and is a significant existing and future constraint in the sub-region. Many floodable areas are mapped and there is still more work to do to understand the extent of flooding risk in some areas. This will inform where and how growth could occur in existing and future areas. As detailed in the district plans, development where there is flood risk needs to be

avoided or mitigated. The main types of flooding[4] are groundwater flooding, ponding, overland flowpaths, river and stream flooding onto floodplains, and coastal flooding including both harbour and estuary flooding. Water will naturally follow overland flowpaths and floodplains in an intense rainfall event. These natural flows are an important part of the flood management system, allowing water to flow and recede during and after intense rainfall events.

There are five main river and drainage schemes in the Bay of Plenty, four of which exist within the Eastern Bay. These are the Whakatāne, Ōpōtiki, Rangitāiki and Tarawera river and drainage schemes as shown on Figure 6, river and drainage schemes map. River and drainage schemes contain a mix of flood protection and drainage assets such as floodways, stopbanks, drains and erosion controls, providing essential services to keep communities safe from the effects of flooding. Without these assets, urban areas would be inundated by floodwaters during extreme events. For example, Te Teko and Edgecumbe urban areas are within the Rangitāiki Floodplain and major urban stopbanks run adjacent to the Rangitāiki River as a flood protection measure for these settlements. It is important to recognise that these assets provide for a specific level of service and are still prone to a risk of floodwater breaching the defence in a rainfall event that is greater than the defence is designed for (residual risk). Te Teko and Edgecumbe are also located downstream from the Matahina hydro-electric dam. In previous heavy rain events, floodwater has been pre-emptively released from the spill gates of the dam to relieve the water pressure and lessen the impact of flooding upstream and downstream.

[4] Toka Tū Ake: Natural Hazards Portal – storms and floods: https://www.naturalhazardsportal.govt.nz/s/natural-hazard-risk/about-natural-hazard-risk/storms-and-floods

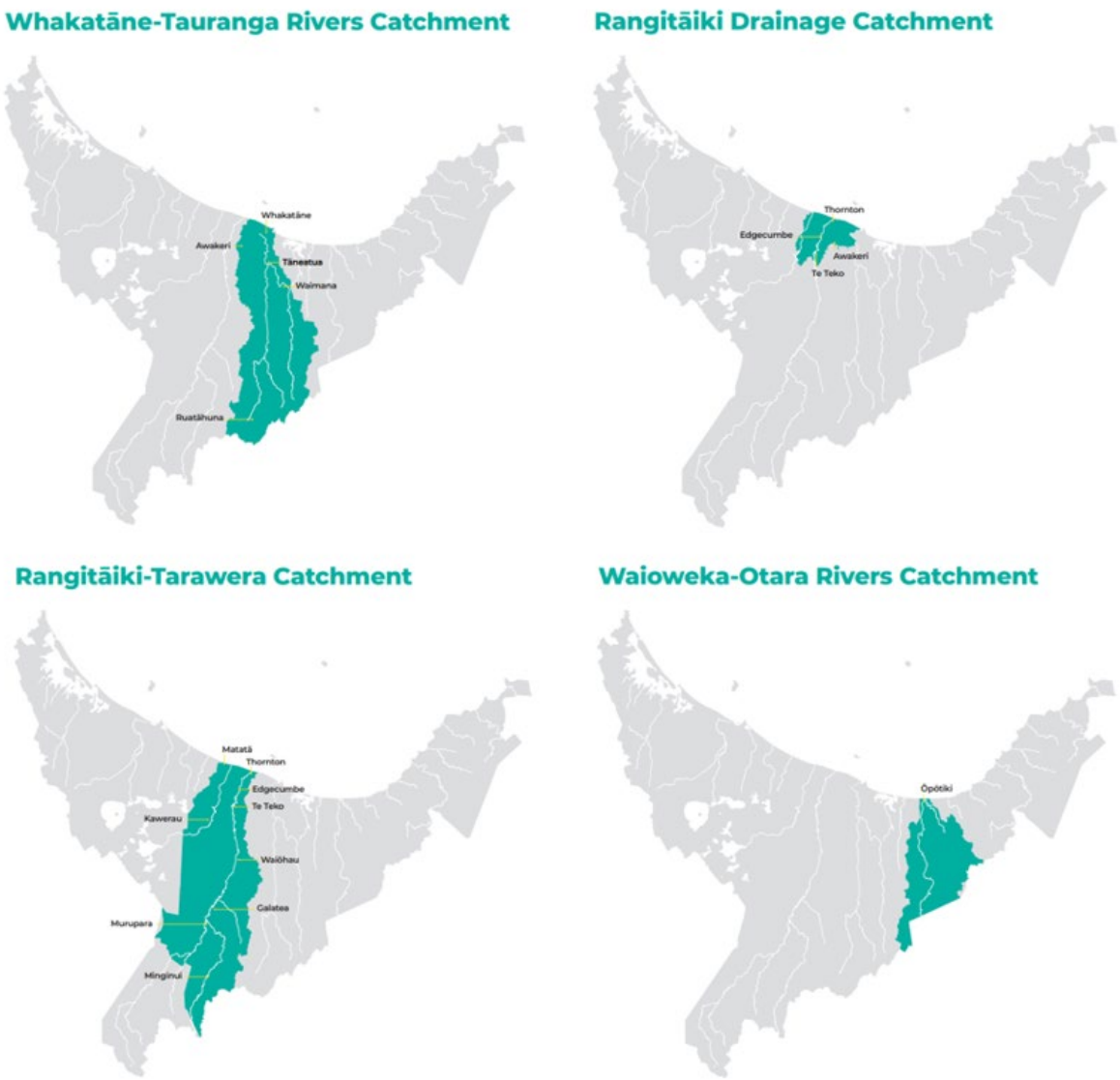

Figure 6: River and drainage schemes

Increased flood risk from a changing climate

Climate change is expected to cause sea level rise, as well as bringing much heavier rainfall than what is currently experienced. The carrying capacity of the rivers and streams in addition to the functions of flood mitigation assets will come under pressure over time, due to the changing climate and increased weather events. This increases the likely residual risk of flood hazards, being the risk of flooding that remains where a flood management asset is breached due to a rainfall event that's severity is greater than the level of service that asset provides.

Decisions on flood risk management for existing, intensified or new urban areas must take a long-term management perspective, taking a precautionary approach to the risk and uncertainty of future weather events. Decisions must also consider the carrying capacity of the catchment, consequences of flooding, affordability and resilience and vulnerability of communities and infrastructure, as well as the risk to life and property. The cost of flood protection is becoming increasingly expensive for communities and councils. This may prompt councils to consider alternative approaches to flood risk management in the future, including initiating adaptation processes or initiatives to guide future information gathering and decision-making to manage existing risk to vulnerable communities.

Highly Productive Land

Primary production is a key industry in the Eastern Bay. Parts of the sub-region are classified as containing highly productive soils, which are some of New Zealand's most fertile for food production. The National Policy Statement for Highly Productive Land 2022 (NPS-HPL) has provisions to improve the way that highly productive land (Land Use Capability (LUC) Class 1, 2, or 3) is protected from inappropriate use, development, or subdivision.

Implementation of the NPS-HPL is subject to a regional planning process. The mapping of highly productive land has not yet been notified by BOPRC (as of August 2024). To recognise this important resource and the relevant directions of the NPS-HPL, to manage effects on LUC Class 1, 2 or 3 soils, highly productive land is generally avoided for urban development purposes, unless exceptions apply including those for papakāinga. At the time of this report, the Government has signalled removal of Class 3 soils from the National Policy Statement. Changes from this would become part of future updates to the spatial plan.

Other constraints

A range of other natural hazards need to be considered in the Spatial Plan. Not all constraints are shown in Figure 7. Tsunami risk can be managed through evacuation planning and warning systems. Risks from faulting and earthquakes (which include liquefaction) can be managed and mitigated through engineering and construction solutions. Geothermal surface features need to be avoided when planning urban development due to the risks to safety.

There are areas which contain peat soils which form from the build-up of partially rotted plant material in wet environments. As peat shrinks, the depth of fertile topsoil also decreases. Steep land features limit urban development because they are unserviceable and are prone to geotechnical issues.

The Hazardous Activities and Industries List (HAIL) identifies potentially contaminated sites[5]. The list indicates that such activities and industries are more likely to use or store hazardous substances and therefore there is a greater probability of site contamination occurring than other uses or activities.

[5] HAIL request | Bay of Plenty Regional Council (boprc.govt.nz)

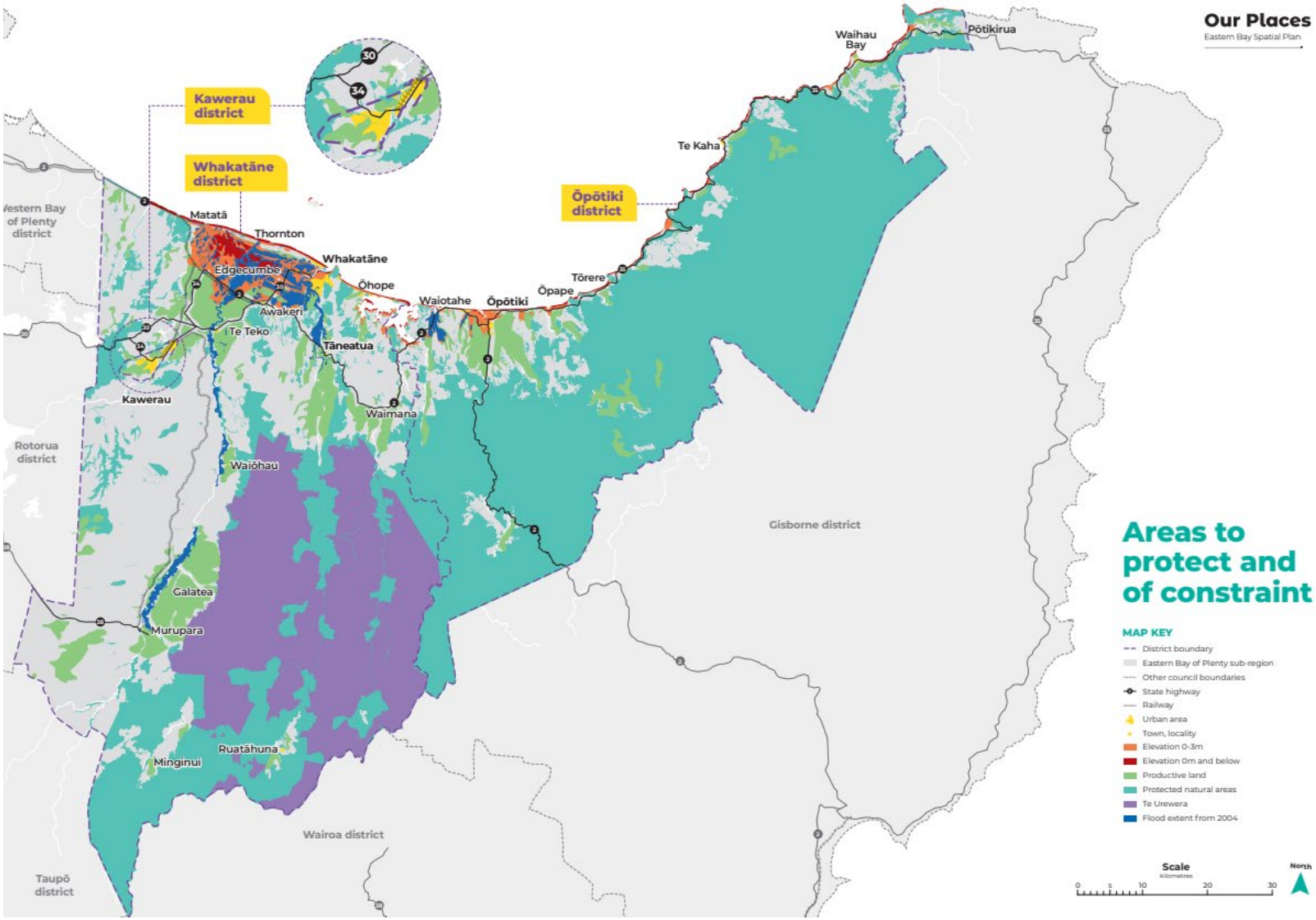

Figure 7: Areas to protect and of constraint

3 Deciding how much to grow and plan for

The NPS-UD, Policy 2 requires Tier 3 local authorities, always, provide at least sufficient development capacity to meet expected demand for housing and for business land over the short term, medium term, and long term.

Providing sufficient housing and business land supply means that the goals set for the Spatial Plan are easier to meet and the benefits to the people of the Eastern Bay are more likely to be realised. The consequences of not being prepared for growth include lack of developable land to meet demand, and this can restrict supply and make housing and infrastructure less affordable. The financial risks of over committing investments are also real and need to be managed.

Population and employment projections have been prepared to provide an understanding of the scale of future growth that will need to be accommodated in the long-term. The medium (most likely) population projection estimates[6] the sub-region's population will increase from 56,500 in 2022 to 68,000 in 2055. This growth in population directly drives demand for housing and business land.

[6] This is the medium population projection as identified within Appendix 1 – Eastern Bay of Plenty Housing and Business Needs Research MRCagney (NZ) Ltd 2023. This projection aligns more closely to the Stats NZ high population projection.

Assumptions in growth management		Actual population growth	
		Low	High
Projected population growth	Low	 Investment aligns to demand and supplies a suitable amount of land to the market for housing and business purposes.	 Lack of housing makes housing unaffordable. Lack of planning for growth results in significantly higher infrastructure costs. Poor outcomes, and limited ability to mitigate consequences.
	High	 Over investment in infrastructure may occur. This can be mitigated by identifying trigger points for investment. Investment spread over a lower rating base reduces affordability (i.e., higher rates required)	 Investment aligns to demand and supplies a suitable amount of land to the market for housing and business purposes. Public facilities and amenities improvements keep pace with demands.

Figure 8: Comparing consequences of different growth assumptions

3.1 Development capacity and wider influences on demand

Active monitoring of population changes in the Eastern Bay is necessary to adapt to changes in the pace of growth.

The Eastern Bay connects to the Western Bay of Plenty and Rotorua districts, as well as with Gisborne district and Tairawhiti district on the East Coast. The development of the Rangiuru Business Park, the possible eastern town at Paengaroa and Rotorua growth nodes, further development of the Ports of Tauranga and Gisborne are all potential influences on the Spatial Plan, as are other nationally or globally driven political and economic factors.

Providing for a sustained pipeline of serviced and zoned land supply is important to ensure housing is available at affordable levels, that new commercial investments are supported because workers moving to the Eastern Bay have good quality homes to live in and there is land that can enable expansion of business activities, and to enable Iwi to welcome people back to their lands.

The population of the Eastern Bay had been stagnant or falling from at least the late 1990s through to the early 2010s and projections for future growth were quite reserved. Even as the population started to grow in 2014, it was unknown whether this was temporary or permanent. The populations continued to grow each year. Resultantly, some areas of the Eastern Bay face shortfalls of planned housing land due to unexpected growth rates.

Economic development across the Eastern Bay is dependent on sufficient housing for workers. Earlier analysis[7] identified that a lack of new housing to meet increased demand has the potential to stall overall economic growth across the Eastern Bay and would impact on the successful delivery of the projects and economic growth across the sub-region. Business developers need certainty around where housing supply will be provided, so they can secure accommodation for their employees and ensure that investors have confidence in local housing availability.

3.2 Existing population

2018 census data predict for 2023 that the Eastern Bay is called home to about 57,000 people. Of this, 33,500 people live in the townships of Kawerau, Ōpōtiki and Whakatāne and approximately 11,650 live in the villages of Awakeri, Matatā, Murupara, Tāneatua, Te Teko and Edgecumbe and approximately 11,850 people live more rurally across the sub-region.

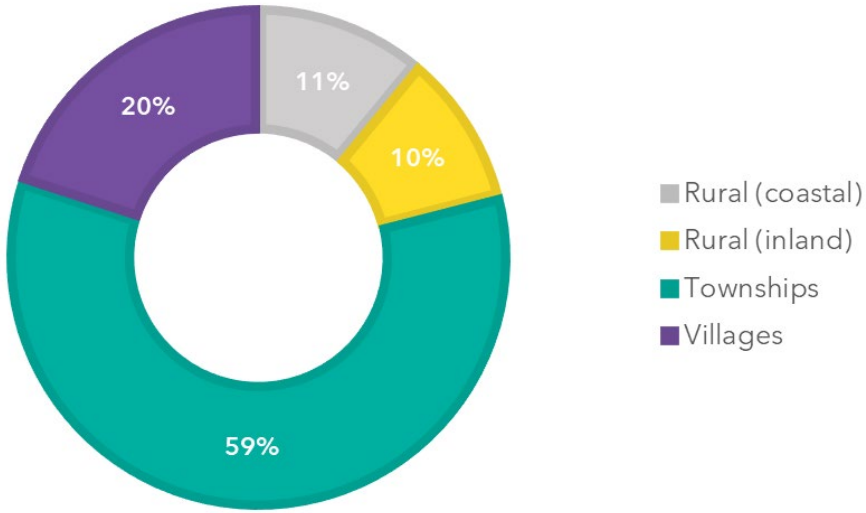

Figure 9: Distribution of population

[7] Eastern Bay of Plenty: Regional Development Report (2019).

3.3 Population projections

Projections are an indication of the overall trend and not an exact forecast[8]. To manage uncertainty, a range of potential projections should be applied to ensure that contingencies are considered. Regular monitoring and reporting of population changes throughout Long Term Plans and infrastructure plans will enable adaptable implementation of funding and infrastructure programmes. To inform the projections for land demand, new population projections were produced for the Spatial Plan.[9] Between 2013 and 2023, our total population grew by more than 9,000 people. The growth rate in the three districts from 2013-2023 was: Whakatāne 17%, Kawerau 22%, Ōpōtiki 24%.

Looking ahead at the next thirty years, population growth is expected to continue. Low, medium, and high growth projections have been developed to inform the Spatial Plan with a range of possible population futures. The **medium growth** projection is likely the most realistic as it is well aligned to current growth trends[10].

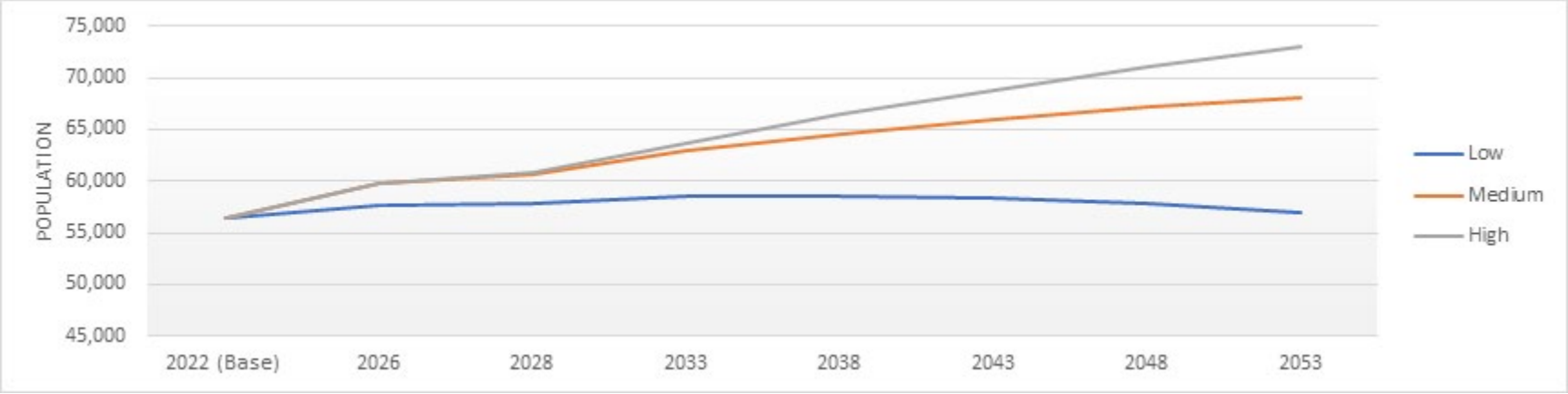

Figure 10: Eastern Bay Population Projections (MRCagney, 2023)

[8] Note, this report works with estimates that are subject to change.
[9] Unless otherwise referenced, data presented in this report section are drawn from the Eastern Bay of Plenty Housing and Business Needs Research, MRCagney (NZ) Ltd, 2023 Appendix 1.
[10] This projection is based on the Stats NZ High population projections for each District.

Table 2: Population projections by district over time

Population Projections	Short Term		Medium Term		Long Term			
	2022 (Base)	2026	2028	2033	2038	2043	2048	2053
Low								
Whakatāne	38,300	38,900	39,100	39,400	39,500	39,400	39,100	38,600
Ōpōtiki	10,400	10,800	10,900	11,100	11,100	11,100	11,100	11,000
Kawerau	7,800	8,000	8,000	8,000	7,900	7,800	7,600	7,400
Total low	56,500	57,600	57,900	58,500	58,600	58,300	57,800	57,000
Medium								
Whakatāne	38,300	40,400	41,000	42,400	43,500	44,500	45,300	46,000
Ōpōtiki	10,400	11,200	11,400	11,900	12,300	12,600	12,800	13,000
Kawerau	7,800	8,300	8,400	8,600	8,800	8,900	9,000	9,000
Total medium	56,500	59,800	60,700	62,900	64,500	66,000	67,100	68,000
High								
Whakatāne	38,300	40,400	41,100	42,900	44,500	46,000	47,400	48,700
Ōpōtiki	10,400	11,200	11,400	12,000	12,700	13,300	13,800	14,300
Kawerau	7,800	8,300	8,400	8,800	9,200	9,500	9,800	10,000
Total high	56,500	59,800	60,800	63,700	66,400	68,800	71,000	73,000

3.4 Immigration and natural increase contributing to growth rates

The net migration from 2013-2018 was a large driver of population growth in each of the districts making up around 70% of total growth.

All three districts have had a positive but declining natural increase in population since 1996 (i.e. births within each district have been higher than deaths). Natural increase in population across these districts from 2013-2018 was about 3% of the 2013 population. All three districts had negative net migration from 2001-2013 (more people leaving the district than moving to it) followed by positive net migration from 2013-2018 (more people moving to the district than leaving it).

New Zealand's national immigration settings are an important driver of growth in the Eastern Bay. New Zealand had a record net migration gain of 110,200 in the August 2023 year.[11] New Zealand's population ($5.13M in 2022) has a 90 % probability of being between 5.55M and $6.65M in 2048 and between $5.62M and $7.86M in 2073. Migration will continue to be a primary driver of population growth for New Zealand, impacting growth in the Eastern Bay.

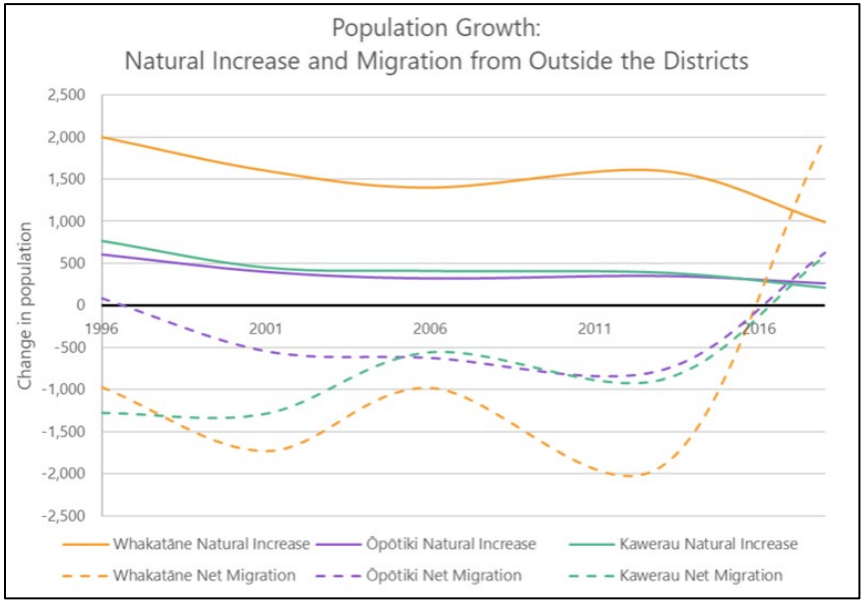

Figure 11: Natural increase and net migration by District (MRCagney, 2023)

[11] StatsNZ:https://www.stats.govt.nz/news/net-migration-exceeds-100000/

4 Summary of demand for housing and business land

In all time periods, projected demand for residential land exceeds planned supply across the sub-region. New greenfield development areas are required to supply around 3,300 households in the Whakatāne-Kawerau area by 2053, and unlocking the Hukutaia growth area in Ōpōtiki, with rezoning and infrastructure should be done as soon as possible to meet demand in that area, as well as providing an option for managed retreat from natural hazard risk prone areas.

Infill, papakāinga, and rural residential developments will contribute to the supply. The quantum and timing are unknown, and these sources should be monitored for volume delivered over time and the findings of this report should be updated. Infill in existing townships is constrained by natural hazards. Large scale papakāinga and Māori-led housing should be supported once these opportunities become clearer, particularly when there is possibility of deferring the timing of other large-scale greenfield residential development areas.

There is a lack of commercial business zoned land across the three districts. There is a likely shortfall of commercial land in Whakatāne township, of around 10 ha-18 ha, with the lower range assuming realisation of redevelopment of existing sites. Ōpōtiki and Kawerau districts are unlikely to need new commercial land supply, as demand is expected to be met within existing commercial zoned areas or through newly established growth areas like Hukutaia.

Industrial development across the sub-region is expected to focus at the Putauaki Industrial Zone in Kawerau, with smaller site-specific developments in other locations, related to local opportunities like aquaculture. A cluster of industrial development is likely needed around Ōpōtiki township, in relation to growth of primary industries in that area.

Infill, Māori-led housing/papakāinga, and rural residential developments will add to the supply. In every period, there is intent for infill, papakāinga, and rural residential housing to meet parts of the overall housing demand. While recognising that, based on past performance, infill cannot be relied upon to produce a large supply of housing in any area of the sub-region. Infill locations are also subject to natural hazards (less so in Kawerau) which reduces their overall future potential and future district plans may curtail the scope of infill within Whakatāne and Ōpōtiki townships to reflect improved data on natural hazards.

Papakāinga is expected to be a meaningful contributor to overall housing supply. The quantum and timing are typically unknown to Councils, and as more detail is confirmed, the findings of this report may need to be reconsidered, or adaptations made to the Spatial Plan. Papakāinga developments will need to be considered for how they could possibly defer the timing of other development areas identified in the spatial plan.

Rural residential development needs to be directed to defined appropriate locations that balance resilient access, natural hazard exposure, reverse sensitivity impacts, and retention of highly productive lands.

5 Land required for housing supply

Evidence shows that more houses are required over the short, medium and long term. Housing types need to shift to suit an ageing demographic and housing affordability also needs to improve. Table 3 below shows the projected demand for housing over a 30-year period[12]. Table 6: Indicative housing supply compared to demand (assumes Hukutaia proceeds) shows the projected shortfall in housing availability to meet this demand (e.g., demand less available housing capacity).

New households, total demand projected 2022-2053	Short Term		Medium Term		Long Term			
	2022 (Base)	2026	2028	2033	2038	2043	2048	2053
Medium								
Whakatāne	0	790	1030	1607	2131	2605	3086	3439
Ōpōtiki	0	300	380	611	843	1065	1268	1400
Kawerau	0	200	240	355	426	516	582	622
Cumulative Total	0	1290	1650	2573	3399	4186	4935	5461

Table 3: New housing total demand

[12] Note, these totals are more than those from the MRCagney report (Appendix 1) because they include new households formed from the reducing household size that are not attributable to growth.

5.1 More houses are needed

By 2053, a range of 1,150 to 8,200 households are likely to be required, with the most likely (medium) demand being 5,461 (rounded to 5,500 for ease of reporting).

Average household sizes (number of people per house) determine how many housing units are projected to be needed to provide for a given population. These apply not only to growth, but also to existing households. Average household sizes have slowly declined over time in the Eastern Bay and across New Zealand as the population grows older on average.

The current average household size across the sub-region is estimated at 2.7 people per household in Whakatāne and Kawerau, and around 2.9 in Ōpōtiki. Stats NZ has projected how this is expected to change in the future for each territorial authority. In 2042, household sizes are expected to decrease to between 2.5-2.6 across the sub-region.

If Ōpōtiki grows as projected, with 2,600 more people over the next 30 years, it will need an additional 1,400 houses. However, considering factors, such as the increasing trend in building and resource consents, we anticipate that up to 2,300 more houses may be required within the same period. This demand far exceeds the currently available residential land, necessitating a large-scale solution for providing safe and affordable housing.

5.2 Housing stock to suit an older demographic

The types of housing required in the Eastern Bay in the future will need to support a growing ageing population. Our population is ageing overall, with a youthful and growing Māori population proportion. Those aged 65+ years will make up 30% of the population by 2053. Figure 12 below shows that the Māori population currently make up just over half of the population and is expected to exceed 60% by 2053. Māori have a very different age profile compared to the general population. The average age of Māori is 26.3 years, with the largest cohort aged 14 years and younger. The largest cohort of non-Māori is aged 55-59 years. This means that the types of housing required in the Eastern Bay in the future will need to support a growing population and an ageing population. While the Māori population is expected to have an older population in the future, their young population is also expected to grow compared to currently.

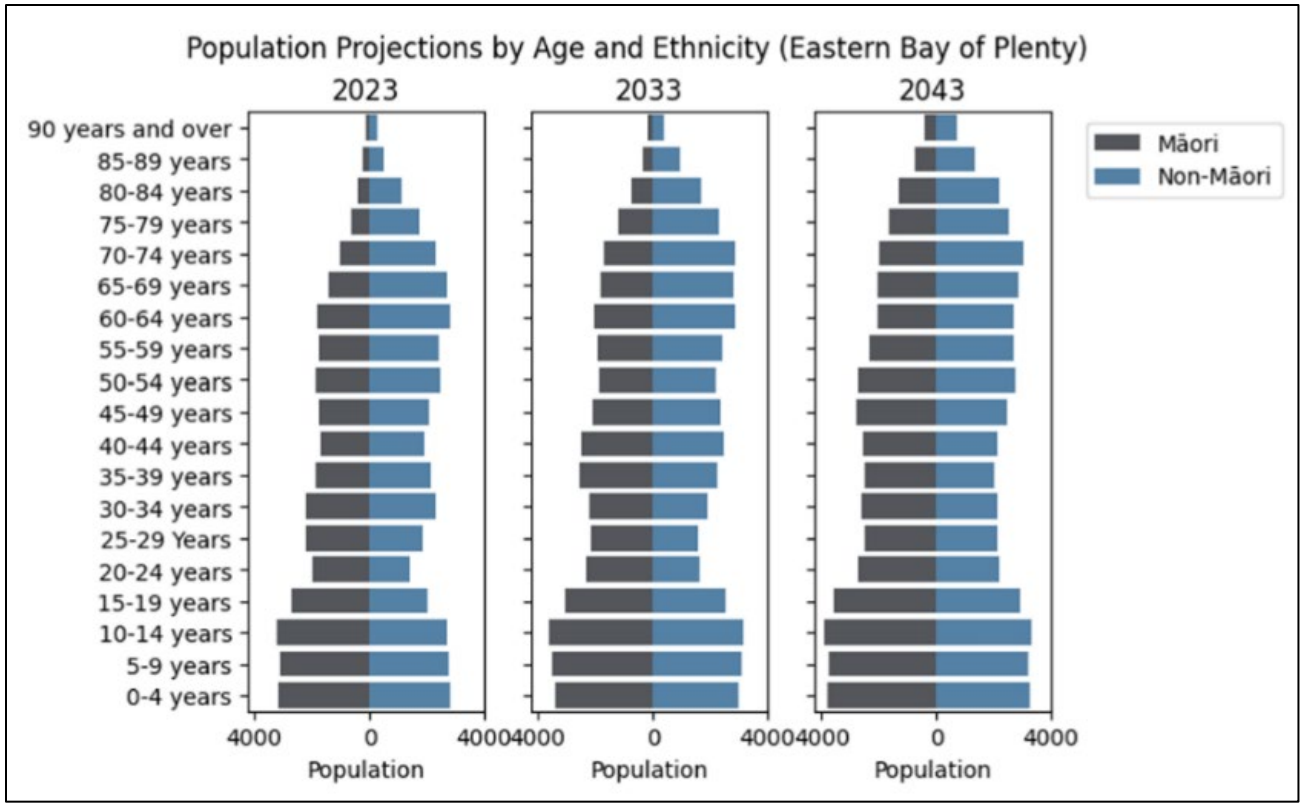

Figure 12: Population projections by age and ethnicity

5.3 Housing affordability needs to improve

Housing affordability has decreased in the Eastern Bay faster than the national average. We need to plan for more affordable housing, including providing supply to meet or exceed market demand for housing units and a wider range of typologies. Housing affordability has decreased significantly over the past decade. As shown in Figure 13 below, this is true for home buyers and renters across the whole country, but especially in the Eastern Bay where prices have gone up more than average. Comparing house prices to medium income, in all areas of the Eastern Bay, but especially Kawerau, mortgage serviceability is the least affordable it has been in the last ten years.

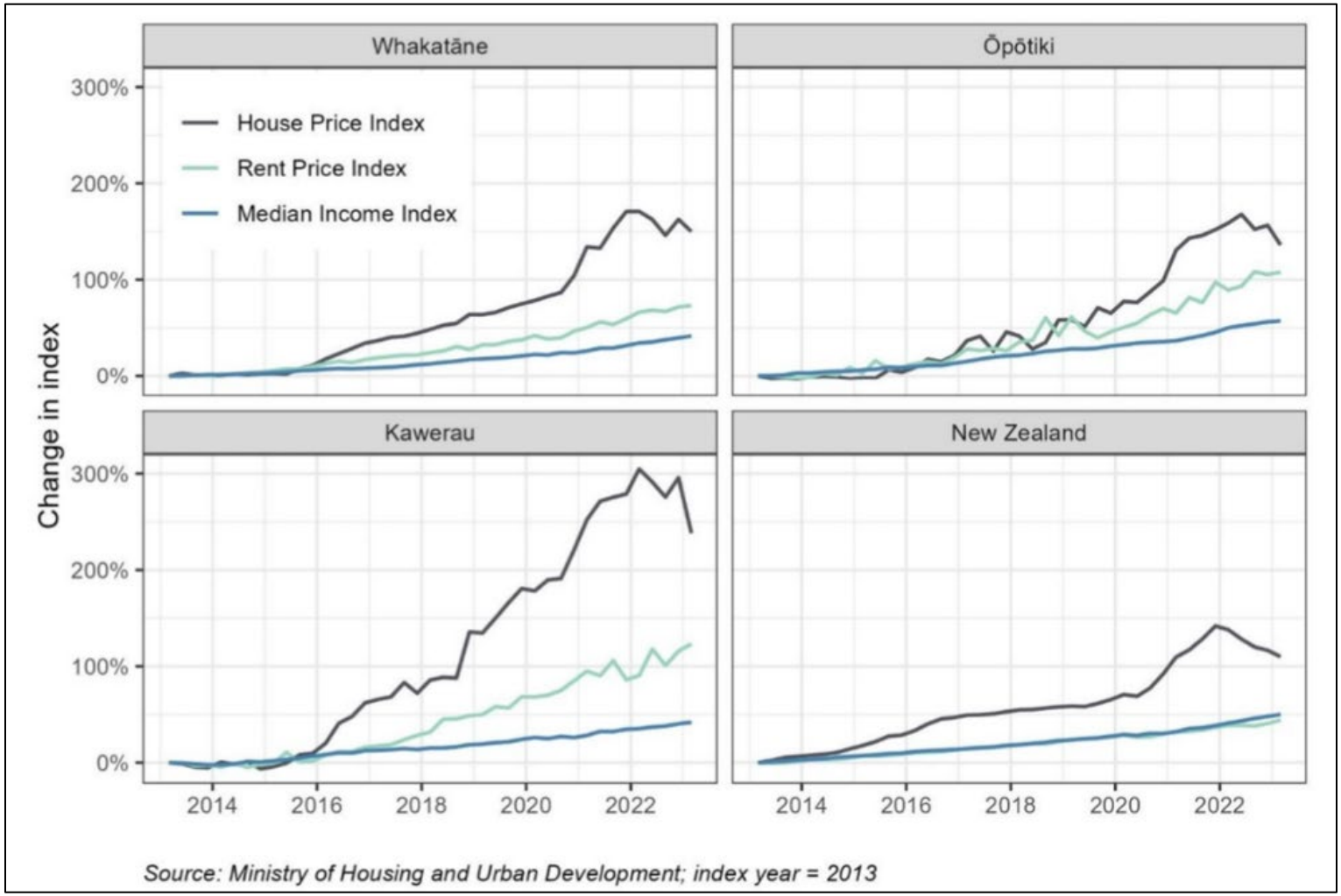

Figure 13: Housing affordability metrics in the Eastern Bay

5.4 Māori have different housing needs and experiences

The Māori population is younger than the non-Māori population and this is expected to continue to 2043. The Māori population is nearly 50% of the total population now and that is expected to remain true through to 2043. While the Māori population is expected to have an older population in the future, their young population is also expected to continue to grow. A recent survey[13] of Māori in the Eastern Bay found that on average, Māori have very different housing experiences than the general population. The survey found that:

- Eastern bay Māori homes are overcrowded and on average have two more people per household than the general New Zealand population.
- On average, 2.2 generations live within a Māori household
- Nearly half of all Māori in the Eastern Bay rent or board (43.2%)
- 30.3% of whānau own their own home compared to 64.5% of the general population.
- 25.2% of Māori live with whānau, at the whānau homestead or on whānau land.
- 0.7% of Māori are in emergency housing.
- Māori are 13 times more likely to experience racism when trying to rent or buy a home.

Other research[14] shows that Māori households spend about 20% of their expenditure on rent, compared to about 40% for the average household.

Due to the different age profile and cultural practices of Māori, the average household size for Māori families in the Eastern Bay means that many Māori households need larger houses or multiple houses near each other. Many rural and remote communities are predominantly Māori and based around whānau, hapū and marae. A recent survey of housing demands in the Whakatāne district, showed that 28% of the Māori population desired larger homes of 5 to 6 bedrooms.[15]

[13] *TIROHANGA ORANGA O MATAATUA*: Māori in the Eastern Bay of Plenty Covid-19 survey report by Melanie Cheung, 2020
[14] Greenaway R (2022). Homelessness in the Whakatāne District – A Situational Overview.
[15] *TIROHANGA ORANGA O MATAATUA*: Māori in the Eastern Bay of Plenty Covid-19 survey report by Melanie Cheung, 2020

In summary, tāngata whenua need affordable homes and rentals. They also want to be able to build papakāinga on their own whenua, particularly near their marae. Papakāinga would include homes, communal areas and in some cases, co-location of health and wellbeing, employment and/or education facilities. This is an issue that will require further detailed consideration through engagement with tāngata whenua. It is important to recognise the potential contribution that papakāinga can make to meeting future housing needs.

5.5 Projected housing typology trends

It is assumed that by 2053, around 1,000 units of the 5,500 medium household projected demand could be for attached building types. Where these can feasibly locate will need to be carefully considered in the context of natural hazards affecting Whakatāne and Ōpōtiki townships. Table 4 below shows the projected housing demand for attached type dwellings for each of the districts.

Table 4: Projected housing demand for attached dwelling types

Housing type	Whakatāne	Ōpōtiki	Kawerau
Stand-alone detached	Most housing will continue to be standalone houses. Over time, there will be more attached housing and apartments in all the districts, but mostly in Whakatāne, as described below.		
Attached	Most new attached housing will be in Whakatāne.	Very few in the short term, but in the medium and long term, some attached housing will be developed in Ōpōtiki and Kawerau.	
Apartment	Most apartments in the district will be within the Whakatāne township.	Very few apartments. Ōpōtiki and Kawerau should consider how to accommodate attached dwellings in the medium and long term. For example, for retirement and 'senior living' units which are likely to be in higher demand with the ageing population.	

5.6 Land required for housing purposes 2025-2055

The NPS-UD requires local authorities to provide development capacity that meets or exceeds demand and is reasonably expected to be realised. By 2053, the sub-region will need to supply around 400 ha of residential land to meet the medium projection. This could range from a low of 100 ha to a high of around 600 ha based on population growth and realised densities. Higher densities than 14 units per hectare would result in less land required. Table 5 below shows the projected gross hectares of land required for housing requirements based on the 14 units per hectare ratio.

Table 5: Projected land required for housing

Total land required at 14 units per hectare gross density	Short Term		Medium Term		Long Term			
	2022 (Base)	2026	2028	2033	2038	2043	2048	2053
Medium projection residential land required (hectares)								
Whakatāne	0	56	74	115	152	186	220	246
Ōpōtiki	0	21	27	44	60	76	91	100
Kawerau	0	14	17	25	30	37	42	44
Total	0	92	118	184	243	299	352	390

The assumption of 14 units per hectare depends entirely on the type of housing that is delivered and levels of intensification that can be achieved. The development of more intensive housing such as terraced housing, apartments or in-fill housing would significantly reduce the amount of land required.

If the Ōpōtiki district high plus demand figure of 2,300 households is the more accurate projected forecast, this could add another 65 ha of land requirements at 14 units per ha into the long-term timeframe for Ōpōtiki district. For the balance of this report, the base figure of 1,400 demand units in Ōpōtiki district will be considered.

5.7 Comparison to residential supply

Without changes to district plans and infrastructure to enable more zoned and serviced land, Kawerau can meet demand through the medium term, Ōpōtiki will run out of residential land before 2033, and Whakatāne has a current shortfall.

Based on a review of the current vacant land supply, land zoned for residential development is insufficient. There is a pressing need to enable Hukutaia infrastructure to unlock growth of that area for Ōpōtiki and to identify a large greenfield growth area for demand in Whakatāne and Kawerau, which is viewed as a combined demand given the proximity of the two places. Table 6 below demonstrates the indicative housing supply compared to the demand over the short, medium and long term.

Table 6: Indicative housing supply compared to demand (assumes Hukutaia proceeds in the long term)

Total household demand compared to estimated projected supply	Short Term	Medium Term	Long Term	Totals
	2022- 2026	2027-2033	2034-2053	
Whakatāne				
Supply available	455	175	0	630
Demand projected	790	817	1832	3439
Sufficiency (housing units)	-335	-642	-1832	-2809
Ōpōtiki				
Supply available	116	285	1943	2344
Demand projected	300	311	789	1400
Sufficiency (housing units)	-184	-26	1154	944
Kawerau				
Supply available	37	80	0	117
Demand projected	200	155	267	622
Sufficiency (housing units)	-163	-75	-267	-505

6 Land required for business purposes

An additional 85 ha or more of business land is projected to be required across the sub-region by 2053

This section outlines the demand for business land in the sub-region (MRCagney report, Appendix 1). The total number of employees in the Eastern Bay is projected to grow by 8% over the next 30 years, which equates to an average growth of 0.3% growth per year. This compares to the average growth in population of 0.6% per year. The reason the labour force growth is slower than population growth is because of the ageing population of the Eastern Bay, which makes the share of the working age population smaller over time.

Table 7: Business land growth assumption

*Assumptions for growth

Industry	Share of employment growth	Density of employees per hectare
Commerce	45%	80
Heavy industry	18%	20
Light industry	13%	35

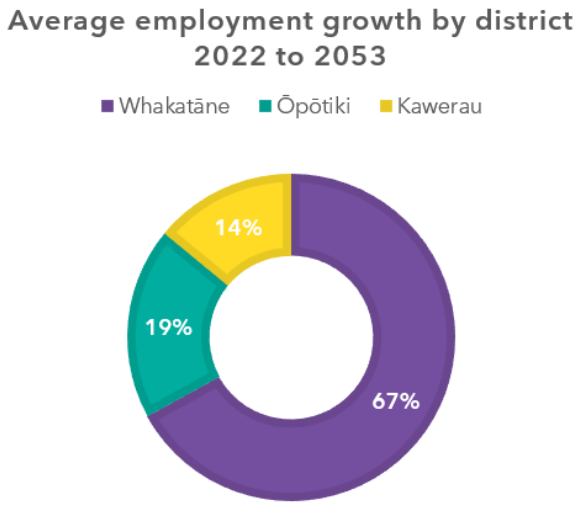

Figure 14: Average employment growth

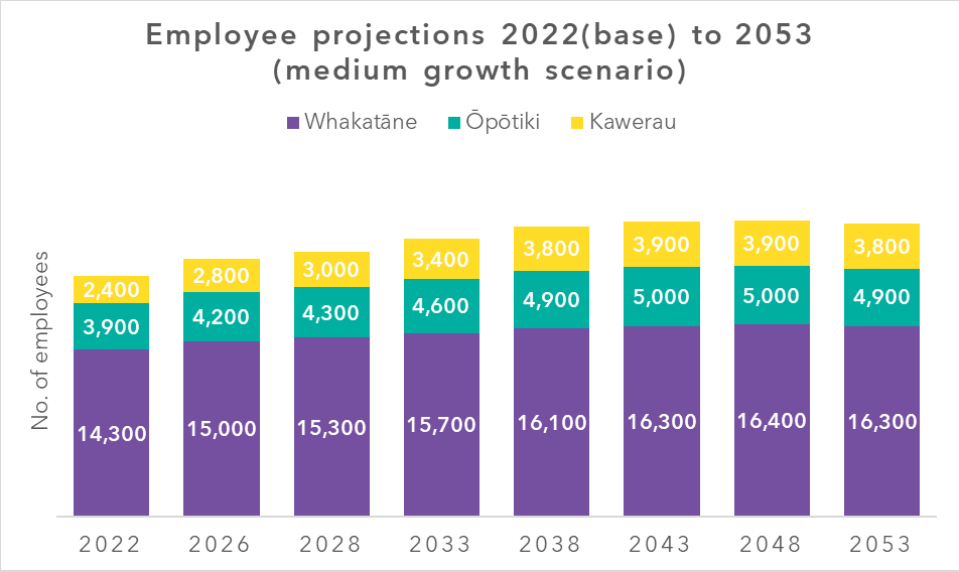

Figure 15: Employee projections

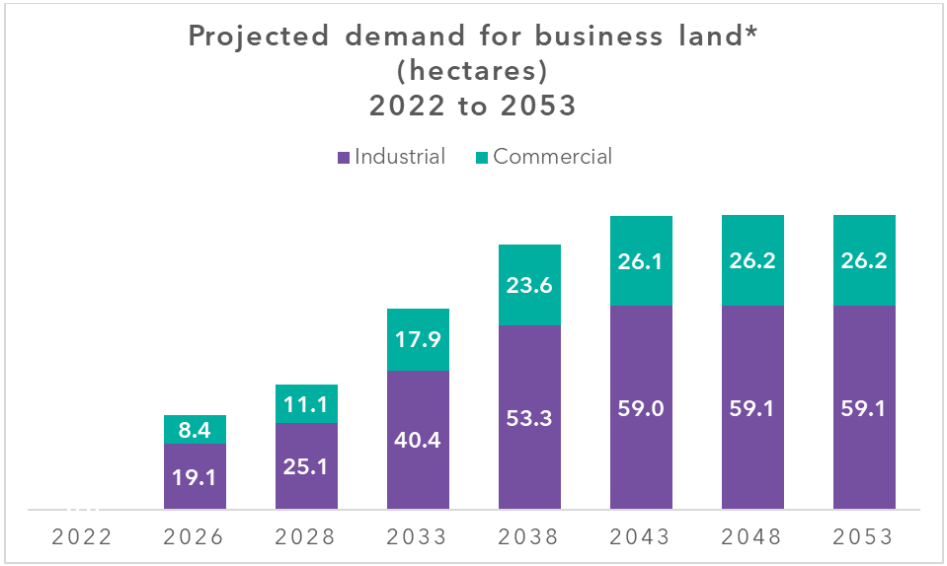

Figure 16: Projected demand for business land

6.1 Demand by district

Commercial land projections have not been separated by district because of how interdependent the economic markets for these three districts are. As a guide for the purposes of this report, it is assumed that the share of employment growth projected provides an indication of where demand for commercial growth may occur and, therefore, the following split forms the basis for decisions being made through this report.

Table 8: Time categories for business land

Time period categories used for employee and business land projections

Year	Description
2022-2027	Short-term
2028-2037	Medium-term
2038-2053	Long-term

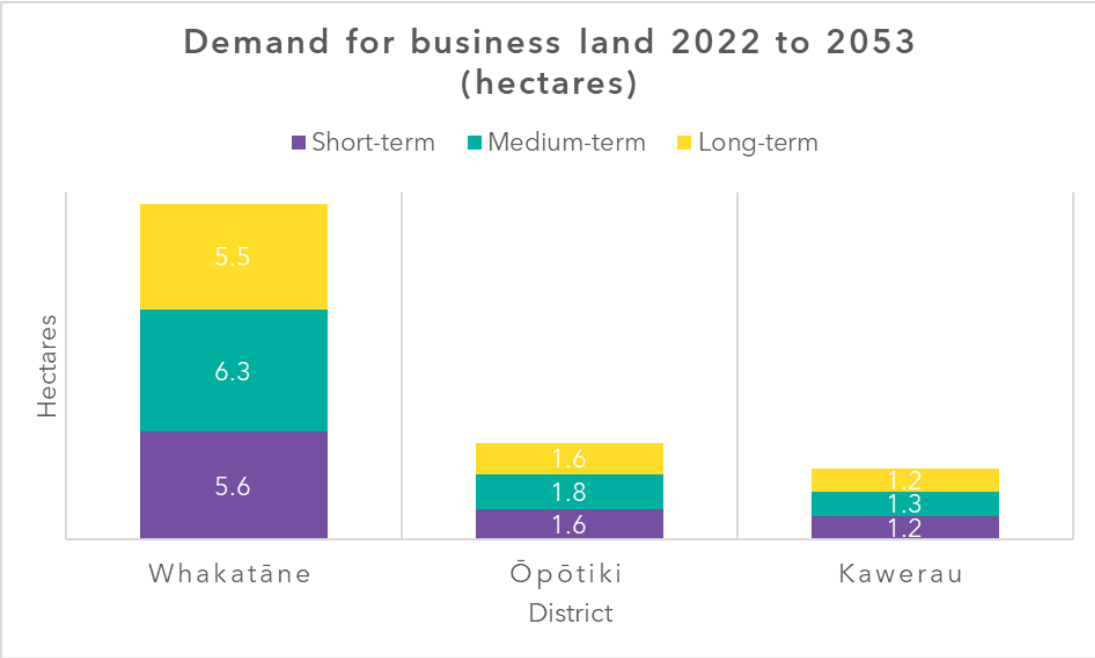

Figure 17: Demand for business land

6.2 Comparison to business land supply

Kawerau (3.5 ha projected demand for commercial land by 2050, large-scale industrial land capacity available)

Kawerau district is considered unlikely to require additional land for business purposes, given the industrial land supply being enabled through Putauaki Industrial Zone and land transfer from Whakatāne district and there are several vacant commercial premises within town, anecdotally. The projected 60 ha industrial sub-regional industrial demand can be accommodated by available land supply in Kawerau.

Kawerau's total land area is 23.58 km^2 and of this, land zoned for industrial purposes is 3.93 km^2. Kawerau district currently has 94.9 ha of undeveloped land zoned industrial, with 79.9 ha of this located within the new Putauaki Industrial Zone. There is no additional land zoned for future commercial development, although some redevelopment or intensification of existing commercial areas is expected to be possible. A boundary adjustment in 2024 allowed for additional land to be transferred from Whakatāne district to Kawerau district. This will add 287 ha to Kawerau district, including to expand Putauaki Industrial Park.

Whakatāne (up to 18 ha projected demand for commercial business land by 2050)

Given the sub-regional service centre role that Whakatāne township plays, it is likely that additional commercial land will be required in all time periods and there may be a shortfall in the township where most of the demand is likely to be situated.

A preliminary business land survey undertaken in 2022 showed 8 ha of light industrial land and 2 ha of commercial land available over the short and medium term (e.g., 2022-2032) throughout the district. This land is considered infrastructure ready, due to the location of these sites being near existing infrastructure networks.

2 ha commercial zoned land, including 1 ha of available commercial sites within Whakatāne township, mainly through infill/redevelopment, and, therefore, considered less likely to be realised than comparable greenfield sites. There was a small amount of commercial zoned land identified in Tāneatua (0.2 ha), and a further 0.6 ha of commercial zoned land in Murupara.

9.3 ha industrial zoned land located close to Whakatāne township is zoned industrial purposes and is available for development.

With a projected forecast demand for around 18 ha of commercial business land and a potential 10 ha supply, there is likely need for up to 10-18 ha more commercial business land. This figure assumes a portion of the identified 2 ha commercial land supply will not redevelop as it is less feasible, and that some of the industrial zoned land could become commercial zoned instead. This is because industrial land should primarily be encouraged to locate at Kawerau in the Putauaki Trust industrial development area, freeing up this land for commercial purposes.

A secondary investigation should be undertaken to determine where this demand could be met, to inform the upcoming district plan. This report and process has not undertaken a thorough assessment of where commercial land could take place nearby Whakatāne township or smaller settlement areas in the district.

Ōpōtiki (5 ha projected demand for business land by 2050, and a growing industrial land demand)

Currently, there is insufficient industrial zoned land available in Ōpōtiki district, and there are several options for where this can be accommodated south of the township and within the Hukutaia Development Area. There is sufficient land already available to meet commercial land needs within Ōpōtiki township through redevelopment or infill.

More industrial land is needed because of demand expected from current investment into over 10,000 ha of water space planned for aquaculture north of Ōpōtiki township and Te Kaha, as well as the construction of the sea walls that support the marine farming and other commercial vessels.

The expansion of the mussel processing factory for the sea farms can be accommodated within the industrial zoned land, but there is not sufficient land available for additional, new industrial activities within Ōpōtiki.

There is undeveloped land adjoining the two existing industrial areas to the south of the township and north of Hukutaia Development Area, however, no land has been zoned. Iwi owned land intended for the mussel spat hatchery along the east coast has been identified but has not been zoned for these purposes.

Overall, there are some options for industrial land expansion but insufficient industrial zoned land available in Ōpōtiki district to meet the needs of businesses over the next 30 years. Ōpōtiki District Council is currently undertaking a separate investigation into the quantum of industrial land required and where it could go.

7 Scenario and development options

This section describes the methodology and process for identifying and developing high-level scenarios and development options with a focus on residential demand projections. It describes the results of scenario analysis undertaken which informs the growth planning component of the Spatial Plan.

7.1 Scenario methodology

Scenarios are used to:

- Explore how multiple drivers of change can come together to shape different futures and what this means.
- Help stakeholders envisage and engage with multiple futures.
- Identify a preferred scenario/s that can be used as a desired future/s that the policy can work towards achieving.

The Scenario Method helps to develop effective scenarios for the spatial plan and enhances resilience to unforeseen events. Rather than predicting the future, this approach explores a range of possibilities, highlighting the potential opportunities and challenges each scenario may present for future housing and business land development in the Eastern Bay. For scenarios to be effective, they must be plausible, consistent and offer insights into the future. Factors that have been considered in the process of identifying and refining the scenarios are outlined in the previous sections of this report. The evaluation was informed by a range of information, data, and analysis, including:

- Spatial analysis of the natural and physical resources that constrain or shape growth.
- Drivers/challenges, like the population and employment.
- Planning frameworks established by the district plans.
- A stocktake of current developments underway, committed or planned proposals.
- Spatial analysis of residential and business development capacity.
- Availability of Three Waters infrastructure, social infrastructure, transport, and electricity.

The scenarios explore diverse ways to respond to the drivers and challenges. A preferred scenario for the settlement pattern and development options for future implementation needs to be identified to provide for the projected growth, while responding to the local context and environmental constraints.

7.2 Scenario and development options process

The process of developing scenarios, assessing the scenarios, defining development options, further analysing, and testing the development options, and identifying a preferred scenario for the settlement pattern is set out in Figure 18. A summary of each step in the process is also provided below. The scenarios and development options were evaluated during a series of workshops by subject matter experts from across the Council, and with iwi, and key stakeholders.

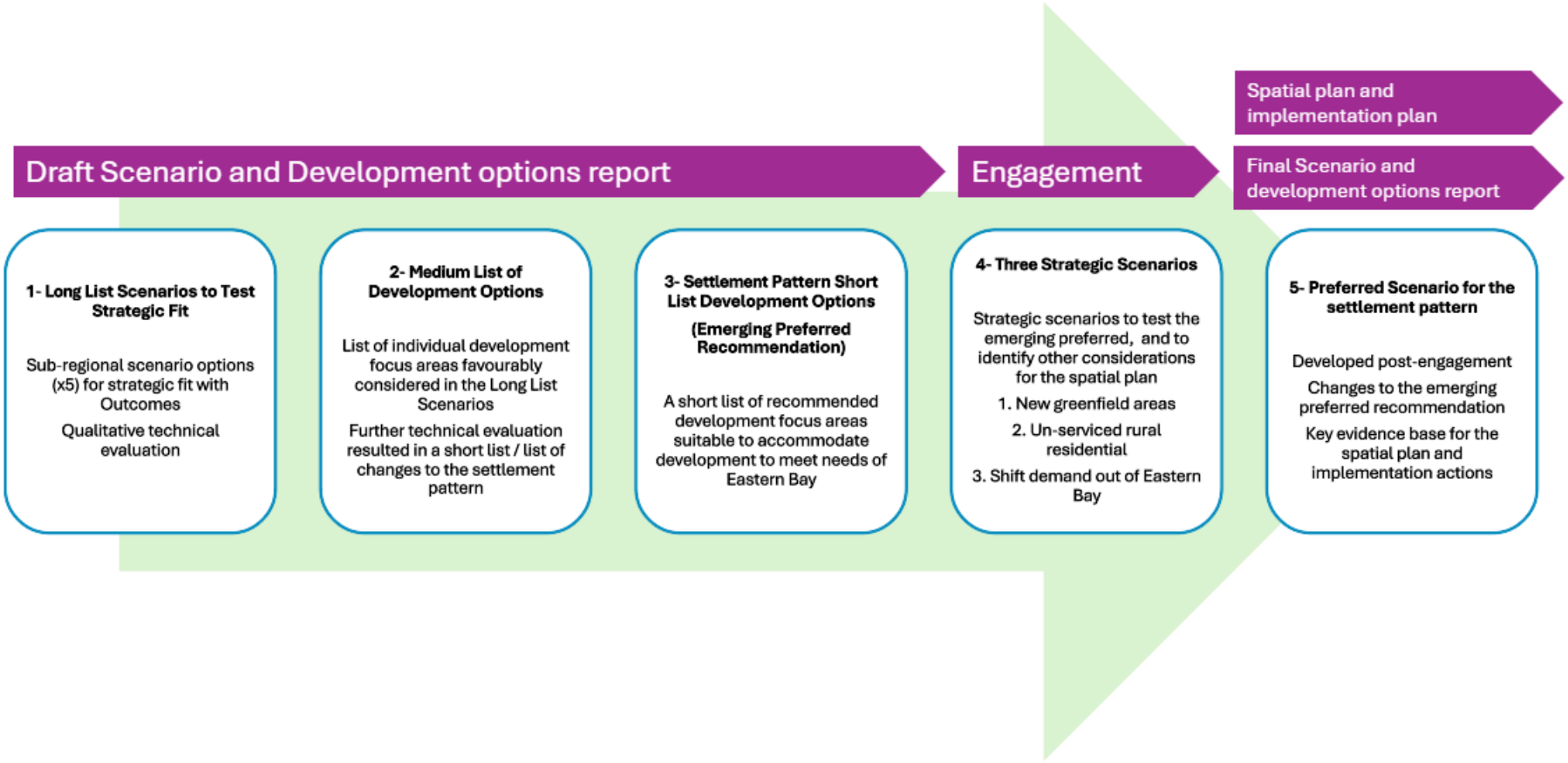

Figure 18: Scenario and development options report process

8 Step 1: Long List Scenarios

The development of the Long List Scenarios ensures a range of integrated factors are considered when making decisions on growth options. The evaluation resulted in a set of possible development options that were considered worthy of additional research.

The long list of scenarios was developed to test spatial configurations of land use changes in a technical process. Workshops were held at Kawerau, Whakatāne and Ōpōtiki District Councils with relevant technical staff in early 2023, followed by a sub-regional transport workshop, to develop and test the scenarios. Constraints mapping (e.g., natural hazards, highly productive land, and natural areas) was used to inform the development of scenarios by applying high level constraints and considering no-go areas. A consistent set of spatial parameters and assumptions were applied to the scenarios to ensure consistency.

The Long List Scenarios (shown in Figure 19 and detailed in Table 9) span a range of intensification and location options. The evaluation process assessed the land and infrastructure factors, and all scenarios were premised on a 30-year demand for around 4,000 dwelling units with the assumption that papakāinga will take place to meet demand as needed (this figure was later revised when new information became available).

To evaluate scenarios, decision making criteria were developed that reflect the goals from the Outcomes Framework. The evaluation process assessed the strengths and weaknesses of the scenarios and focused on the central corridor to identify a medium list of plausible development options to take forward for additional review because they had a higher likelihood of meeting the spatial plan's goals.

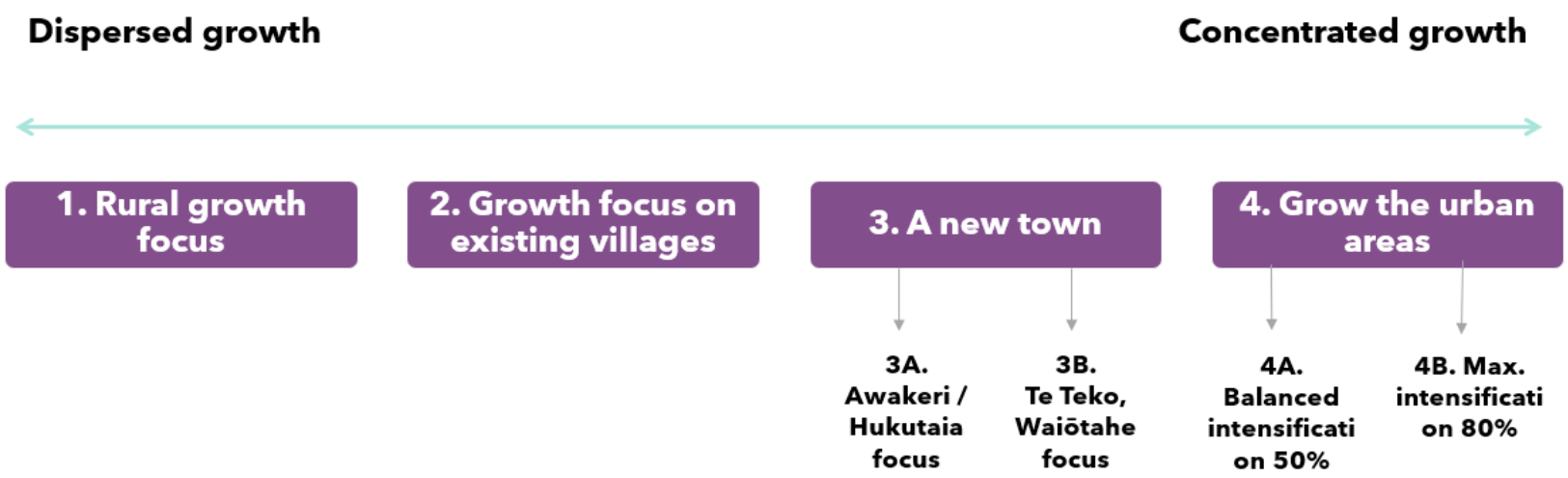

Figure 19: Long list scenarios

8.1 Design principles

The long list scenarios were developed by applying design principles to generate diverse ways to accommodate projected housing demand across the sub-region and were primarily focused on the urban central corridor as this is where most demand for urban growth and investment is expected. The principles were drawn from a variety of policy sources relevant to the Eastern Bay and each relate to a goal and enabler of the outcomes.

Long list scenario design – *locational* principles

- Avoid locations where natural hazard risk and effects of climate change cannot be practicably and equitably managed, like areas at risk of coastal erosion and cliff instability.
- Avoid / mitigate impact on areas to protect and conserve, like highly productive lands, natural areas, and culturally significant areas.
- First work with locations where there are existing settlements and infrastructure before contemplating new growth areas and infrastructure.

Long list scenario design – *performance* principles

- Enable certainty of a sufficient zoned and serviced land supply for residential and business purposes.
- Placemaking to support community wellbeing outcomes.
- Residential development and economic development are mutually supportive and should be considered at the same time.
- Enable and support Iwi/hapū to use their land for their aspirations, to unlock opportunities that development can provide for.
- Consider the changing needs of housing types due to shifts in demographics.
- Define a settlement pattern that supports achievement of net zero greenhouse gas emissions by 2050 and can adapt to the impacts of climate change.

8.2 Long list evaluation factors

Long list assessment factors were defined, based on the goals to focus on strategic fit with policy and overarching natural hazards and other constraints. They were intended as a coarse filter to net out poor performing concepts early, and to result in a medium list of plausible options to consider at a more detailed scale. The strategic fit criteria included the following:

- **Well-functioning urban environment**: access between housing, jobs, community services, natural spaces and open spaces.
- **Public infrastructure**: ability to connect to existing or planned three waters infrastructure, transport infrastructure and services.
- **Financial**: Capital costs of the scenario and operational costs of the scenario.
- **Complexity**: how straightforward is it to implement the scenario and are there unacceptable technical risks involved in implementing the scenario?
- **Adaptability**: to uncertainty and change (i.e., rate of demographic change, climate change, economy).

8.3 Long list scenario evaluation

Table 9: Long list scenario evaluation

Rural growth focus – Scenario 1 To provide immediate housing capacity with low effect on public and wastewater requirements, rural residential development is prioritised across the sub-region.	**Opportunities:** ⊕ Development driven by demand; infrastructure can be provided as required without large upfront capital investments by the Council. ⊕ Provides choice of location for new homes. ⊕ Attractive to rural landowners wishing to subdivide, supports economic development in rural areas.	**Challenges:** ⊗ Housing typology choice would not improve, growing mismatch with demographics. ⊗ Dispersed growth makes it challenging to plan for the infrastructure needed. ⊗ No efficiency and difficult to offset infrastructure costs through development charges. ⊗ Increased maintenance and operational costs to maintain rural roading network. ⊗ Likely to affect rural economy through reverse sensitivity to agricultural practices and loss of highly productive lands. ⊗ Challenging to meet climate change targets.
Growth focused on existing villages – Scenario 2 Growth focuses on existing villages around Awakeri and Te Teko, with expansion around Coastlands and in Hukutaia. Rural residential development focuses on the coastal areas and hillsides offering expansive views.	**Opportunities:** ⊕ Enables planned growth to be staged; trigger points can be identified for future upgrades. ⊕ Can connect to existing or planned three waters infrastructure in Whakatāne and Ōpōtiki. ⊕ Expands housing choice and allows small centres to develop more services. ⊕ Growth clustered around existing corridors and settlements generates more economies of scale than Scenario 1.	**Challenges:** ⊗ Adaptable but hard to plan for. Doesn't allow real efficiencies to be gained because growth takes place on many different fronts at the same time. ⊗ Conflicts with natural hazards – Te Teko, Edgecumbe, Ōhope, Tāneatua and others. ⊗ For Ōpōtiki, it does not provide an alternative sizeable development that can be developed as an alternative to the Town Centre if retreat is required. Reinforces commitment to status quo in Ōpōtiki Town Centre and current flood risk.

A new town (Awakeri and Hukutaia focus) – Scenario 3A While there is some infill taking place, most development occurs as structure planned greenfield development areas. Most growth focuses around Awakeri in the west, and Hukutaia to the east in a staged manner. There is little to no rural residential development under this scenario. It is assumed that papakāinga takes place as part of background growth, where there is demand and suitable land.	**Opportunities:** ⊕ Can plan growth and development can be staged. Low complexity and greater ability to recover costs from developers. ⊕ Public transport likely to be cost effective and attractive for both Awakeri and Hukutaia. ⊕ Good walking/cycling links between Hukutaia to Ōpōtiki and Awakeri / Whakatāne can be developed. ⊕ Awakeri and Hukutaia are both resilient to natural hazard risks and development would be required to meet appropriate standards.	**Challenges:** ⊗ Significant upfront investment required ahead of new growth areas. ⊗ Risk of over-design and investment risk if growth does not materialise. ⊗ Awakeri sits across two state highways which are key freight routes requiring careful planning for local connectivity.
A new town (Te Teko, Waiōtahe focus) – Scenario 3B While there is some infill taking place, most development occurs as structure planned greenfield development areas. Most growth focuses on Te Teko in the west, and to the east in Ōpōtiki most of stage one of Hukutaia is developed but most change occurs at Waiōtahe / The Drifts, including along Paerata Ridge. There is little to no rural residential development under this scenario. Kawerau sees some greenfield growth in the southwest part of town. It is assumed that papakāinga takes place as part of background growth, where there is demand and suitable land.	**Opportunities:** ⊕ Te Teko already has some community infrastructure and can easily link to Kawerau. ⊕ Lower maintenance and operations costs than other scenarios. ⊕ Mode shift to public transport, and some walking/cycling viable.	**Challenges:** ⊗ Significant upfront investment required ahead of new growth areas. Risk of over-design and investment risk if growth does not materialise. ⊗ Expanded growth in Waiōtahe and Paerata challenging from an affordability perspective. Waiōtahe can't sufficiently support future growth. ⊗ Waiōtahe does not deliver a resilient alternative to Ōpōtiki township. ⊗ Te Teko township is protected from the Rangitāiki River by stopbanks that are designed and maintained to contain a 1% AEP event. There are remaining risks associated with stopbank failure and events that exceed the design capacity still exist due to the poor underlying ground conditions.

Grow the urban areas (intensification 50%) – Scenario 4A	**Opportunities:**	**Challenges:**
This scenario assumes that a balanced division of new housing takes place between infill and greenfield growth. In Whakatāne area, growth spreads towards Coastlands. In Ōhope there are greenfield growth areas south and enroute to Whakatāne. In Ōpōtiki, there is some growth around Waiōtahe / The Drifts, and rural residential developments into Paerata Ridge. Most growth in Kawerau takes place as greenfield development.	⊕ Whakatāne and Kawerau - can plan and upgrade infrastructure as required with a lower complexity approach than some other scenarios. ⊕ Intensification will reduce vehicle kilometres travelled on average and reduce carbon emissions. ⊕ Good local access to places to learn, play and work.	⊗ Difficult to recover capital costs of improved infrastructure. Increased pressure on existing green spaces and community facilities. ⊗ May not meet needs of growing businesses or landowners in eastern Ōpōtiki wishing to subdivide or provide accommodation. ⊗ Unlikely to be feasible due to degree of changes entailed and prior limited uptake of infill / redevelopment. ⊗ Kawerau greenfield development not a viable option for landownership pattern reasons. ⊗ Compounds issues of accessibility to services for existing rural communities in Whakatāne. Risks disenfranchising the rural community. ⊗ Challenging for Ōpōtiki wastewater services in the township. Substantial unplanned upgrades would be needed.

Grow the urban areas (intensification 80%) – Scenario 4B This scenario assumes that intensification and infill are highly successful, and there is only a small amount of greenfield expansion. In Kawerau, most infill takes place south and east of the town centre. Change in the urban nature of both Whakatāne and Ōhope is extensive. Similarly, in Ōpōtiki there is minor greenfield development around Waiōtahe and extensive infill in town, with some growth of early stages of Hukutaia.	**Opportunities:** ⊕ Can plan and upgrade Town Centre infrastructure as required. ⊕ Maintenance and operation costs lower than other options. ⊕ Public transport becomes more cost effective with partial cost recovery possible.	**Challenges:** ⊗ Whakatāne – large area of town unsuitable for intensification due to flooding risk. Will need new green spaces and facilities to meet demand. Increased stormwater management costs. Car mobility difficult during peak periods. ⊗ Ōpōtiki township – Infill increases flooding risk. Overall, doesn't meet needs of rural areas where many jobs away from town centre. Reduces autonomy for rural landowners and businesses wanting to develop for residential purposes. Reduces housing location choice by restricting choices into urban areas and away from rural residential. ⊗ Kawerau greenfield development not a viable option for landownership pattern reasons. ⊗ Relies on private market to provide infill housing product at scale where this might not be economically feasible at scale. ⊗ Car mobility difficult during peak periods in Ōpōtiki/Whakatāne, will become particularly difficult during busy holiday periods and may impact on Whakatāne's attractiveness as a holiday destination. ⊗ Compounds issues of accessibility to services for existing rural communities in WDC. Risks disenfranchising the rural community.

9 Step 2: Medium List Development Options

The assessment of the Long List Scenarios resulted in a defined list of plausible place specific development options. The medium list of development options is a result of the consistently identified 'good ideas' in the Long List Scenarios. These provide a set of options for where development could go, which are more likely to be feasible.

Several locations were assessed for suitability, including:

- Land that could be rezoned for Residential in the future (Greenfields expansion of existing towns/villages).
- Existing zoned Residential land that could be earmarked for higher density living (Infill).
- Land that could be developed in rural locations (Rural residential).

This stage of the process also included a high-level assessment of infrastructure considerations for the development options in each district and from a sub-regional perspective. Varying degrees of analysis have been undertaken for each option, depending on the information available which varied considerably between locations.

9.1 Medium list assessment principles

Below are a set of assessment principles informed by the Spatial Plan goals which have been used to differentiate between the development options and each options performance potential. These principles provide an analysis of the infrastructure, environmental, social, and cultural constraints to future housing and business. A development option that is appraised 'good' should have good alignment to the Spatial Plan goals and meet technical considerations around constraints or infrastructure.

Assessment principles:

1 Location is resilient to climate change and natural hazards.

2 Connection to existing or planned three waters infrastructure is feasible and cost-effective (for greenfield towns, new infrastructure would be planned) OR is self-sufficient (e.g., not connected, use septic tanks, etc).

3 Cost of roading / transport connections and infrastructure improvements is feasible and affordable.

4 Has good connections to jobs and proximity to existing or planned economic growth areas (both urban and rural locations).

5 Capacity to address bulk of future growth needs / achieves staged development sequencing over time.

6 Good accessibility to community services (includes healthcare, supermarket, open space/green space) OR development is at a scale that new community services would be provided at the location.

7 No rural residential development on Highly Productive Land (except for papakāinga).

8 Location has no known social, environmental, cultural, or economic matters that affect development (for example including external impacts on developability, interdependencies on other projects/actions; landowner aspirations for land, etc.).

The medium list of development options (with a focus on residential options) are shown in Figure 20 below.

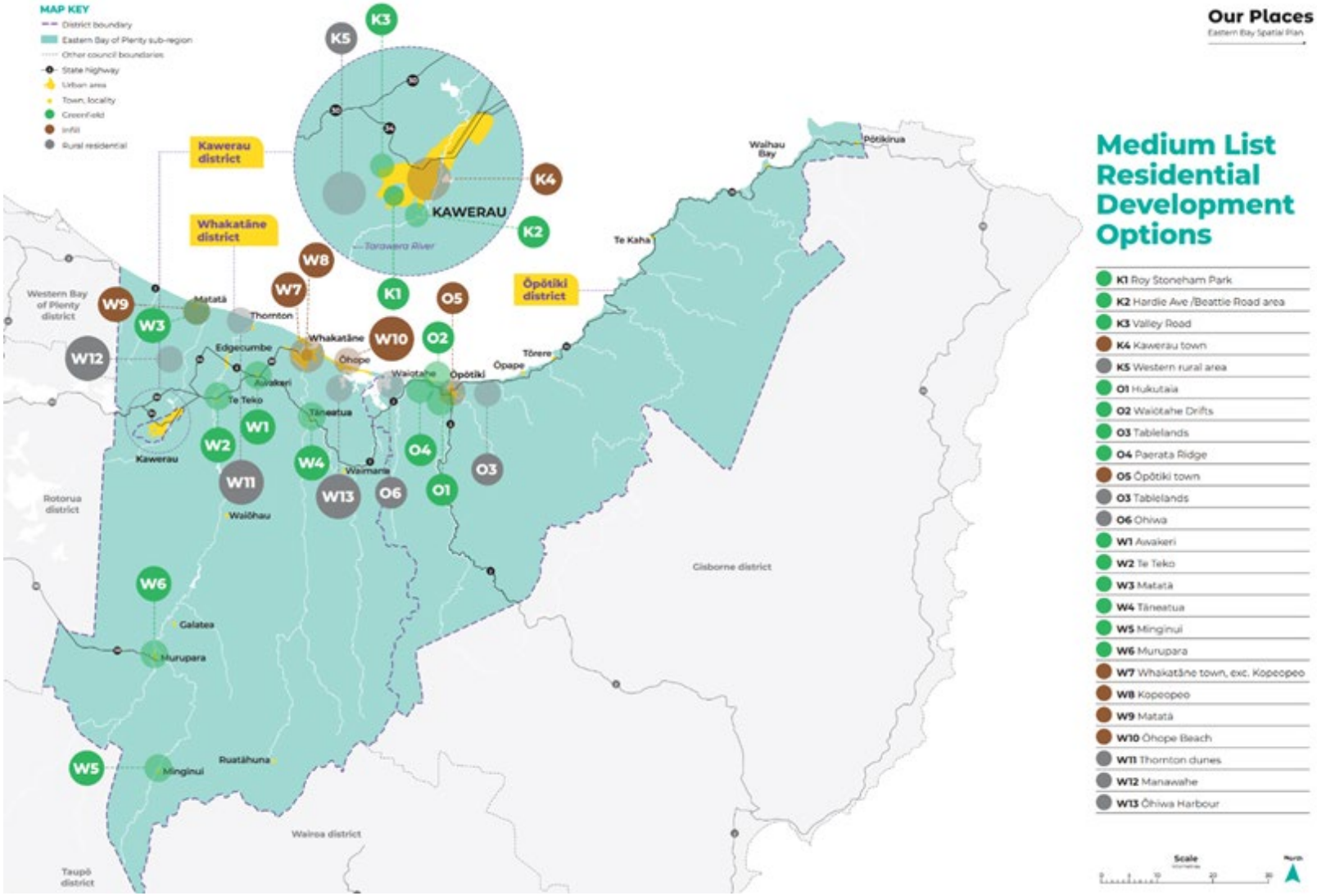

Figure 20: Medium list development options

9.2 Medium list – Infrastructure assessment considerations

There is a projected demand for appropriately located and zoned land to provide for the expansion of residential, commercial, and industrial land uses. For some areas, there will be a negligible effect on services and infrastructure. However, the cumulative provision of residential growth over the short, medium, and long term could result in some significant upgrades in the future. The specifics of what and when, depend on the priority given to each area, the population growth of those areas, and the activities they support.

A qualitative assessment of the impact of the development options on types of infrastructure throughout the sub-region has been undertaken. The assessment of the options for education, three waters, transport and electricity infrastructure impacts are set out below.

9.3 Three Waters

CKL were appointed to provide professional advice with respect to three waters services and infrastructure. CKL have undertaken a staged approach to investigation, analysis and evaluation of services and infrastructure in the Eastern Bay.

Stage 1 Report

This included the identification of constraints, implications and opportunities for three waters infrastructure relating to the long-list scenarios. The Stage 1 report informed the process undertaken by the Technical Working Group in creating place specific development options, creating the medium list development options from the long list options.

Stage 2 Report

A Stage 2 report provides an evaluation of the medium list development options as it relates to three waters infrastructure. Table 10 below provides an overview rating of medium list development options. The Stage 2 report is included as Appendix 2.

Table 10: Medium list three-waters consideration

Rating	Option Area (Grouped)	General Evaluation Rating
Good	**O1 Hukutaia – greenfield** **W5 Minginui – greenfield** **W8 Kopeopeo – infill** **W9 Matatā – infill** **K1 Roy Stoneham Park – greenfield** **K2 Hardie/Beatie Ave area – greenfield** **K3 Valley Road – greenfield** **K4 Kawerau town – infill**	**O1 Hukutaia – greenfield** • Hukutaia currently has an adequate supply of water for low growth and further upgrades would support staged planned growth. • There are two options for wastewater to service growth, with the short to medium term intention to upgrade connectivity to the existing Ōpōtiki wastewater treatment plant. • The concept design of the stormwater management to support the growth area has been undertaken and assessment and management of effects on downstream drainage systems to be investigated. **W5 Minginui – greenfield** • Minginui has no Council reticulated three waters infrastructure. There is an aspiration for an additional fifty dwellings which could be accommodated with the existing infrastructure. • The bore water supply scheme is managed by Ngāti Whare Trust and is covered by renewal programmes. Similarly with the wastewater treatment system. **W8 Kopeopeo – infill** • Water supply and storage would be adequate to support low/short-term growth, however, investigations are needed to connect to a more resilient supply, such as the proposed primary and secondary mains from Paul Road or Braemar Road. • The option to expand the wastewater treatment plant in Whakatāne is being considered. • Kopeopeo is at a slightly higher elevation than the Whakatāne CBD area, with the stormwater network, including a pumped discharge to the Whakatāne River. The wider area would benefit from catchment wide modelling which includes climate change considerations to guide planning. **W9 Matatā – infill** • Matatā has an adequate water supply for short term growth with minimal upgrades required. Longer term growth will require water upgrades.

Rating	Option Area (Grouped)	General Evaluation Rating
		• Matatā is currently on septic tanks and could remain as such for infill development in the short term. In the longer term, wastewater reticulation and local treatment/land disposal are being considered. • Stormwater management is subject to the effects of climate change, including coastal inundation, sea level rise and groundwater interaction. Stormwater is discharged through to the current stormwater system which includes wetlands. Further analysis would be required of pipe and wetland capacity to support any future connections. **K1 Roy Stoneham Park and K2 Hardie/Beattie Ave area – greenfield** • Water supply source and volume of storage is adequate to accommodate growth and there is a sufficient contingency supply available. However, this is dependent on renewal of water take consents, which in turn may require upgrades to infrastructure to ensure compliance with drinking water standards and additional storage. • There is sufficient capacity at the existing wastewater treatment plant and disposal area. There is an option to extend the disposal area (pumice fields) if required. • For Roy Stoneham Park, there is sufficient stormwater capacity. For Hardie/Beattie Ave area, there are existing groundwater issues that would need to be addressed in stormwater design. **K3 Valley Road – greenfield** • As above, there is existing capacity to service growth. This area is already zoned for residential, however, this area has topographical challenges which make it difficult to develop. **K4 Kawerau town – infill** • As above, there is existing capacity to service growth. • Stormwater design for infill will need to be cognisant of the existing pipe capacity.

Rating	Option Area (Grouped)	General Evaluation Rating
Fair	**O5 Ōpōtiki town – infill** **O4 Paerata Ridge – rural residential** **O5 Tablelands – rural residential** **O6 Ōhiwa – rural residential** **W1 Awakeri – greenfield** **W3 Matatā – greenfield** **W4 Te Teko – greenfield** **W6 Murupara – greenfield** **W7 Whakatāne town (excluding Kopeopeo) – infill** **W10 Ōhope Beach – infill** **W11 Thornton Dunes – rural residential** **W12 Manawahe – rural residential** **W13 – Ōhiwa Harbour – rural residential** **K5 – Western rural area – rural residential**	**O5 Ōpōtiki town – infill** • Water supply and storage would be adequate to cater for infill development, potentially requiring some upgrades which could be catered for in the renewals budget. • Infill development in Ōpōtiki township will need a controlled approach, given the exposure to flood risk in some parts of the township. Key flood resilience projects are underway which include the following: ▪ Rural-Urban flood protection with southern limit of Duke Street. ▪ Transfer of flood flows from Otara to Waioeka River floodplain. ▪ Duke Street Pump Station. ▪ Tarawa Creek Pump Station upgrade. • The Bay of Plenty Regional Council Waioeka/Otara River model is currently being updated to provide background for the overall 100-year river strategy. • Upgrades are required for the Ōpōtiki Wastewater Treatment Plant, pumpstations and reticulation, to cater for growth in Hukutaia. **O4 Paerata Ridge – rural residential** • Paerata Ridge has limited rural growth potential without upgrades to infrastructure. • The area is self-sufficient, with private bore water, reticulation/water harvesting and septic tanks. • Stormwater management would need a catchment-wide approach to achieve the best practicable outcomes. Discharge will need on-site management without affecting downstream properties. **O5 Tablelands and O6 Ōhiwa – rural residential** • Tablelands is self-sufficient with onsite septic wastewater and stormwater management. Water supply would continue to be fed from existing sources, i.e., rain tanks (harvesting). **W1 Awakeri – greenfield** • Awakeri has water supply and storage constraints (low elevation and low capacity) however, there is the option to link to a proposed primary trunk main

Rating	Option Area (Grouped)	General Evaluation Rating
		from Ōtūmahi water reservoir which will improve pressure and flow and add resilience. • Wastewater reticulation, treatment and disposal would need further consideration. There are two options which include either reticulating and pumping wastewater to the upgraded treatment plant in Whakatāne (requiring a new pipeline and pump station) or developing a new wastewater treatment plant in Awakeri. Further investigations of costs and land availability would be required. • A catchment wide stormwater management plan would provide comprehensive guidance as to the best practicable options for managing the effects of urban development in this area. **W3 Matatā – greenfield** • Matatā is subjected to the effects of climate change, including coastal inundation, however, there is growth potential to the eastern area of Matatā. The growth in the eastern area would benefit from a catchment wide approach to stormwater management, which also integrates with urban planning and green infrastructure for resilient outcomes. • Water supply from Jennings Spring is currently adequate to support growth in the short to medium term and a future connection to the Braemar water supply would support additional growth. Further investigation is required to assess storage requirements for long-term growth. • Matatā is on septic tanks, and the growth potential is dependent on the ability to treat and dispose of wastewater. An option for reticulation, treatment, and disposal of wastewater for short term growth is being planned. For additional capacity in the east of Matatā to be realised, further investigation is needed of the availability of land for an extensive land disposal area. **W4 Te Teko – greenfield** • Growth at Te Teko would require consideration of options to address water and wastewater constraints, alongside consideration of stormwater management options for managing the effects of urban development in this rural area. Residential growth relies on engineered stormwater management options to be sympathetic to the Rangitaiki drainage scheme outcomes. • A catchment wide Stormwater Management Plan would determine the best practicable options for managing the effects of urban growth and integration with the current residential development.

Rating	Option Area (Grouped)	General Evaluation Rating
		• Water supply is from a bore, water treatment plant and reservoir and is also linked to the Plains scheme. Growth would require reticulation and upgrades to pipes and storage. • Te Teko is currently on septic tanks and would require a new wastewater reticulation, treatment plant and disposal area. **W6 Murupara – greenfield** • There is an aspiration to develop an additional 300 houses at Murupara and existing sections are large providing for infill options. • Water supply is sourced from a shallow spring, however, with no treatment plant. Upgrades would be needed to accommodate additional dwellings. • The wastewater treatment (pond) consent needs renewal (2026) and upgrading to cater for any potential growth. • The area would benefit from a catchment wide stormwater management plan, to determine the best practicable options for managing stormwater. **W7 Whakatāne town (excluding Kopeopeo) – infill** • Whakatāne township, excluding Kopeopeo, has limited infill growth potential due to higher risk profiles to natural hazards. • Water supply and storage would be adequate to support low/short term growth; however, investigations are needed to add resilience to the water supply. • The option to expand the wastewater treatment plant in Whakatāne is being considered. This would potentially accept wastewater from Awakeri for ocean discharge. • Improving resilience of the stormwater system is currently underway, with pump stations being upgraded or assessed for increased design capacity, given the climate change risks and upgrades to the Whakatāne River stopbanks. • The area would benefit from catchment wide modelling, which includes climate change considerations to guide planning.

Rating	Option Area (Grouped)	General Evaluation Rating
		W10 Ōhope Beach – infill • There is enabled capacity for infill through the district plan. For growth, resilience of the stormwater management system is impacted by climate change risks. Analysis of the capacity of pipes would be required to support any future connections. • Water supply is currently from a connection from Valley Road reservoirs and Bridger Glade pumping station. A primary trunk main would provide additional supply resilience to reservoirs. • Wastewater can continue to be pumped to the Whakatāne Wastewater Treatment Plant. **W11 Thornton Dunes – rural residential** • The current water supply is limited by the supply line from the plains and limited growth could be accommodated. However, the option to increase the pipe size and storage to accommodate supply for any future growth could be considered. • The area is currently on septic tanks for wastewater disposal. Significant future growth would require a localised treatment plant and disposal area. • Stormwater management would need to have a catchment wide approach to achieve the best practicable outcomes. Any further growth would require on-site management of stormwater without effecting downstream properties, and consideration of the effects of discharge to/through the Rangitāiki Drainage scheme. **W12 Manawahe – rural residential** • Water supply would continue to be provided from existing sources, i.e., rain tanks. • Wastewater disposal would continue to be in septic tanks. • Stormwater management would need to have a catchment wide approach to achieve the best practicable outcomes. Any further growth would require on-site management of stormwater without affecting downstream properties. **W13 Ōhiwa Harbour – rural residential** • Water supply would continue to be fed from existing sources, i.e., rain tanks. • Wastewater disposal would continue to be in septic tanks.

Rating	Option Area (Grouped)	General Evaluation Rating
		• Stormwater management is subject to the effects of climate change, including coastal inundation, sea level rise and groundwater interaction. **K5 Western rural area – rural residential** • Rural residential water supply would continue to be provided from existing sources i.e., rain tanks. • Stormwater management will need to have a catchment wide approach to achieve the best practicable outcomes. Stormwater discharge would need on-site management without affecting downstream properties.
Poor	**O2 Waiōtahe/The Drifts – greenfield** **O4 Paerata Ridge – greenfield** **W4 Tāneatua – greenfield**	**O2 Waiōtahe/The Drifts – greenfield** • Waiōtahe / The Drifts has limited growth potential without upgrades to infrastructure. There are also limitations from flood/coastal inundation risk. • The stormwater management system includes disposal to ground via a communal soakage park, which would need to be upgraded by council or developer to accommodate any growth. • Waiōtahe currently has water supplied from Ōpōtiki and is supplied to a reservoir for balancing demand/pressure. Pressure at the entrance to the reservoir is low, as is residual pressure for fire demands, so upgrading of the supply will be required to accommodate growth. • The area is reticulated, and wastewater is pumped to Ōpōtiki for treatment. To accommodate any growth upgrades would be required. **O4 Paerata Ridge – greenfield** • The water supply is currently from bore water and reticulation is via a private scheme. There is a possibility of linking to the Ōpōtiki supply, but this is subject to cost investigations. • Wastewater treatment and disposal is likely to stay on septic tanks, however, there is an option to pump wastewater to Waiōtahe for transfer to Ōpōtiki Wastewater Treatment Plant subject to further cost consideration. • Stormwater management: The elevation for this area can provide good conveyance opportunities, treatment, and attenuation for stormwater to be provided in lower areas.

Rating	Option Area (Grouped)	General Evaluation Rating
		W4 Tāneatua – greenfield • Tāneatua is within a wider area under investigation for flood hazard risk and growth in this location is limited to a small amount of greenfield (to the north of the town) and infill development. • The water supply (bore) and wastewater treatment (pond) would need upgrading as part of the renewals programme. • Fluvial river flooding considerations could limit stormwater management options.

9.4 Education

The medium list development options can be catered to by the current schooling network, which has significant capacity and good transport options but is under pressure in parts. Proposed intensification via greenfield development options could create issues in the schooling network, which would require property solutions depending on the proposed number of houses and housing typologies.

Table 11 Medium list education considerations

Option area	Rating	Comments
W1 Awakeri – Greenfield	Fair	Significant development in Awakeri would put a currently nearly full schooling network under further pressure and would likely require a form of property response in the future as housing development came online.
O1 Hukutaia – Greenfield	Good	Hukutaia sits within the wider Ōpōtiki schooling network where there is capacity available, and the network could be balanced using enrolment schemes and property solutions where needed.
W2 Te Teko – Greenfield	Good	Te Teko sits within the wider Whakatāne schooling network and more specifically is close enough to Edgecumbe where there is capacity currently, that could be managed most likely with enrolment schemes and property solutions where needed.
O2 Waiōtahe – Greenfield	Fair	Waiōtahe is rural and sits in between the Whakatāne and Ōpōtiki networks. It is only serviced by one small rural primary school which would need further consideration if intensification was to move forward here. There is capacity at the neighbouring schools in

		the wider catchment, but access and feasibility would largely depend on where exactly planned future development would go.

9.5 Transport

Transport infrastructure, primarily state highways and rail are significant in the Eastern Bay, essential to enabling the flow of freight transporting Eastern Bay-made goods and resources and keep people moving between the districts and wider Bay of Plenty Region. State Highways 2, 30 and 35 connect the sub-region internally and provide a connection to external markets and services. The East Coast Main Trunk rail runs parallel to SH 2, connecting the sub-region to the Port of Tauranga, via Kawerau and Murupara, transporting logs, fertiliser, wood pulp, paper and cardboard to the port. An estimate of more than 33,000 containers per annum are exported from the Eastern Bay, primarily transported by truck on the highway network.

The sub-region's airport is located 9 km to the west of the Whakatāne township. The airport provides transport connections to Auckland, while also providing a means of travel to tourists who visit the region. There are also two airports located in neighbouring districts, in Tauranga and Rotorua.

A transport analysis was prepared for the spatial plan by Beca (Appendix 4) which assessed different land use scenarios.[16] Broadly, the impacts on the transport network under each of the development options can be managed through the right investment in infrastructure but there are pros and cons, and differing costs associated with each.

- Growth in and around existing centres will reduce carbon emissions but without investment in sustainable transport is likely to result in additional congestion on local networks and urban safety issues.
- Development of satellite communities will, if not supported by local services and employment, result in more travel and carbon emissions whilst putting people at risk if existing and anticipated safety issues on the network are not addressed.
- Rural growth is incredibly hard to plan for and would require a more proactive investment strategy and ultimately result in higher capital and maintenance costs or a reduced level of service for rural residents.

Regardless of the development option, significant investment in resilience for intra and inter regional trips will be required with all state highways increasingly prone to closures and with limited detour routes available. The current resilience of the East Coast Main Trunk Line is also questionable and further investigation and investment in this key rail line is necessary.

[16] Eastern Bay of Plenty Spatial Plan - Transport Analysis, Beca, June 2024

Future congestion and resilience issues into Whakatāne township will likely need to be addressed through investment in a second river crossing but is unlikely to be affordable without significant Government support. Addressing these key challenges will provide confidence for export-led businesses to invest in the sub-region and support employment and economic growth for the Eastern Bay.

Table 12 Medium list transport considerations

Rating	Option Area (Grouped)	Transport comments
Good	K1 Roy Stoneham Park – Greenfield	Many trips able to be contained within local area for employment, services and education reducing need for travel and in an area with good safety record. Short travel distances for many trips enable walking and cycling while a larger population base makes public transport locally and to other centres more viable. Reliable journeys for freight by road and rail within the EBOP. State Highway 2 (Matatā straits) and SH 30 (Rotoma) present ongoing reliability issues due to susceptibility to natural hazards and limited alternative routes. Potential improvements required: • Safety upgrades intersection SH 30/SH 34. • Increased traffic through Te Teko and Awakeri may require investment in crossing facilities to reduce severance effects. • State highway reliability improvements and/or upgraded detour routes.
Good	K2 Hardie/Beattie Ave area – Greenfield	
Good	K3 Valley Road – Greenfield	
Good	K4 Kawerau town – Infill	
Fair	K5 Western rural area – Rural residential	As per above, however, opportunity for walking/cycling and PT are diminished, although trips will still be relatively short and within cycling distance to Kawerau.
Good	O1 Hukutaia – Greenfield	Many trips able to be contained within local area for employment, services and education reducing need for travel. Local safety issues at key state highway intersections (particularly for Waiotahi) would need to be addressed, as would severance issues through Ōpōtiki township itself. Short travel distances for many trips enable walking and cycling, while a larger population base makes public transport locally and to other centres more viable. Likely to be an increase in local flooding issues in Ōpōtiki with existing problem exacerbated by additional infill housing and climate change.
Fair	O2 Waiōtahe Drifts – Greenfield	
Fair	O4 Paerata Ridge – Greenfield	
Good	O5 Ōpōtiki town – Infill	
Good	O4 Paerata Ridge – Greenfield	As per above, however, public transport viability diminished due to lower population density.

Rating	Option Area (Grouped)	Transport comments
Fair	**O3 Tablelands – Greenfield**	Too far from Ōpōtiki to support active transport modes and not a large enough population base to support local services (education, shops etc) resulting in increased vehicle traffic. Intersections on to state highway and Wainui Road would need to be addressed for safety and capacity while increased traffic will severance issues in Ōpōtiki.
Fair	**O3 Tablelands – Rural residential**	
Fair	**O6 Ōhiwa – Rural residential**	
Fair	**W1 Awakeri – Greenfield**	Dependent on scale of development, many trips able to be contained within local area for employment, services and education, reducing need for travel but likely to be dependent on Whakatāne for key services. Local safety issues at key SH 2 intersections would need to be addressed as would severance issues through townships. Close enough to Whakatāne support cycling trips with appropriate infrastructure for a large range of trips and opportunities to provide increased recreational opportunities. If scale of development is sufficient, may support good public transport links other centres.
Fair	**W4 Tāneatua – Greenfield**	
Fair	**W3 Matatā – Greenfield**	Dependent on scale of development, many trips able to be contained within local area for employment, services and education, reducing need for travel. Local safety issues at key SH 2 intersections would need to be addressed as would severance issues through townships. If scale of development is sufficient may support good public transport links other centres.
Fair	**W2 Te Teko – Greenfield**	
Fair	**W5 Minginui – Greenfield**	Will require a significant increase in scale to support local services, otherwise there will be a significant increase in transport demand to Murupara. Limited options for accessible transport options. Resilience of Natures Road may also be an issue.
Good	**W6 Murupara – Greenfield**	Some local services already exist and increasing population and jobs will enable these to expand and reducing the need for travel out of the centre. Additional population also improves the viability of existing public transport service to Rotorua. Reliable road connections to the north and west, and rail to the north, ensure reliable transport connections for people and freight. No significant safety or capacity issues.

Rating	Option Area (Grouped)	Transport comments
Good	**W7 Whakatāne town, excluding Kopeopeo – Infill**	Most trips able to be contained within local area for employment, services and education, reducing need for travel. Short travel distances for many trips enable walking and cycling, while a larger population base makes public transport locally and to other centres more viable. Local network capacity on arterials and across Whakatāne Bridge likely to become an issue without significant uptake in walking and cycling. Whakatāne bridge likely to be a significant resilience issue given this carries lifeline services, gas, telecommunications and electricity as well as the main transport task. Significant investment required. Potential improvements required: • Arterial capacity and safety improvements • Second river crossing • Investment in walking and cycling infrastructure within Whakatāne and to other centres where viable (Awakeri, Tāneatua)
Good	**W8 Kopeopeo – Infill**	
Good	**W10 Ōhope Beach – Infill**	
Fair	**W9 Matatā – Infill**	Increase in transport demand unlikely to be significant enough to warrant major investment. May require some additional facilities to improve safety in local areas.
Fair	**W11 Thornton dunes – Rural residential**	Thornton Road is highly susceptible to inundation, sea level rise, and localised flooding because of climate change and presents a significant resilience issue for development on this corridor. Too far from main centres to support active transport modes and not a large enough population base to support public transport services. Thornton Road has areas with high-crash rates that will be exasperated by growth in this corridor.
Fair	**W12 Manawahe – Rural residential**	Too far from main centres to support active transport modes and not a large enough population base to support public transport services. Some roads not well designed to cope with increased traffic (particularly heavy vehicles) and additional development may require a significant increase investment to maintain safety and reliability to an acceptable level of service.
Fair	**W13 Ōhiwa Harbour – Rural residential**	

Whakatāne and Peketahi bridges

Whakatāne Bridge – Transport and Utility Services

The Whakatāne Bridge serves as a vital transportation artery into the Whakatāne township, providing essential utilities such as water, telecommunications, gas, and power to residents and businesses. Despite its significance, the bridge has limited capacity for traffic, is susceptible to natural hazards, and lacks alternative routes for utility connections or transportation. These challenges are likely to impact the township's growth and quality of life over time. As the Eastern Bay continues to expand, so too will travel demands. Preliminary modelling predicts a 27%-36% increase in vehicle trips during the AM peak by 2048, resulting in increasing delays during peak periods.

While land use management and various interventions can somewhat alleviate the expected demand, these measures alone are insufficient to maintain acceptable service levels long-term. A major issue lies with the two primary roads connected to the bridge—Landing Road and Hinemoa Street—which experience congestion during busy times, thus impeding traffic flow. Expanding these roads is both costly and challenging and likely to create severance issues whilst transferring congestion problems elsewhere in the network.

Resiliency remains another concern. According to the state highway resilience framework, the Whakatāne bridge faces an "extreme disruption state" from tsunami hazards and a high seismic risk from earthquakes (events that are low frequency but have severe consequences). While these threats are significant, their infrequency means they might not manifest within many lifetimes. The bridge's vulnerability to flooding from the Whakatāne River, however, poses a more immediate risk, with potentially damaging events occurring once every 100 years or less. Similar bridges have been severely impacted by flooding in recent years.

Plans are underway to further investigate a solution to these constraints and risks. The Bay of Plenty Regional Land Transport Plan 2024-2034 identified investigation into an additional Whakatāne River crossing as the most important transport project in the Eastern Bay.

State Highway 2, Peketahi Bridge, Whakatāne

Peketahi Bridge, located on SH 2 between Awakeri and Tāneatua, is a vital freight link for Gisborne, Ōpōtiki, and Tauranga. This single-lane, signal-controlled bridge over the Whakatāne River is nearing the end of its lifespan. Deck replacement work was done in 2016/17, requiring a three-month closure that added 25 km to journeys and increased heavy traffic near Whakatāne schools, causing significant congestion. The bridge frequently closes for maintenance or accidents, always necessitating full route closures due to its single lane. These regular disruptions affect time-sensitive freight like kiwifruit, dairy, and aquaculture, and heighten road network vulnerability. As growth happens, particularly east of the Whakatāne River, these issues will worsen. Bridge replacement is expected in the next decade.

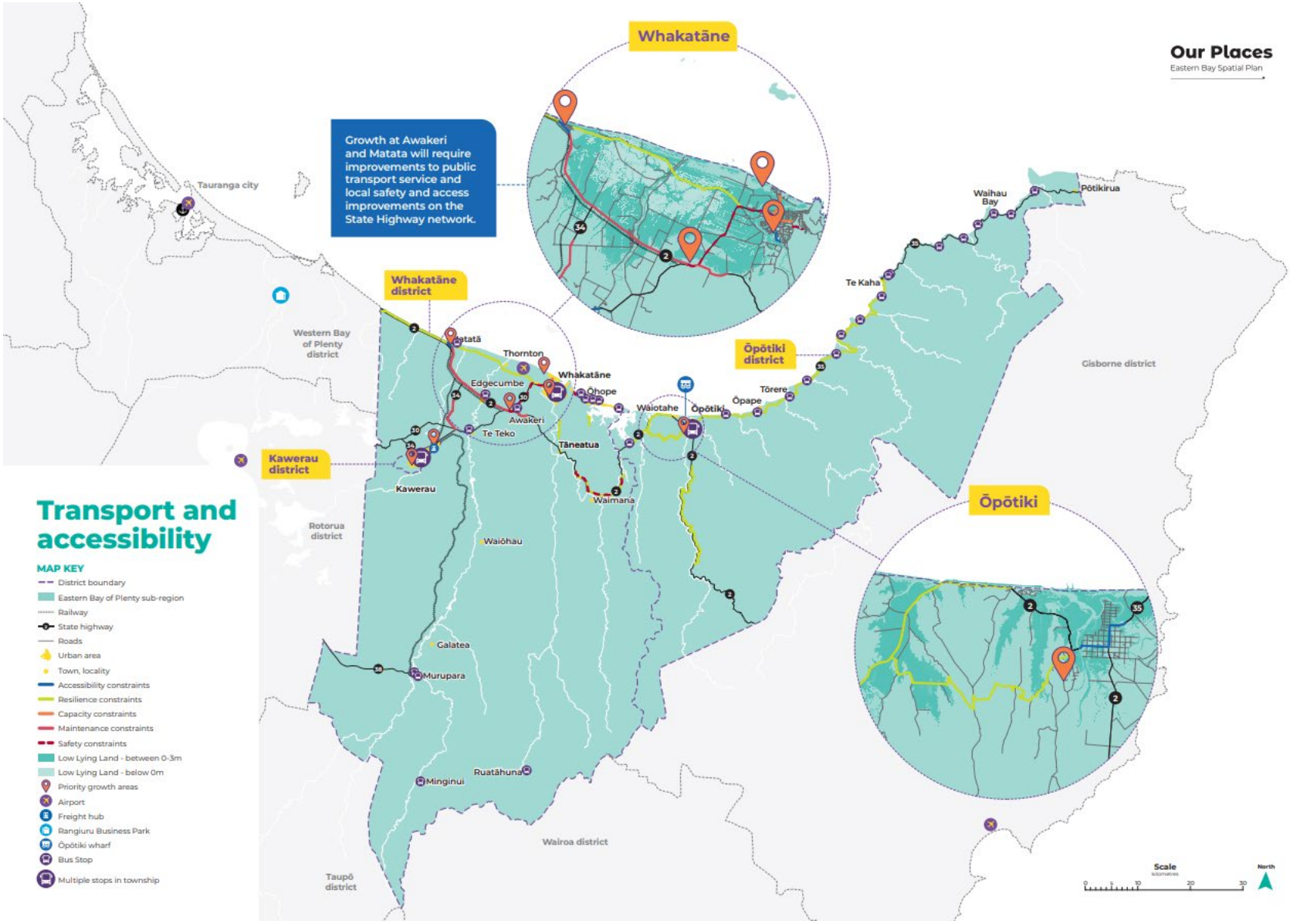

Figure 21: Transport and accessibility

9.6 Energy networks

The Eastern Bay has both large and varied industries that require a large amount of energy resource and electricity infrastructure, including manufacturing, commercial, forestry, horticulture and aquaculture. The region generates electricity energy through both hydro and geothermal resources.

National and regional priorities are developing and facilitating a more reliable security of electricity supply, reducing reliance on non-renewable energy, greater use and development of renewable energy sources, including small and community-scale electricity generation and using energy more efficiently and conservatively. The National Policy Statement (NPS) on renewable electricity generation recognises the national significance of renewable electricity generation and promotes the development, upgrade, maintenance and operation of new and existing generation, so by 2025, 90% of New Zealand's electricity will come from renewable sources.

The Eastern Bay is unique in the geothermal and hydro resource that are utilised for energy production. An important resource to the Eastern Bay is the Kawerau Geothermal System which forms part of the Taupō Volcanic Zone and extends over an area of approximately 35 km^2 across Kawerau and Whakatāne districts. The land over the Kawerau Geothermal System is used for urban, industrial and rural (mainly pastoral farming) purposes. Northeast of the Kawerau township is a large industrial area currently including the Norske Skog Tasman Mill and Oji Fibre Solutions (pulp and paper production), Asaleo (manufacture of personal hygiene products), and Sequal Lumber (timber drying), all of which are supplied geothermal energy to utilise the heat directly. Other surface land uses include the infrastructure associated with geothermal development, wells, pipelines and geothermal power stations.[17]

The transmission network in the Bay of Plenty consists of both high-capacity 220 kV and lower-capacity 110 kV circuits. Electricity generation is concentrated in the eastern part of the region, particularly around Kawerau, while demand is higher in the central areas, Whakatāne and Ōpōtiki. This results in a predominant east-to-west power flow, connecting major hydro and geothermal generation to the North Island's transmission backbone. With an increased demand in energy through a growing economy and population, the growth pattern for the spatial plan will consider the location and functional constraints associated with the development, operation and maintenance of electricity associated infrastructure.

[17] Kawerau Geothermal System Management Plan 2018.

The Bay of Plenty region and the wider New Zealand electricity generation transmission and distribution network is at risk from supply disruptions and energy shortages. This can impact on communities' ability to provide for their social, economic, and cultural wellbeing.[18] An example of networks at risk is the resiliency of the Edgecumbe sub-station. Transpower has identified that the Edgecumbe substation is a vulnerable asset due to its critical service to local power networks and its locational flood risk which requires essential resilience works.[19]

The Eastern Bay is currently serviced by Horizon Energy, which owns and operates the electricity distribution network, and Transpower, the state-owned enterprise responsible for New Zealand's high-voltage transmission network, known as the National Grid.

Horizons Energy Networks have provided a high-level response[20] to the feasibility of the residential, commercial/light industrial and industrial development connections via the Horizons network.[21] This response has been considered in table 13.

Table 13 Horizons Energy considerations

Rating	Location	Energy network comments
Unconstrained	**Minginui** **Murupara** **Tāneatua**	• The electricity networks are not constrained for residential land use at these locations. • Horizons expect an additional 0.6MVA to be available for connection of a commercial area at Tāneatua Road near Blue Rock quarry site.
Unconstrained	**Golf Links Road area (Whakatāne)**	• The networks supplying papakāinga (near the golf course) can supply 150 residential dwelling, and the feeder has the capacity to supply up to 1.9MvA, equivalent to 540 residential dwellings. • Further network upgrade is required to supply a scenario of 800 residential dwellings.
Upgrades required	**Ōpōtiki district**	• There is a voltage constraint on Horizons 11kV networks supplying the wider Ōpōtiki region during the peak load period in the current network configuration. • Horizon is undergoing upgrade works of the upstream assets to allow more capacity for the Ōpōtiki region via a new dual sub-transmission system expecting to be completed in 2027.
Upgrades required	**Hukutaia**	• Further upgrades of the 11kV will be required to support the load in the Hukutaia area

[18] Bay of Plenty Regional Policy Statement.
[19] Transpower article on substations requiring resilience work, March 2023.
[20] High-Level Response letter from Horizons Networks, 19 December 2024.
[21] Comments are preliminary and based on a desktop-only study.

Upgrades required	**Matatā**	• The current electricity network supplying Matatā is constrained during peak periods. • Horizon has plans to develop a new 33/11kV substation at Manawahe to improve voltage performance and allow more capacity in the Manawahe region in the later part of the Horizons 10-year plan. • The new substation would need to be brought forward should there be growth in Matatā in the next 10 years.
Upgrades required	**Awakeri**	• The current 11kV feeder supplying the sites in Awakeri can only support an additional load of 3.6 MVA. • Growth in Awakeri will require an upgrade of Horizon's Awakeri 11kV feeder.
Constrained	**Te Teko**	• Horizon's current electricity networks supplying Te Teko is at its capacity with minimal headroom available.

10 Medium List Summary Evaluation

This section outlines the results of the summary analysis for each of the identified medium list residential development options. A series of workshops were held with Council technical staff to qualitatively assess the likely performance of each development option, considering the infrastructure information currently available.

Table 14 Development option assessment categories

Suitable for further investigation and planning (or already in development) and no apparent major constraints	
Suitable for further investigations and planning, subject to site conditions that could affect feasibility	
Poor performance likely due to strategic factors, do not consider further	
Critical issue exists, do not consider further	

Table 15 Evaluation of Medium List Development Options

Option Area	Summary Outcome	Reason for rating
Kawerau District		
K1 Roy Stoneham Park	**Under development**	Roy Stoneham Park development (104 lot subdivision) will proceed over next five years by Kawerau District Council. This development is already underway with a plan change completed.
K2 Hardie / Beattie Ave area		Area is already zoned Residential and may be developed subject to funding requirements being met. There are some known stormwater ponding issues that require resolution and is dependent on landowner (Ngāti Tūwharetoa), and availability of public funding.

Option Area	Summary Outcome	Reason for rating
K3 Valley Road		Greenfield area with existing residential and rural lifestyle zoning. However, land remains undeveloped due to many constraints, including topographical challenges and many archaeological sites that may be sensitive to change.
K4 Kawerau town infill		There is interest in developing smaller sections and infill housing in Kawerau, however, infill development will be dependent on individual landowners and market demand. There is infrastructure capacity in existing three waters systems to accommodate infill.
K5 Western rural area		Rural residential development would not provide bulk development capacity or contribute to staged development needs. Existing rural activities would likely contribute to reverse sensitivity effects with residential development. The western rural area is iwi-owned land that is being farmed – there are no plans for rural residential development.
Ōpōtiki District		
O1 Hukutaia		Hukutaia has sufficient capacity in the long term. A plan change to rezone the area is underway to open the area for development. Infrastructure investment through private or public funding will allow development to progress.
O2 Waiōtahe/ The Drifts		Waiōtahe has limited capacity in the long term but can meet some of the short-term housing demand. Development is subject to market drivers and landowner willingness to develop. Affordability of infrastructure to service housing is considered less viable compared to other rural areas.
O3 Tablelands – urban density		Tablelands is not a viable option for greenfield development due to distance from the Ōpōtiki township. The area also has highly productive horticulture land with Class 2 soils which are to be protected from inappropriate subdivision, use and development.
O4 Paerata Ridge – urban		Paerata Ridge is not a viable option for greenfield development due to topographical constraints and natural hazard risk (landslips). The area also has highly productive horticulture land with Land Use Class 2 soils which are to be protected from inappropriate subdivision, use and development.
O5 Ōpōtiki town infill		Ōpōtiki township has space for infill development, however, due to natural hazard risks, (flooding) development is constrained and managed through the district plan on a case-by-case basis. Limited capability for intensive growth within the township and not suitable for large scale intensification and infill.

Option Area	Summary Outcome	Reason for rating
O3 Tablelands – rural residential		Tablelands is not a viable option for greenfield development due to distance from the Ōpōtiki township. The area also has highly productive horticulture land with Class 2 soils which are to be protected from inappropriate subdivision, use and development. There are many HAIL sites in this area.
O4 Paerata Ridge – rural residential		Paerata Ridge is not a viable option for rural residential development due to topographical constraints and natural hazard risk (landslips). Rural residential growth does not support active modes of transport and may require upgrades to the rural transport network increase operating costs. The area has highly productive horticulture land with Land Use Classification 2 soils which are to be protected from inappropriate subdivision, use and development. Due to development constraints, it is only an option for supplementary rural residential growth (e.g., low yield) to provide housing location choice.
O6 Ōhiwa - rural residential		There is limited capacity for rural residential growth in Ōhiwa which could occur on the eastern side of the ridge. However, the population density required to support local services would be too low thereby increasing vehicle traffic on SH 2. Growth here could lead to upgrades to the rural transport network and increasing overall operating costs.
Whakatāne District		
W1 Awakeri – new urban		Concentrated growth in a single location midway point between Whakatāne and Kawerau supports greater range of local services and reduces travel. It also makes the provision of active modes and public transport more viable. Over the long term, a new large scale development area in the Whakatāne district can increase the district's overall resiliency by reducing reliance on Whakatāne township as the main development focus area. Due to a lack of existing infrastructure, the challenge will be to funding and ensuring staging of development and provision of infrastructure at the right time and affordably.
W2 Te Teko – new urban		The Te Teko location relies on engineered flood mitigations which would expose large scale development to residual risk from overdesign events. Concentrated growth in a single location close to Kawerau supports greater range of local services and reduces travel. It also makes the provision of active modes and public transport more viable. Due to a lack of existing infrastructure, the challenge will be to ensure the staging of development and provision of infrastructure must be managed well so development does not significantly lag. Existing social issues may also preclude development interest.

Option Area	Summary Outcome	Reason for rating
W3 Matatā – new urban (east of village)		Matatā has good connections to the Western Bay of Plenty, Kawerau and Whakatāne. There are no Highly Productive Land constraints. A process is already underway to provide wastewater infrastructure. Some land is owned by Māori land trusts which could provide for an opportunity but requires additional discussions.
W7 Whakatāne town infill (excluding Kopeopeo)		Low lying land between Landing/Domain Roads and river cannot be developed due to flood risk and other areas of the township are affected by residual risk. The district plan has been enabling but the market to date has not delivered medium/high density development.
W8 Whakatāne town (Kopeopeo) infill		This area in Whakatāne township is not encumbered by the same flood risk as the rest of the community. There is capacity to intensify and deliver additional dwellings in Kopeopeo, and this is a more affordable infrastructure option. The current district plan settings are enabling; however, development is subject to landowner interest and could not meet the total projected demand.
W9 Matatā infill		Matatā has good connections to Western Bay, Kawerau and Whakatāne. There are many large sections that can be intensified and there is no flooding risk. There is a process already underway to provide wastewater infrastructure to support infill and further development (east). The infill would avoid known natural hazards.
W10 Ōhope Beach infill		Ōhope is a high demand residential location due to the environmental amenity of the coastal area. There are substantial constraints from flood hazards and coastal inundation that preclude much development taking place. Appropriate natural hazard protocols need to be applied, and the coastal erosion and inundation data is being updated currently. Where appropriate, additional densities should be enabled for infill and intensification purposes. Natural hazard mapping is under review, and there is unlikely to be substantial capacity to infill or intensify in this area. No estimate of household yield is made due to uncertainty of natural hazards.
W11 Thornton dunes rural residential		Roading network will need to be upgraded, and new three waters infrastructure will be required. Attractive location close to Whakatāne. Some Māori owned land on dunes which has potential to become papakāinga.
W12 Manawahe rural residential		Manawahe is located some distance from the urban areas. Roading upgrades will be needed. Development scale will be limited due to highly productive land constraints. All new dwellings will need to be self-sufficient in terms of Three Waters.

Option Area	Summary Outcome	Reason for rating
W13 Ōhiwa Harbour rural residential		Some distance from urban areas. Roading upgrades will be needed. Development potential is limited due to overlays and constraints currently in place to protect an environment of significance.
W6 Murupara		There is potential for a small amount of infill development, and for greenfield development to the south of the village, to accommodate the aspiration for 300 dwellings at Murupara. Upgrades to water and wastewater infrastructure would be required to accommodate this.
W4 Tāneatua		There is potential for some growth at Tāneatua. Water and wastewater infrastructure would need to be upgraded to accommodate growth. Further consideration of river flooding is required before determining the appropriate level of development in this area. Fluvial river flooding considerations limit stormwater management options and some flood management work may be required. While initially considered suitable for shortlisting, further information on natural hazards renders Tāneatua unsuitable. A risk assessment may inform future decisions on development in this location.
W5 Minginui		There are large sections and there is capacity for infill or expansion of the village. Council has no Three Waters infrastructure in the township currently.

11 Step 3: Short List Development Options

Based on the assessment of supply and demand in this report, in all time periods projected demand for residential land is projected to exceed planned supply across the sub-region. There is a need for additional commercial business land, and to rezone land to provide for additional industrial supply around Ōpōtiki township and east along the coast. New greenfield development areas are necessary to meet the scale of projected demand and provide certainty of supply over time. Where this can happen is constrained by natural hazards, land ownership and existing uses. Infill, papakāinga, and rural residential developments will contribute to supply, but the quantum and timing are currently unknown. Papakāinga development and Māori-led housing could be a much larger proportion of the housing mix in the coming decades, and the scale of its successful delivery could affect timing of demand for conventional housing.

Based on the evaluation of the medium list development options, a short list of development options was developed (Figure 22). These options were assessed as being suitable for additional residential growth with ongoing avoidance and management of natural hazards.[22] There are infrastructure and funding requirements associated with all development options.

[22] Note, whilst Tāneatua is indicated on the shortlist map it was subsequently ruled out for flood risk reasons.

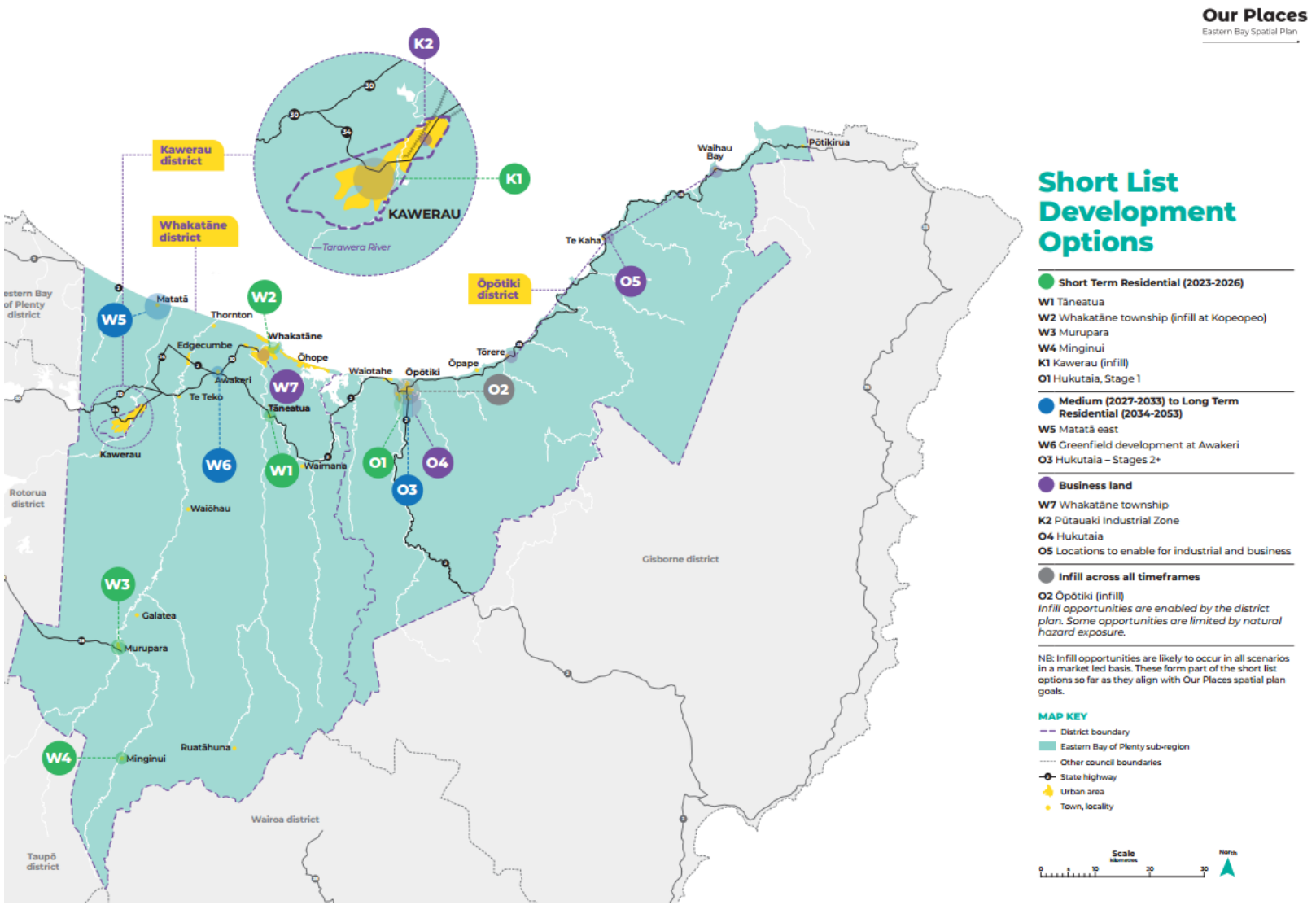

Figure 22: Short list development options

12 Step 4: Spatial Scenario Analysis

The next step in the process involved a high-level spatial scenario analysis which explored and evaluated different land use options and assessed their implications for various aspects of urban sustainability, such as environmental quality, infrastructure, and economic development.

Three high-level strategic scenarios were created to support discussions on how we could accommodate current and future housing and business needs. By exploring different pathways, scenario analysis can help the community, stakeholders and decision-makers understand the potential consequences of choices.

The evaluation included comparing the strengths and weaknesses of each scenario and determining which ones are most aligned with the spatial plan goals. It also included evaluating the tradeoffs of different growth patterns and measuring the potential implications of long-term growth on infrastructure provision, the environment, cultural and social values to help guide decision making around a preferred future spatial development pattern and a development strategy required to achieve that spatial form.

The three strategic scenarios were developed based on several assumptions including:

- All scenarios have a single, consistent evaluation year (2053), equivalent to 30 years forecast growth.
- All scenarios use a consistent analysis of environmental characteristics and constraints.
- All scenarios assume infill development within townships is not seen as a large-scale source of housing supply. This is because some townships are affected by the residual risks posed by river systems, climate change and/or natural hazards and, overall, there is not likely to be enough space to fit in all the houses we would need, although, Kawerau is the exception as it is not constrained broadly by natural hazards related to flooding. While there has been some infill over time and this is expected to continue, it is unlikely to be at a scale to meet demand.
- All scenarios assume the enablement of Papakāinga and other housing developments on Māori land to enable whānau to live and work, and be connected to their whenua, resources and tikanga. It has potential to become a much larger overall component of the Eastern Bay's housing supply.

- Some communities are planned to grow in all scenarios because these aspirations have been clearly expressed by project partners and some are already in various stages of planning.
    - Kawerau: Stoneham Park Residential Development
    - Ōpōtiki: Hukutaia Growth Area will happen. It has been consulted on before and planning is well underway.
    - Whakatāne:
        - Plan Change 8: Making Room to Grow (Huna Road:175-plus dwellings) may be approved for development.
        - Minginui: Assumed to grow by around 50 plus dwellings.
        - Murupara: Assumed to grow by around 300 plus dwellings.
        - Matatā: A minimum of 100 plus new dwellings enabled, but this could be much more if a larger wastewater treatment service can be provided

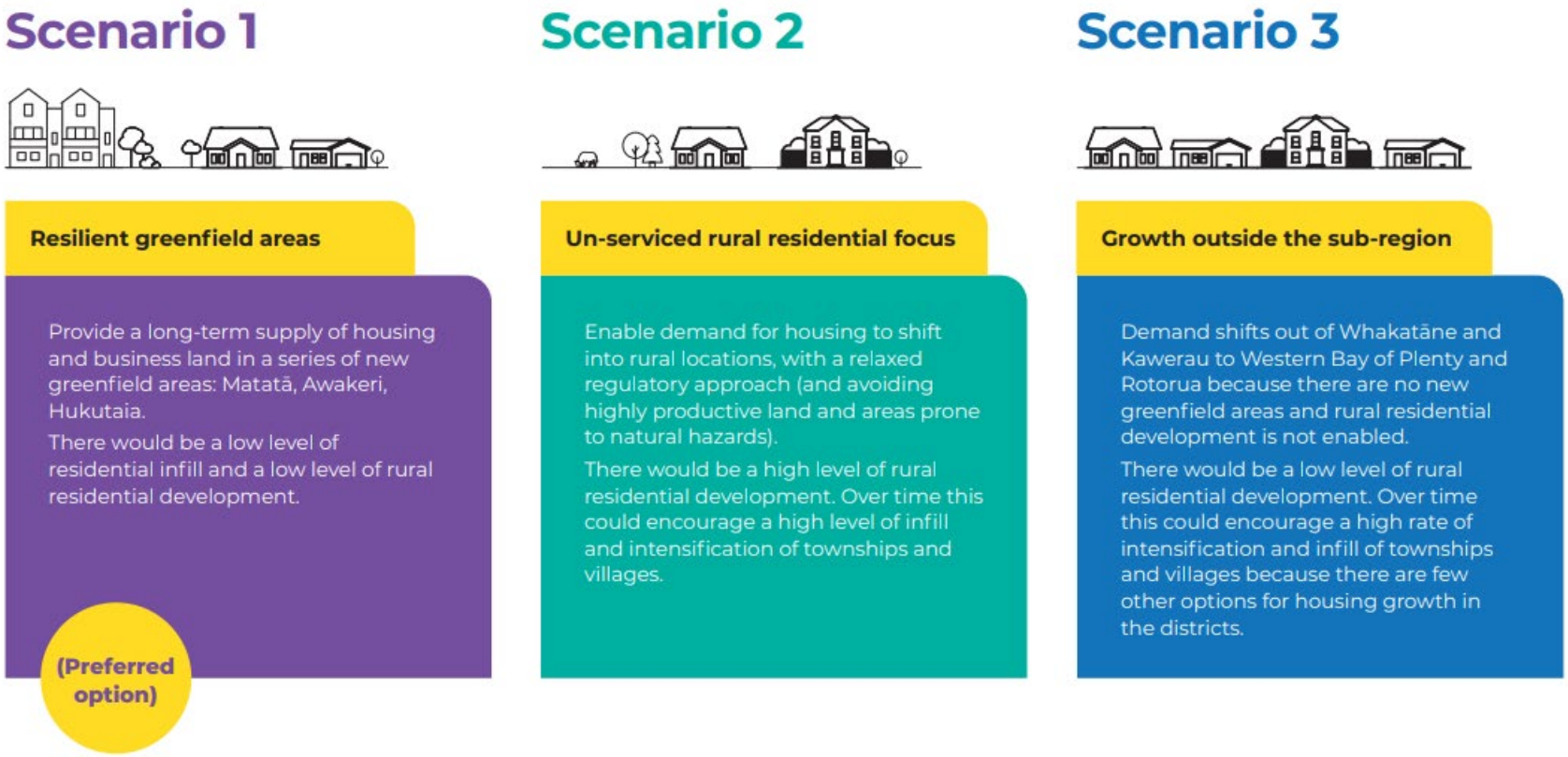

Figure 23: Strategic scenarios for future growth

12.1 How the scenarios perform against the Spatial Plan goals

To arrive at a preferred scenario, each scenario was evaluated against the spatial plan goals. This assessment shows that Scenario 1 could perform the strongest. Each scenario will have different costs and benefits in the short and long term and all scenarios come with trade-offs and a need for careful and well-considered implementation to avoid, mitigate and remedy possible effects.

On balance of factors, Scenario 1 is considered to have the best alignment with the goals. This is because new urban development areas can be designed to high environmental standards, meeting housing needs locally will support economic development, and Councils can require provision of diverse housing supply to better meet demographic needs in the sub-region. Scenario 2 is likely to erode the rural economic sector over time due to reverse sensitivity, and Scenario 3 would constrain economic development opportunities in the sub-region.

Table 16 Performance of strategic scenarios against Outcomes Framework Goals

Goals we want to achieve	Scenario 1. Resilient greenfield areas [preferred scenario]	Scenario 2. Unserviced rural residential focus	Scenario 3. Growth outside the district
Healthy and healing	Greenfield areas offer the opportunity to design from the ground up. A compact, high-quality design can lead to good environmental performance and improve resilience to climate change and natural hazards.	Environmental impacts from spread out development pattern mean this option would perform worse than Scenario 1.	Less development and less environmental means this option could perform better in the Eastern Bay but would shift impacts into other locations.
Sustainable, diversified economy providing jobs and purpose for our people	Housing needs can be met locally, and this can support economic / employment growth in the Eastern Bay. Greenfield urban development can avoid and manage conflicts between land uses.	Reverse sensitivity impacts from rural residential uses that are broadly spread through the sub-region can erode rurally based economic activities that are a critical part of the Eastern Bay's economy.	Not providing housing locally would constrain economic growth over the long term and not lead to improved economic opportunities as housing remains a constraining factor.

Goals we want to achieve	Scenario 1. Resilient greenfield areas [preferred scenario]	Scenario 2. Unserviced rural residential focus	Scenario 3. Growth outside the district
Connected, thriving, resilient people, communities and places that reflect our history and aspirations	Scenario 1 is the most likely to meet housing needs locally in the Eastern Bay and offers housing choices that better meet demographic needs and offer more affordable options. Councils can directly influence housing supply outcomes in this scenario. Expanding smaller villages would change their sense of place and character.	New development would spread into the rural areas meaning that community facilities become harder to provide (less efficient). There could be broad scale visual impacts on the rural landscape, and housing types would not meet demographic housing needs or provide more affordable choices.	Housing would become increasingly harder to come by so people would need to move outside of the sub-region because there is no choice. Communities could be less thriving or socially well-connected over time.

12.2 Main infrastructure implications of scenarios

In all circumstances, enabling new development requires infrastructure investment. The three scenarios have been broadly evaluated considering three water systems, transport, community facilities, and constraints of climate change and natural hazards.

Table 17 Infrastructure implications for strategic scenarios

Scenario 1 **Resilient greenfield areas** **(Preferred scenario)**	• New greenfield areas would require investment into three waters services, resilience measures (including flood management planning), transportation network changes and community facilities from councils, developers, rate payers, and builders. • There is already infrastructure planning underway in Matatā for a new wastewater treatment plant and to enable Hukutaia. This makes Matatā a quicker opportunity than a completely new development area around Awakeri which could take longer. • The scale of development at Matatā will be limited by the feasible design of the planned wastewater treatment plant and the extent of natural hazards. If a large scale treated effluent disposal field is not secured for the Matatā wastewater treatment plant, then this could limit expansion to around 100-250 new dwelling units. The implication would be that the Awakeri greenfield area would need to be planned to be much larger and need to be done sooner.

Scenario 2 or 3 **Substantial infill and intensification of Whakatāne or Ōpōtiki townships (Scenario 2 or 3)**	• In scenario 2 and 3, infill and intensification of the townships would take place to the extent natural hazards would permit. Kawerau district has sufficient three waters network capacity to accommodate projected population growth, but Whakatāne or Ōpōtiki townships could eventually need to upgrade three waters networks depending on the degree of changes. • Transport network changes would be required to support intensification of these townships, particularly in Whakatāne, which could require investment into urban road improvements and for active modes. • Because infill in Whakatāne or Ōpōtiki townships possibly raises exposure to natural hazard risk, there could be added mitigations and costs needed to manage risks to existing communities beyond those already required.
Scenario 2 **Unserviced rural residential**	• Transport network level of services would become more costly as more households rely on the smaller rural roads, and public transport services would become less feasible to deliver cost effectively. • While the scenario would mean less costs for local councils to provide three waters services, costs for on-site water and wastewater systems are placed on builders/homeowners instead of onto councils. • With increased reliance on tanked water for rural residential dwellings, this may increase exposure to climate change risks.

13 Step 5: Development of a new future scenario

The scenario planning process developed the three growth scenarios to be contrasting and to explore different ways of meeting demand for development. Community engagement was undertaken during October–November 2024, asking Eastern Bay communities for feedback on the three scenarios and generally about housing and business growth in the Eastern Bay over the next 30 years. A total of 38 responses were received specifically on the scenarios. The feedback included diverse perspectives, emphasising the need to consider the effects of climate change, balanced development, improved infrastructure and environmental sustainability. New land areas were also requested by submitters for consideration.

The Spatial Plan Engagement Summary Report provides a summary of the feedback received and the spatial plan response. This report is included as Appendix 3.

The community engagement feedback, along with additional natural hazard information, informed the reassessment of the shortlisted development options and the development of an updated set of assessment principles. The updated principles, the reassessed short list development options and the new land areas requested by submitters were included in a Multi Criteria Analysis as part of the on-going assessment process to develop a new scenario.

13.1 Additional natural hazards information

Climate change mitigation and adaptation is an increasing focus for many territorial authorities. Whakatāne District Council is progressing a district climate change risk assessment, while other flood asset-led catchment management processes (e.g., Bay of Plenty Regional Council River Scheme Sustainability Project) are underway for vulnerable communities, including Edgecumbe and Ōpōtiki areas. Iwi and hapu are also turning their minds to local adaptation and iwi spatial planning processes to consider community-led responses to a changing climate.

Workshops with Council partners on climate resilience and flooding, with the benefit of further information, suggested that reconsideration of some locations for growth may be appropriate. As it relates to the short list development options and the three strategic scenarios, the key focus areas are the townships of Ōpōtiki, Whakatāne, Kawerau and future growth areas in Tāneatua, Awakeri, Matatā and Hukutaia. The outcomes of the workshops are summarised in Table 18.

Table 18 Locations with updated natural hazard considerations

Location	Comments and recommendations
Ōpōtiki township	A question remains on the appropriate basis for determining whether infill areas can accommodate future growth, which is currently enabled and managed through the district plan. Ōpōtiki District Council has opted to undertake a natural hazard risk assessment before determining the appropriate level of growth in the township.
Whakatāne township	There is opportunity for limited infill in Kopeopeo (and similarly elevated areas) within the Whakatāne township. There is an existing flood risk in the remainer of the township as highlighted by draft evacuation planning mapping. A precautionary approach to development is recommended that avoids enabling large-scale growth that is not already enabled by the district plan and promotes that a natural hazard risk assessment should be undertaken to inform future planning initiatives including resilience planning.
Kawerau	Kawerau would benefit from stormwater flood modelling to identify floodable areas which can be used to inform locations for future infill opportunities.
Tāneatua	There is an identified flood risk in Tāneatua. A precautionary approach to development is recommended to avoid any large-scale growth that is not already enabled by the district plan and that a natural hazard risk assessment should be undertaken to inform any future planning initiatives including resilience planning.

Location	Comments and recommendations
Awakeri	There are constraints to stormwater for new development in Awakeri in the immediate area and in the downstream environment. The flood and drainage scheme will need to provide an agreed level of service that will need to be affordable for the community in the long term. Stormwater management needs to be included through master planning processes for urban growth in Awakeri.
Matatā	Stormwater management needs to be included through master planning processes for urban growth in Matatā.
Hukutaia	Stormwater management needs to be is included through master planning processes for urban growth in Hukutaia.

13.2 Updated assessment principles

Following community engagement, the decision-making assessment principles (Section 8.1 and Section 9.1) were updated to help make decisions on the engagement feedback and technical work, and to inform the development of the Spatial Plan and its implementation plan. These updated principles are a compilation of existing principles used throughout the scenarios and development options process to assess development suitability and additional principles to address gaps identified by the engagement feedback received. They were approved by the Project Governance Group.

The updated principles are listed below:

1. First, consider locations where there are existing settlements and infrastructure before contemplating new growth areas and infrastructure.
2. Avoid locations where natural hazard risk (including residual risk) and effects of climate change cannot be practicably and equitably managed.
3. Urban development should have good connections or access to employment, services and schools, and have affordable community infrastructure to support community wellbeing.
4. Avoid and mitigate impacts on natural areas to protect and conserve.
5. Protect culturally significant areas from development.
6. Minimise urban development on Highly Productive Land and ensure no rural residential development on Highly Productive Land (excluding papakāinga).
7. Enable and support iwi/hapu to use their land for their aspirations and unlock opportunities.
8. Cost of infrastructure is feasible and affordable.

9 Enable a certainty of zoned and serviced land supply for residential and business purposes for a thirty-year period.

10 Locations that enable residential development and economic development opportunities are preferred.

11 Consider the changing needs of housing types due to shifts in demographics.

12 A settlement pattern that supports achievement of net zero gas emissions by 2050.

13 Community wellbeing outcomes can be supported by great placemaking.

14 Protection of existing land uses from reverse sensitivity effects.

15 Providing for an appropriate scale and design of urban developments for growth locations.

16 Integrating urban services (three-waters and transport) with funding and the sequence of land release for development.

17 Existing infrastructure upgrades to support community resiliency and future growth.

18 Incorporating Māori design principles into urban growth areas and neighbourhood regeneration projects.

19 Incorporating adaptive and environmentally sustainable development practices into growth areas.

13.3 List of development options to be reconsidered in creating a new scenario

The shortlisted development options and new land areas requested as part of the community engagement feedback have been reviewed. Refer to Table 14 for the development option assessment categories.

Table 19 Development options reconsidered post engagement

Development options	Reassessment following community engagement
Matatā	Review the scale of development suitability, considering that 1,500 additional homes were not supported in engagement feedback. Review affordability of delivering infrastructure, particularly the planned wastewater treatment plant, and resultant feasibility of development. These are interlinked with the scale of development.
Awakeri	The timing of development could be sooner and the scale larger than initially thought, considering a smaller scale of development in Matatā. It will be important that the physical location of the flood scheme and flood risk limitations are considered at the early planning stages to ensure that regionally important infrastructure (like the flood scheme) is protected and affordable, and flood risk to the community is not increased.
Whakatāne township (excluding Kopeopeo)	The potential for intensification is limited by flood risk and other natural hazard constraints and intensification (e.g., new houses in existing areas) has not been delivered at scale by the market to date and is not expected to be delivered at scale in the short to medium term. Evacuation mapping indicates that many parts of Whakatāne (with exception of Kopeopeo and some other elevated locations) could be affected by a breach of the stopbank, indicating that more housing at these locations is not a good idea.
Ōpōtiki township	Further investigation has highlighted issues relating to existing flood risk, as well as residual risk that has the potential to pose risks to the safety of the community and affect the suitability of additional intensification or infill development.
Tāneatua	Further information about flood hazards has identified the need for a precautionary approach to enabling greenfield development in this location until natural hazard risks are assessed and risk management decisions are made.
Edgecumbe	The natural hazard risk means additional development is not appropriate in the Edgecumbe township.
Rural residential areas	Consider identifying locations to avoid, due to highly productive land and reverse sensitivity effects and consider areas that may be promoted for this type of development.
Hukutaia	Greenfield development - retained without changes.

Development options	Reassessment following community engagement
Kawerau	Infill or intensification - retained without changes.
Whakatāne township -Kopeopeo	Infill or intensification – retained without changes.
Putauaki – industrial and business	Additional industrial/business land retained without change.
Whakatāne town – commercial	Commercial development - retained without change.
Ōpōtiki and East Coast locations for iwi commercial aspirations	Retained without change.
Iwi aspirations for housing development	Continue to work with Iwi partners to clarify their aspirations and incorporate these into the plan. Ensure support for papakāinga to be enabled on Māori land.
Iwi led housing in Minginui and Murupara	Retained without change.

13.4 New land areas proposed through community engagement

Table 20 New land areas considered as development options

Location	Description
Whenua Māori West of Coastlands	Located between Coastlands, Whakatāne golf course and the Whakatāne Airport. Approximately 188 ha across four land parcels – Māori freehold land and freehold title.
Keepa Road, Whakatāne	Investigate potential for housing development. Currently rural zone. No land parcel identified. General area adjacent to the road.
Māori freehold land to east of the Charter Club Ōhope	Investigate potential for housing development. Land adjacent to 270 Pohutukawa Road and 58 Wainui Road Ōhope.
Māori freehold land on Ngāti Awa Farm	Investigate potential for housing development.
Maraetotara Valley in Ōhope	Investigate potential for housing development. No land parcel identified. General area adjacent to the road.
Baird Road and River Flats, Ōpōtiki	Land proposed for industrial and commercial use near the western side of Ōpōtiki township.

20 Dunlop Road in Ōpōtiki (mixed use development)	Land proposed for mixed use development.
Evans Park, Murupara (Ngāti Manawa)	Land area proposed for iwi-led housing development projects and Papakāinga.
Minginui and Te Whaiti	Involvement with Te Rūnanga o Ngāti Whare in aspirations for growth in Minginui.
Rangitaiki Parish 31P 3F, Awakeri	406 White Pine Bush Road. Hapū members seek to understand the feasibility of developing Māori housing as part of the proposed growth area in Awakeri.
Paroa Road area (West of Whakatāne township)	Hapū members seek rezoning to allow Ngāi Te Rangihouhiri II and Ngāti Hikakino whānau and lands trusts to develop whenua in Te Paroa.
Thornton Dunes	Located close to Whakatāne. Some Māori owned land on dunes which has potential to become papakāinga.

13.5 Multi Criteria Analysis

From the feedback received through community engagement, Scenario 1 was generally considered to be the most appropriate option. This scenario was used as the 'base' for the development of a new scenario that would inform the spatial plan. To assess the shortlist development options (table 18) and the new land areas proposed for investigation (table 19) a Multi-Criteria Analysis (MCA) was undertaken. The MCA informs decision making but should not be used solely to provide definitive answers about the best alternative or option (that is, MCA is a tool that supports decision making, but it does not make decisions).

The MCA is included in Appendix 5. The updated assessment principles (section 12.2) have informed the range of measures and evaluation criteria used in the MCA. The evaluation was informed by a range of information, data, and analysis, including:

- Analysis of development capacity (including indicative feasibility)
- Analysis of environmental and land-use constraints
- Analysis of the available capacity of three waters infrastructure, social infrastructure
- Analysis of accessibility to employment, education, services, and transport networks

The scoring of the development options in the MCA reflects the initial assessment made against each evaluation criteria. Even though the ranking of one option may be high based on its performance across all the criteria, it does not necessarily

mean that the option is preferred over others because it may have scored low on other specific assessment criteria that is considered more important i.e., natural hazards considerations.

14 New Scenario for the Spatial Plan

The engagement feedback on the three strategic scenarios in addition to natural hazard information, updated assessment principles, and an MCA of the refined short list development options and proposed new areas for investigation, have all helped to inform the development of a new scenario. The new scenario is an important input to the Spatial Plan because it communicates the growth plan. Where there are discrepancies between this report and the spatial plan, the spatial plan information will be considered the most up to date and correct.

As with all forward-looking statements, there is a great degree of uncertainty, especially from dynamic influences, like immigration rates or macro-economic trends. Where unit yields are indicated in the scenario, these are subject to additional feasibility investigations and are likely to change. They may also change as the draft Spatial Plan is prepared, as additional analysis is conducted in relation to the latest population statistics.

14.1 Central Urban Corridor

Most urban growth and economic activity are expected to take place in the central urban corridor (see Figure 24). These places are highly interconnected for schooling, employment, and residential activities.

Table 21 Development locations for the preferred new scenario

Place	By 2055…	Critical pre-requisites
Awakeri	By 2055… Awakeri develops into a small town with commercial services catering mainly to local needs and employment. More than 2,000 dwelling units have been developed with a mix of stand-alone and multi-unit types. Beyond 2055, Awakeri could continue to expand and become a new town in the Eastern Bay. New parks and open spaces have been established through a master planning approach to development that integrates with local stormwater management facilities. The school has grown to meet roll requirements, and there are good bus options to other schools in the district. Connections to Whakatāne township, Kawerau and other local employment opportunities are provided by road and public transport. The	• Development feasibility • Integrated catchment management plan and development masterplan • Structure plan and District Plan change • Secured funding • State highway access improvements • Water supply and wastewater services

Place	By 2055…	Critical pre-requisites
	intersection of SH 2 and SH 30 places Awakeri at the centre of many places. Ngāi Te Rangihouhiri II and Ngāti Hikakino supported the interest of hapū members who are part of the Kiwinui Trust, in developing Māori housing on Rangitaiki Parish 31P 3F in context of Awakeri in the vicinity of the town. Ngāti Awa Group Holdings has also supported growth in Awakeri and noted that they will be willing to support Ngāti Awa Land Trusts interested in development.	
Whenua Māori West of Coastlands	By 2055… this area could remain in its current state or be developed into a multitude of options from commercial and educational opportunities to residential leasehold and papakāinga developments. At nearly 190 ha, the area represents a strategic opportunity for housing and socio-economic activities. A vision for these future uses would need to be led by iwi and hapū to promote a change from the current undeveloped state. For example, at a lower residential density, the site could possibly accommodate 600 houses as well as social or commercial uses (depending on site conditions and many other factors). As another example, with an urban density and fully reticulated water services, it could possibly support two to three times this number of houses. While a higher housing yield could possibly be achieved, the lower density recognises that the land tenure is Māori freehold land, and a leasehold based development model (which is likely on this land tenure) would limit the interest of the broader market.	• The Māori freehold land belongs to members of Ngāi Taiwhakaea hapū who would require strict environmental controls and would oppose anything which may cause further adverse effects to their whenua, awa and moana. It is likely that where development "potentially" occurs on Māori freehold land led by Land Trusts it will be opposed by Ngāi Taiwhakaea hapū. • The first step must include creating a hapū approved approach to development, development feasibility investigation, site specific natural hazards risks and mitigations assessment (e.g. tsunami). • A masterplan by Land Trusts and hapū would need to be undertaken to inform a district plan change and structure plan to enable development of this area, and to confirm the intended development proposal, infrastructure approach, and the related funding proposal. • There would be specific planning and infrastructure pre-conditions, and funding requirements, identified through the masterplan.

Place	By 2055…	Critical pre-requisites
		• The district plan could apply a Future Urban Zone.
Matatā	By 2055…. Matatā has experienced some growth. Development occurs within the areas of the community presently zoned residential. Growth has been slow and steady. Matatā's future will be influenced by population growth driven by nearby employment hubs. Increased activity in the Putauaki Industrial Area in Kawerau, business development at Rangiuru (east of Papamoa), and continued growth within Whakatāne township are expected to create new employment opportunities within a reasonable commuting distance. This will likely attract new residents to Matatā, reinforcing the need for a coordinated and sustainable approach to township development. The residential zone in the Operative District Plan for Matatā is larger than the current developed urban footprint. Subject to the development of a reticulated wastewater system, the town is anticipated to grow from approximately 260 homes in 2025 to 600-700 homes. This is expected to happen through a mixture of infill, subdivision of existing residential properties, and new development on residentially zoned land east of Pollen Street. This will occur over the long term of 10-30 years. Additional to the existing capacity provided for in the Operative District Plan, there is elevated land suitable for future new growth further east of the existing residential zone. This area could accommodate another 700-800 homes and should be preserved for future urban development consideration by avoiding low density residential uses. Ngāti Rangitihi and Ngāi Te Rangihouhiri II have a strong desire for Papakāinga development. Ngāti Rangihouhiri also has an interest in developing a cultural base on their land blocks in the East of Matatā.	• Currently, Matatā is on septic tanks and growth depends on the ability to treat and dispose of wastewater. A stand-alone wastewater treatment plant with land-based disposal is required to enable new housing. The wastewater treatment plant is not a fully funded activity. • A structure plan should be undertaken for the vacant areas of existing residential zoned land east of Pollen Street, once a wastewater treatment plant receives a resource consent. • At the same time as the structure plan, address changes in character and additional infrastructure requirements, by conducting a levels of service review for the community to address impacts on existing infrastructure and facilities from planned development. • The district plan will need to recognise a Future Urban Zone that encompasses land beyond the existing residential zoned areas east of Pollen Street. Before this area could be developed, it should first require the existing residential zoned capacity to be taken up within the community and additional wastewater treatment plant capacity to be funded, followed by a masterplan led by both iwi and Council. • As part of the structure plan and ahead of any zoning change, a site-specific natural hazards risks and mitigations assessment (e.g., tsunami) should be carried out. • Understanding the work proposed to be undertaken to re-channel Te Awa o Te Atua

Place	By 2055…	Critical pre-requisites
		and the impact that may have on the current town layout is a critical component of future planning for the community.
Kawerau: residential infill and Putauaki Industrial area	By 2055… residential infill/intensification in Kawerau has been driven by market demand supported by the ongoing growth of employment within the community, especially with the expansion of Putauaki Industrial area. Kawerau district has limited opportunities for greenfield residential development. Increasing housing in the district will require infill or intensification of the existing residential areas. There are also blocks of Māori-owned land in the residential area that provide opportunities for papakāinga and Māori-led housing options. The Putauaki Industrial area has been successfully developed as a green industry and geothermal and bio energy hub. Kawerau is regarded as the pre-eminent industrial activity area in the sub-region.	• District-wide stormwater flood modelling to inform review of the district plan, and inclusion of flooding provisions to address the potential for infill / intensification in Kawerau.[1] • Feasibility for infill development should be improved through the pending district plan review process.
Ōpōtiki township	By 2055… within the township, in the short term, a controlled approach to infill is taken due to the flood risks present in the township increasing due to climate change. In the medium to long-term, as risks and potential mitigations are clearly understood and implemented, the degree to which infill or intensification of the township can be supported may change. Also in this timeframe, the Hukutaia development area is expected to emerge as an important growth area adjacent to the township which provides a resilient option for further development.	• Infill and intensification within the township will be considered on a case-by-case basis until a risk assessment and mitigations plan are prepared which make further recommendations. • This would consider both the risk profile and mitigation options, providing a recommendation about the best ways to keep people safe (e.g., through investment into factors like flood warning systems, evacuation planning, etc) based on consideration of costs and benefits.
Hukutaia	By 2055… Hukutaia develops into a vibrant new growth area with capacity for around 2,000 dwelling units, local commercial services, parks, and open spaces.	• District plan change / structure plan • All new infrastructure is dependent on new Council budgets or external funding. • Reticulated wastewater services are needed. • New river crossing for water and wastewater services.

Place	By 2055…	Critical pre-requisites
		• A common approach to stormwater management for the entire growth areas is facilitated by Council.
Rural residential enablement	By 2055… careful consideration of highly productive lands has led to the loosening of rural residential development rules in selected locations where performance criteria can be achieved. Zoning in these locations encourages sustainable land use, subdivision, and building design outcomes (such as off-grid or hybrid infrastructure solutions). Development will be led by the market. Rural residential performance criteria direct that this may take place in areas away from unacceptable natural or man-made hazards and protected natural areas, where it avoids highly productive lands and does not cause reverse sensitivity constraints toward horticultural, agricultural, industrial activities. And it should not cause transport infrastructure maintenance and operating costs to rise, or network safety performance to decrease.	• Further investigation of areas that meet the performance criteria. • District plan change for rural residential areas that meet performance criteria.
Whakatane Township and Kopeopeo	By 2055… The township remains the economic centre for the sub-region, with increasing vibrancy of the town centre supporting a local and sub-region wide catchment. Additional commercial land has been in the vicinity of the township. The focus for residential redevelopment and infill is areas of higher elevation, like the Kopeopeo area, as these areas are more resilient to flood hazards. This area sees a slow and steady pace of infill redevelopment, including more side-by-side multi-unit developments and low-rise apartments that meet a need for smaller sized houses. While there is some water and wastewater capacity to accommodate more development, stormwater management continues to be a limiting factor. In lower lying areas, Whakatāne township has changed the district plan to be more restrictive for infill and intensification in areas of town which are more exposed to residual risk from overdesign flood events.	• The district plan review should include a natural hazard risk-based review of existing infill and intensification provisions throughout the township, to mitigate risks from more people living in areas susceptible to evacuation orders and hazard events. • It also will re-examine the zoning provisions at Kopeopeo and other suitable areas (e.g., the town centre, Hillcrest/Appenzell, others as may be determined) to ensure they are sufficiently enabling for intensification and infill development.
Te Teko	By 2055… a risk-based approach enables development in areas where effective mitigations can ensure people's safety or risk is minimal. Te Teko is within the Rangitāiki Floodplain and major urban stopbanks run adjacent to the Rangitāiki River as a flood protection. These assets provide for a specific level of service and are still prone to a	• Completion of flood mapping. • A risk assessment and mitigations plan being prepared which makes further

Place	By 2055…	Critical pre-requisites
	risk of floodwater breaching the defence in a rainfall event that is greater than the defence is designed for (residual risk). Te Teko is also located downstream from the Matahina hydro-electric dam. While not highlighted as an area for substantial growth through the Spatial Plan, there may be opportunities for small scale developments to meet local demand for housing.	recommendations about where and how development could take place.
Tāneatua	The significant flooding event (2017) demonstrated the susceptibility of Tāneatua to flooding and a lack of safe evacuation routes. Flood mapping of the area is pending.	• Completion of flood mapping. • A risk assessment and mitigations plan are prepared which make further recommendations. • Development may bring forward need for Peketahi Bridge renewal.

14.2 Rural Southern Corridor

The focus for this corridor is on iwi-led housing and economic regenerative opportunities particularly related to established forestry and horticultural industries and new opportunities like water bottling. While the Spatial Plan captures some of the associated aspirations for these lands, the main emphasis sits with iwi to provide leadership and direction for councils to support.

Table 22 Rural Southern Corridor Iwi-led housing and economic regenerative opportunities

Place	By 2055…	Critical pre-requisites
Minginui and Te Whaiti	By 2055…. an increase in Māori housing and papakāinga provides opportunities for people of Ngāti Whare descent to relocate to Māori freehold land in Minginui and Te Whaiti. Marae and surrounding lands are prepared as an emergency civil defence hub for their people in case of emergencies that may block the community from nearby townships. Minginui grows sustainably, providing for the needs of whānau and creating a central recreation area and access to essential services. These areas and services remain accessible to the Te Whaiti community. The development of infrastructure in Minginui reflects a focus on self-sufficiency.	• Development of a master plan led by Te Rūnanga o Ngāti Whare and the Minginui Village Incorporated Society. • Review the district plan to ensure it enables the masterplan outcomes.

Murupara	By 2055… Murupara residents have worked towards their top priorities: hāpori spaces, improvements to public facilities, and access to healthcare and improved safety on roads and addressing housing needs. Two main changes have been considered through the Spatial Plan, being changing Evan's Park into a residential zone and rezoning land to reorient the central business area to the main road to service the travelling public. More broadly, some of the areas zoned for residential development have been taken up for new homes.	• Assessment of the feasibility of land transfer of Evan's Park, followed by a district plan change • Cost-benefit and feasibility analysis and engagement on shifting the commercial centre, possibly followed by a district plan change for commercial rezonings depending on the outcome • Finalise Murupara master plan. • Infrastructure is expected to be delivered through existing infrastructure renewals programmes. Additional planning is required to confirm.

14.3 Eastern Coastal Corridor

The focus of this corridor is on iwi-led economic development opportunities, particularly including growth within horticulture and aquaculture industries. Papakāinga and other Māori housing opportunities are supported outcomes. Te Kaha is the primary local service centre.

Table 23 Eastern Coastal Corridor Iwi-led housing and economic regenerative opportunities

Place	By 2055…	Critical pre-requisites
Te Kaha and other coastal areas	By 2055… Additional industrial areas have developed in relation to aquaculture / horticultural activities east of Ōpōtiki township up the coast, including the Te Kaha area. Papakāinga and Māori-led housing has grown to meet iwi aspirations, becoming a larger part of the overall housing mix.	• District plan changes to recognise industrial land uses and facilitate economic activities.

14.4 Areas not being considered further as part of the preferred new scenario

Some areas were put forward earlier as part of the technical work or by submitters. These have been reviewed against up-to-date natural hazards information. Due to natural hazards constraints, these areas are not being considered as places where additional development capacity should be allocated in addition to what is already in the district plans.

Table 24 Areas not being considered further as part of the preferred new scenario

Place	Key constraining factor(s)
Ōhope	Ōhope is a high demand residential location due to the environmental amenity of the coastal area. There are substantial constraints from flood hazards and coastal inundation that preclude much development taking place. Natural hazard mapping is under review, and there is unlikely to be substantial capacity to infill or intensification in this area.
Edgecumbe	Edgecumbe is within the Rangitāiki Floodplain and major urban stopbanks run adjacent to the Rangitāiki River as a flood protection measure for these settlements. These assets provide for a specific level of service and are still prone to a risk of floodwater breaching the defence in a rainfall event that is greater than the defence is designed for (residual risk). Edgecumbe is also located downstream from the Matahina hydro-electric dam. In previous heavy rain events, floodwater has been pre-emptively released from the spill gates of the dam to relieve the water pressure and lessen the impact of flooding upstream and downstream. The significant flooding event (2017) demonstrated the susceptibility of the location.

Place	Key constraining factor(s)
Keepa Road area and Paroa Road area near to Whakatane township	These areas are protected by stopbanks. These assets provide for a specific level of service and are still prone to a risk of floodwater breaching the defence in a rainfall event that is greater than the defence is designed for (residual risk).
Māori freehold land to east of the Charter Club, Ōhope	Moderate to high susceptibility to landslide from extreme rainfall. Some mitigation could be feasible and could support development, although this would be limited. Land to the east of Maraetotara Stream is within a floodplain. The area is partially located in low-lying area at the fringe of Pohutukawa Avenue and at the entrance of Ōhiwa Harbour, limiting yield potential.
Maraetotara Valley in Ōhope	Moderate to high susceptibility to landslide from extreme rainfall. Some mitigation could be feasible and could support development, although this would be limited. Land to the east of Maraetotara Stream is within a floodplain. Road access is likely to be compromised due to flooding.
Paerata Ridge, near Opotiki township	Paerata Ridge is not a viable option for greenfield development due to topographical constraints and natural hazard risk (landslips). The area also has highly productive horticulture land with Land Use Class 2 soils which are to be protected from inappropriate subdivision, use and development.
20 ha parcel across from Dunlop Road, Ōpōtiki, Lot 1 DP 7114	These sites are within the floodplain of Te Karaka and Kukumoa streams, exposed to river and stream flooding and coastal inundation. Very low elevations above sea level.

Baird Road, Ōpōtiki	Any development decisions around the Baird Road area require a precautionary approach for industrial development due to flood risk and wastewater treatment plant upgrades. Opotiki District Council will decide on the best location to provide for future industrial growth within the wider area before a decision is made regarding Baird Road.

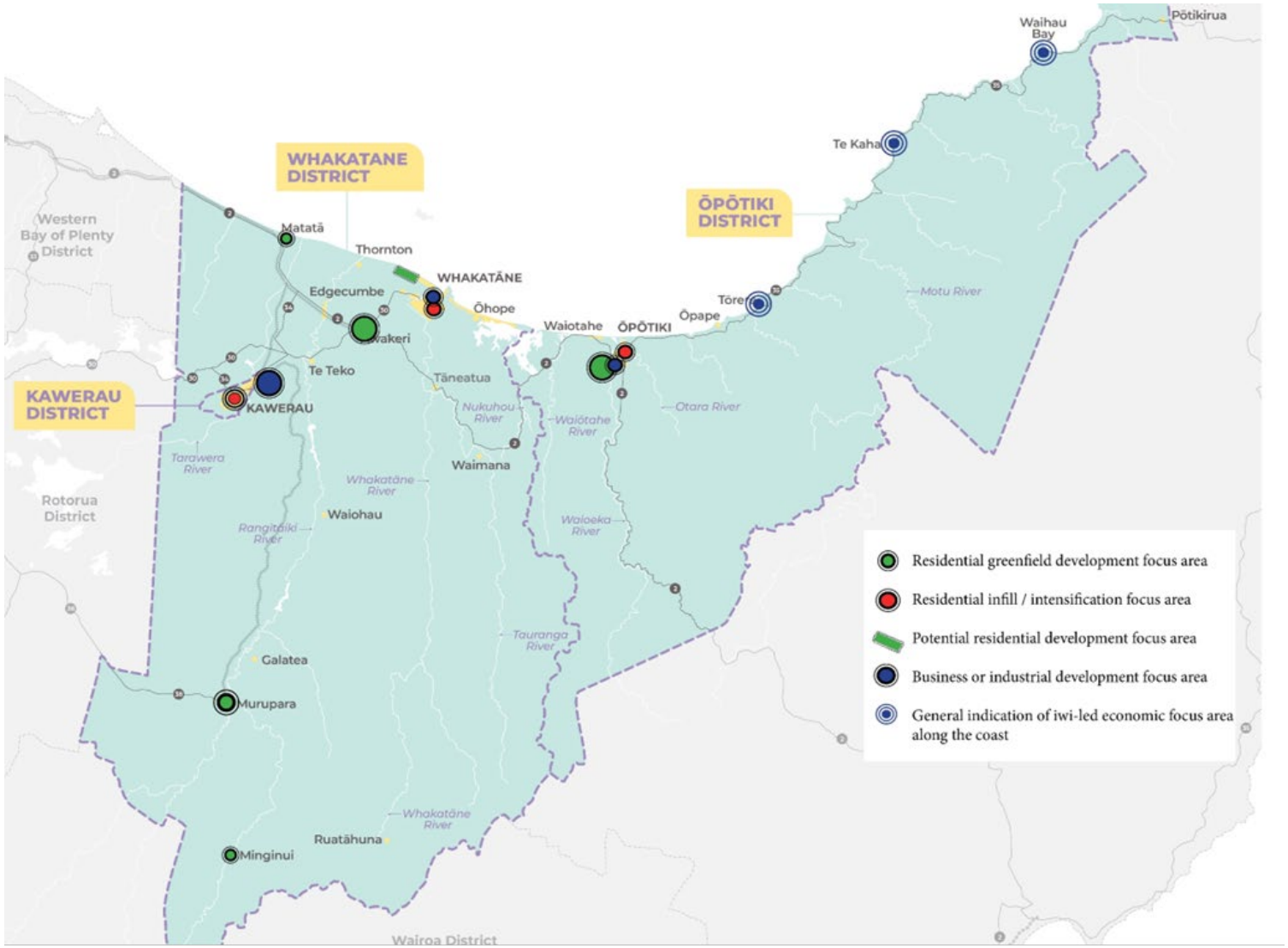

Figure 23: New scenario

15 Next steps

This report is a key evidence base for the Spatial Plan and associated implementation priorities. The Spatial Plan will aim to support quality, well-functioning urban areas by identifying areas appropriate for future development and their related infrastructure requirements. It will set the strategic direction for the spatial elements of the sub-region and actively manage growth through integrated planning, strong partnerships, and associated implementation of an action plan.

The preferred new scenario for the spatial plan will need to be underpinned and promoted by a range of important mechanisms:

- Comprehensive investment in core infrastructure. It is important that this investment is signalled in advance and that planning and provision is aligned with land use decisions. Collaborative planning undertaken when developing infrastructure strategies and transport plans will be the mechanism to address and resolve any potential misalignment of investments.

- A strong focus on implementation, supported by local area development planning in close collaboration with local communities and relevant iwi to masterplan locations earmarked for change.

- Regular monitoring and reporting of population changes and land supply (e.g., during revisions to the Spatial Plan, and in Long Term Plans and infrastructure planning activities) is needed. This can enable adaptable implementation of funding and infrastructure programmes to ensure investment can slow down or speed up to keep pace with demand.

Appendix 1

Eastern Bay of Plenty Housing and Business Needs Research, MRCagney (NZ) Ltd (2023)

MRCagney

BETTER TRANSPORT • BETTER PLACES • BETTER CHOICES

Eastern Bay of Plenty Housing and Business Needs Research

Final

Prepared for: Whakatāne District Council

Prepared by: MRCagney (NZ) Ltd

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Quality Assurance Register

Issue	Description	Prepared by	Authorised by	Assured by	Date
1	Draft Report	SM, DG	JV	ACF	30/06/2023
2	Final Report	SM, DG, RH	JV	ACF	28/07/2023
3	Revised Report 1	DG	SM	SM	13/09/2023

Executive Summary

This report was commissioned by Whakatāne District Council to help inform the Eastern Bay of Plenty (BoP) spatial planning process. It covers the entirety of the Eastern BoP and includes information about Whakatāne, Ōpōtiki, and Kawerau Districts.

The population of the Eastern BoP had been stagnant or falling from at least the late 1990s through to the early 2010s. While the population of Whakatāne District had remained relatively constant during this time, the populations were falling in Ōpōtiki District and Kawerau District. Consequently, the projections for future growth in these districts were quite reserved. Even as the population started to grow in these districts starting in 2014, it was unknown whether this was a temporary uptick or a permanent shift in trend. In the interim, the populations continued to grow each year and it appears that the Eastern BoP has truly entered a new period of growth.

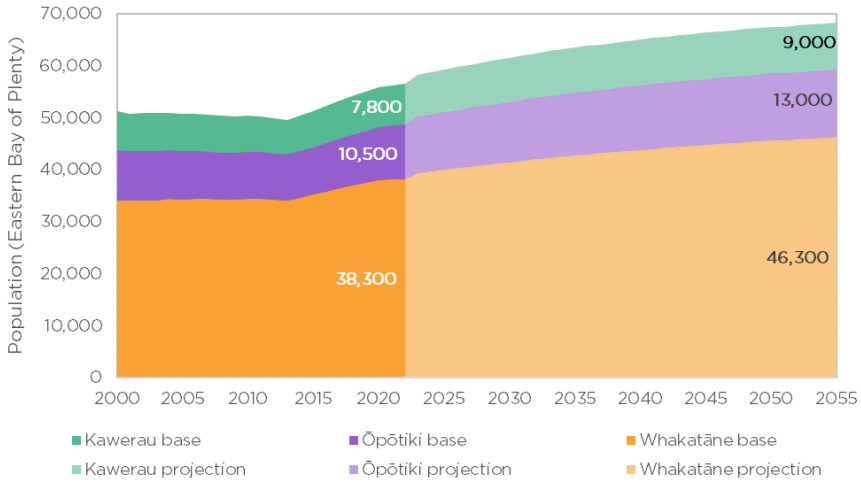
Along with this growth comes a need for an informed spatial planning process. To help with this process, this report provides two main categories of information:

- Data, trends, and facts about Eastern BoP
- Projections of future population growth and the resulting demand for residential and business land.

To provide context for the spatial planning process, we analysed recent trends of economics and demographics in Eastern BoP. Across all three districts, housing has become more unaffordable. The median house purchase price has gone up more in Eastern BoP than it has nationally, implying that the area is becoming relatively less affordable. And in contrast to the national trend of rental affordability staying relatively constant, in Eastern BoP, rents have become less affordable over the past ten years. That is, regardless of the metric used, housing in the Eastern BoP has become less affordable over time and affordability has worsened compared to the national average.

Recent construction trends show that more is being built and that the typologies are changing, albeit at a moderate pace. Townhouses, particularly in Whakatāne, are becoming more popular and make up an increasing share of new dwellings consented.

Whakatāne is the hub of the Eastern BoP with about two-thirds of the population and where three-quarters of the Eastern BoP's retail spending takes place. Retail spending in all parts of Eastern BoP has increased in the past three years (26% in Whakatāne, 20% in Ōpōtiki, and 35% in Kawerau), and at rates well above the increase in the rest of New Zealand.



All this growth means that more land will likely be needed for both residential and business purposes. To inform the projections for land demand, new population projections were produced, considering the trend of growth over the past ten years. The medium (most likely) population projection estimates that the populations will grow significantly between now and 2055. Whakatāne is projected to add 8,000 residents to its current population of approximately 38,300, for a projected 2055 population of 46,300. Ōpōtiki is projected to increase from 10,500 to 13,000, and Kawerau is projected to increase from 7,800 to 9,000. Of course, all these

people need to live, work, and shop somewhere. This growth in population directly drives demand for housing and business land.

Note: while we are confident that these are the best population projections that could be developed, we recommend that they be reviewed and reconfirmed regularly (e.g., every three years), using the most recent trends and information about changes in the region.

Projected demand for residential land

Using the medium population projections discussed previously, and informed by assumptions on household formation, housing typology preferences, and average densities of development, the demand for residential land in Eastern BoP is projected to be:

- 91.6 hectares of residential land over the short term (2023-2026).
- 84.2 hectares of residential land over the medium term (2027-2033).
- 140.4 hectares of residential land over the long term (2034-2053).

In total, there is projected to be demand for an additional 316 hectares of residential land across the Eastern BoP between now and 2053.

Projected demand for business land

The demand for business land is also based on population projections. These projections, along with assumptions on the share of population that is working-age, labour force participation rates, share of employment by industry, and land needed per employee, the demand for business land in Eastern BoP is projected to be:

- 27.5 hectares of business land in the short term (2023-2026)
- 30.7 hectares of business land in the medium term (2027-2033)
- 27.1 hectares of business land in the long term (2034-2053)

Across the Eastern BoP, an additional 85 hectares of land is projected to be needed by 2053 to satisfy the demand for business land.

Total growth in demand for land

Type of land demanded	**Time Frame**			
	Short Term (2023-2026)	Medium Term (2027-2033)	Long Term (2034-2053)	Total (2023-2053)
Housing	92 ha	84 ha	140 ha	316 ha
Industrial business land	19 ha	21 ha	19 ha	59 ha
Commercial business land	8 ha	9 ha	8 ha	26 ha
Total*	**119 ha**	**115 ha**	**167 ha**	**402 ha**

**note: numbers may not add exactly due to rounding*

Contents

Figures

Tables

Glossary

Term	Meaning
BoP	Bay of Plenty
FDS	Future Development Strategy
McDermott Report	Whakatāne Economic Development Prospects Final Report: Prospects and Policies (McDermott Consultants, 2017)
ME Report	Whakatāne District Housing Demand (Market Economics, 2021)
MRC	MRCagney
OCR	Official Cash Rate
PGF	Provincial Growth Fund
pp	Percentage points
RCG Report	Whakatāne Demand Assessment (RCG, 2020)
RSE	Recognised Seasonal Employer
SA2	Statistical Area 2

1 Introduction

Whakatāne District Council (WDC) on behalf of the three district councils in the Eastern Bay of Plenty (BoP) – WDC, Kawerau District Council (KDC), and Ōpōtiki District Council (ŌDC) – is preparing a spatial plan for the Eastern BoP.

As part of this work, WDC needs to have robust, easily defensible estimates of the future requirements for business and residential land.

The Eastern BoP is a Tier 3 urban area according to the National Policy Statement on Urban Development 2020 (NPS-UD)[1]. As an area of the country that does not fall under a Tier 1 or Tier 2 urban area definition, a full Housing and Business Capacity Assessment (HBA) is not required by NPS-UD. Section 3.19 (1) of the NPS-UD states that:

> *Every tier 1 and tier 2 local authority must prepare, and make publicly available, an HBA for its tier 1 or tier 2 urban environments every 3 years, in time to inform the relevant local authority's next long-term plan.*

That said, "tier 3 local authorities are strongly encouraged to do the things that tier 1 or 2 local authorities are obliged to do under Parts 2 and 3 of [the NPS-UD]". This will help those authorities prepare their spatial plans and/or future development strategies.

This report supplies WDC with a variety of information that will help inform the spatial planning process and is laid out in the following way:

- Section 2 provides a brief review of the previous reports and the rationale for the current update
- Section 3 looks at current population, demographics, and incomes
- Section 4 details the population projections, household projections, and the demand for residential and business land
- Section 5 provides a brief look at travel patterns in the Eastern BoP
- Section 6 analyses recent economic trends like the affordability of housing and household spending
- Section 7 gives a brief summary and describes what is projected to occur in the Eastern BoP over the next 3, 10, and 30 years

[1] https://environment.govt.nz/assets/publications/National-Policy-Statement-Urban-Development-2020-11May2022-v2.pdf

2 Review of previous reports and historic data

The Eastern BoP has commissioned previous reports to look at data, trends, and information similar to this report. From newest to oldest, these are:

- *Whakatāne District Housing Demand* prepared by Market Economics and delivered in June 2021
- *Whakatāne Demand Assessment* prepared by RCG and delivered March 2020
- *Whakatāne Economic Development Prospects Final Report: Prospects and Policies* prepared by McDermott Consultants and delivered in December 2017

2.1 Previous reports

This section provides a brief review of the findings of these reports.

"Whakatāne District Housing Demand" – Market Economics

In June 2021, Market Economics delivered this report ("ME Report") to WDC. This report, despite its title, covered both WDC and KDC areas. It did not include ŌDC.

The ME Report provides historic context of the population and housing stock of WDC and KDC. It points out that after a long period of essentially no population growth, the last several years (leading up to 2021) have seen quite high population growth in the districts. It pointed out that WDC and KDC, like the rest of the country, are expected to have an aging population.

Critically, the report found that, "there will be shortages of both standalone houses and attached units. In order to avoid shortages of supply, Council will need to introduce new policy to allow more opportunities for both intensification and greenfield development."

Other findings included the fact that the housing stock is older and tends to be quite traditional – single-storey dwellings of relatively large size. Given the age of the dwelling stock, there is the possibility that it is not meeting the current needs of residents. There have been a few developments of more dense housing typologies, but these are still quite the minority.

Finally, the ME Report compared the demand for dwellings to the supply of housing allowed under the Operative District Plan. It found that while in the short-term, there was likely to be sufficient supply of development opportunities to satisfy demand, in the medium- and long-term, this is unlikely to be the case.

"Whakatāne Demand Assessment" – RCG

In March 2020, RCG delivered this report to WDC ("RCG Report"). Unlike the Market Economics report, this report did not look at the supply of housing – only the demand. It also examined the underlying statistics and demographics that drive demand trends.

The RCG Report provided a range of population projections, only for the WDC area and not the whole Eastern BoP, and converted these to household estimates. It also looked at employment trends to estimate projections for future employment. Both these pieces of information were used, along with some assumptions, to estimate the need for developable land in the district. These estimates were intended to inform WDC's Future Development Strategy (FDS).

"Whakatāne Economic Development Prospects Final Report: Prospects and Policies" – McDermott Consultants

In December 2017, McDermott Consultants delivered a report ("McDermott Report") to WDC. While this report is largely outdated at this point, there are some important contributions to the other reports discussed that are worth mentioning. Like the RCG Report, this was an exercise in estimating the demand for housing and business land, rather than a full demand and supply analysis.

The McDermott Report set up a rational modelling process for determining the demand for both business and residential land, but it appears the main purpose was to examine the impact of potential employment projects (via the Provincial Growth Fund) on the Eastern BoP population and business landscape.

2.2 Rationale for updates

While each of the previous reports provides a reasonable estimate of the growth expected in the Eastern BoP, the main reason for updating these analyses is so that a spatial plan for the region can be developed using the most appropriate information. Previously, neither ŌDC or KDC statistics and projections have been holistically included so that each individual district, as well as the whole Eastern BoP Region can be assessed.

Additionally, population growth has been higher than even the highest projections which means that even projections of demand for developable land that are just a year or two old can be significantly inaccurate given the new information.

3 Current Population, Demographics, and Trends

This section looks at historic and current patterns of population, income, and demographic statistics. These form the basis for where the Eastern BoP is currently and set the baseline for growth.

3.1 Historic population growth

This section shows the historical population growth for Whakatāne, Kawerau and Ōpōtiki. The purpose of this is to highlight that recent growth in each of these districts has been higher than previously anticipated.

Figure 1 compares (for Whakatāne) the 2022-base Stats NZ population estimates with the 2019-base Stats NZ population estimates and the three high growth projections from the *Whakatāne Demand Assessment* (RCG, March 2020). Two different Stats NZ (historical) population estimates are included because these remain provisional for up to two years to allow them to be revised to incorporate changes in international migration estimates. The 2022-base population estimates have revised the 2019-base estimates to be higher than previously expected.

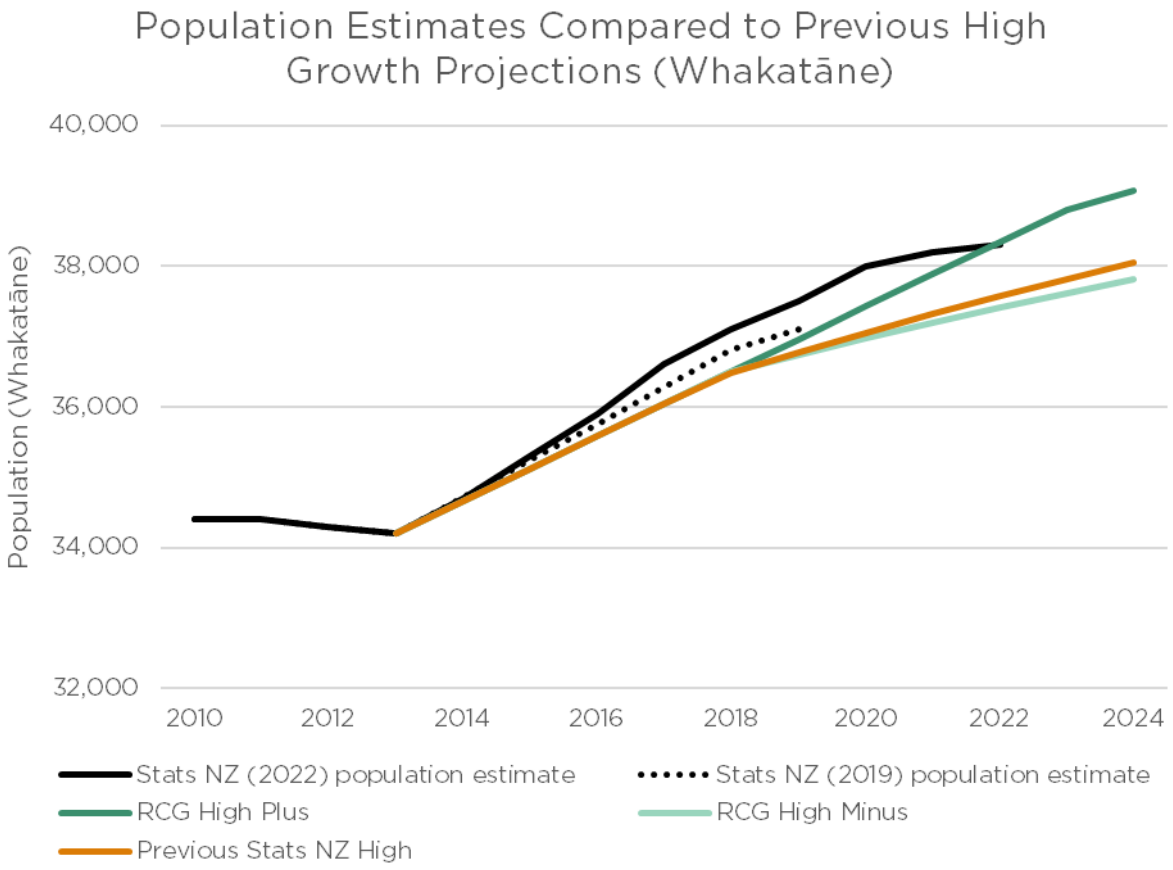


Figure 1 Population estimates compared to previous high growth projections for Whakatāne

The key insights from this chart are:

- The most recent (2022-base) Stats NZ population estimates have a revised view of the past. In the years 2014 -2019, Stats NZ now estimates that the population was higher than previously thought. Note that the 2022 projections are still provisional for 2021 and 2022.
- The recent Stats NZ population estimates are higher than all the previous high growth projections, including from Stats NZ and RCG.

Figure 2 and Figure 3 show the previous (2019-base) Stats NZ population estimates and the most recent (2022-base) Stats NZ population estimates for Ōpōtiki and Kawerau. Like for Whakatāne, the estimates for these districts were revised in 2022, with higher population estimates than previously for 2014-2019. In 2022, the population estimates were 38,300 for Whakatāne, 10,500 for Ōpōtiki, and 7,760 Kawerau.

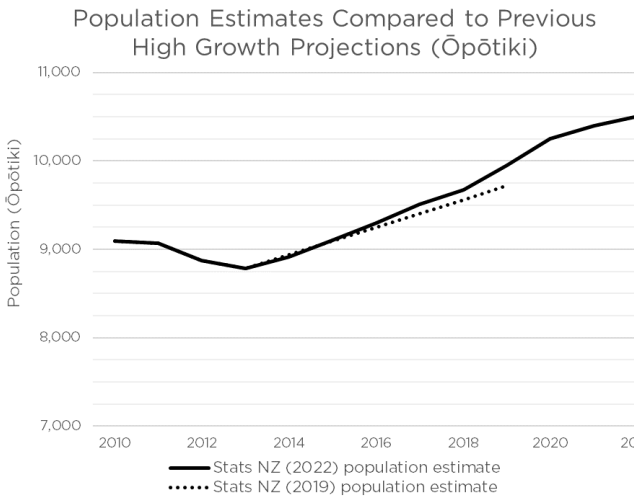


Figure 2 Previous and current Stats NZ population estimates for Ōpōtiki

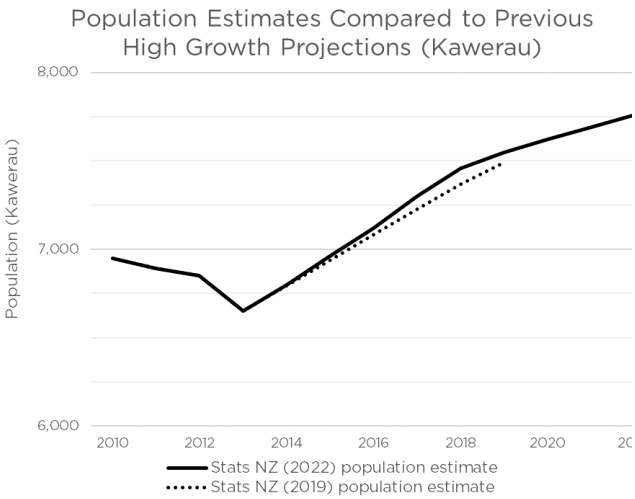


Figure 3 Previous and current Stats NZ population estimates for Kawerau

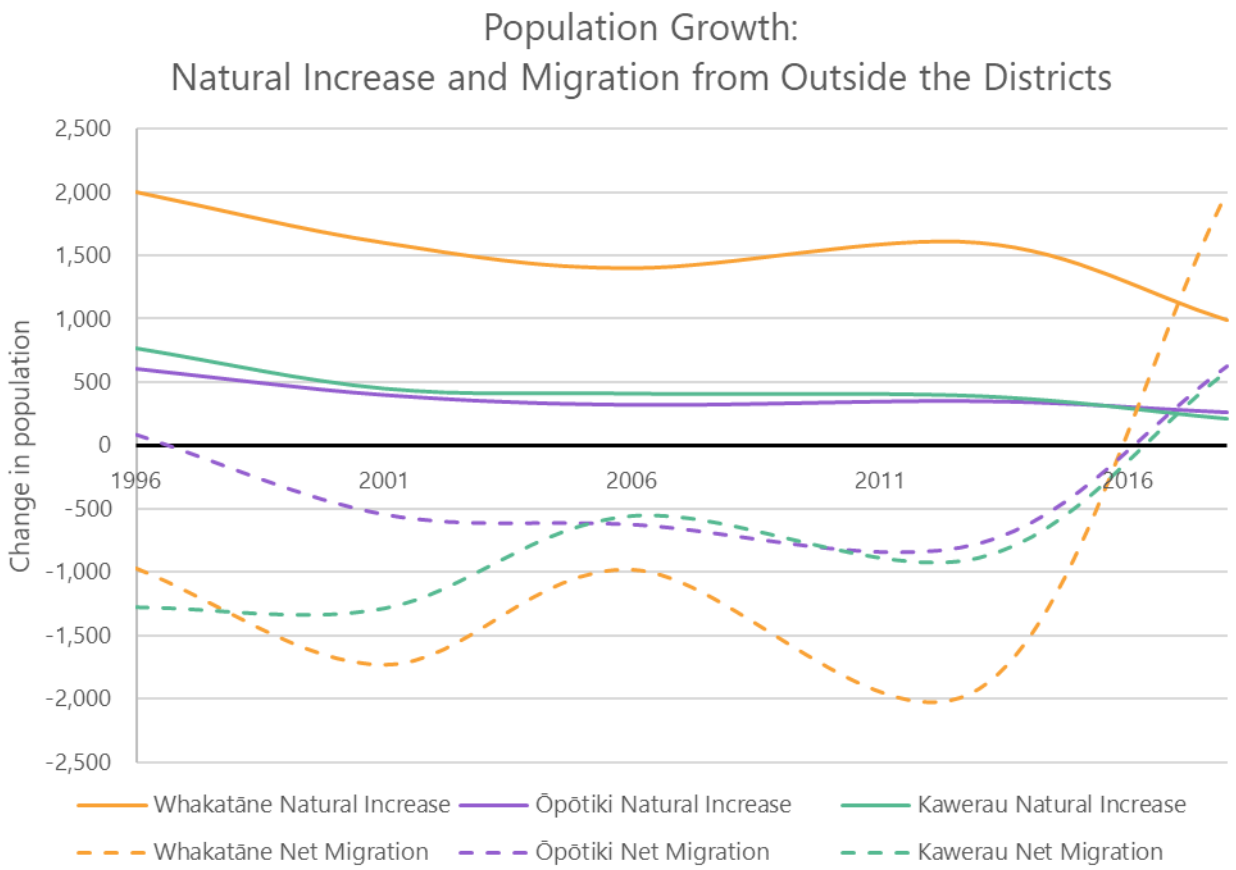
Because Stats NZ population estimates remain provisional for up to two years after release to allow for changes to international migration estimates to be incorporated, it is not unusual that these revisions have been made.

3.2 Source of population growth

Figure 4 shows the trend of natural increase (i.e. births and deaths) and net migration for each district within the Eastern BoP. Net migration is the difference between the number of new arrivals into the district (either from other parts of New Zealand or from overseas) and the number of resident departures. All three districts have had positive but declining natural increase in population since 1996 (i.e. births within each district have been higher than deaths). Natural increase in population across these districts from 2013-2018 was about 3% of the 2013 population.

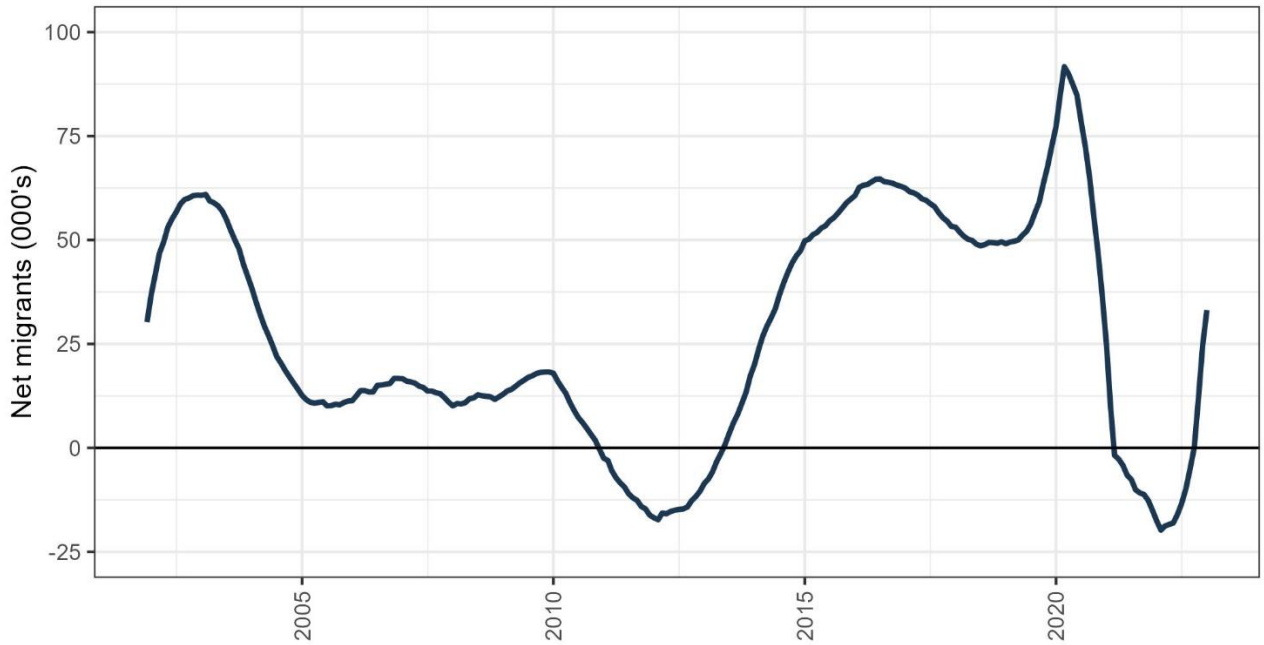
All three districts had negative net migration from 2001-2013 (more people leaving the district than moving to it) followed by positive net migration from 2013-2018 (more people moving to the district than leaving it). The net migration from 2013-2018 was a large driver of population growth in each of the districts, making up around 70% of total growth. New Zealand's national immigration settings may therefore be an important driver of growth in this region, especially as immigration seems to be returning to pre-pandemic levels nationally – though not quite yet to the peak seen in the 2015-2019 period. National levels of migration are illustrated in Figure 5, and while the data at the national level and the data at the district level are not available on the same time scales, we can see that when net international migration is high, the net migration to the Eastern BoP seems to follow suit.

Figure 6 shows that net migration was a significant source of population growth for each of the districts in 2022, making up around 70% of growth.



Source: Stats NZ

Figure 4 Source of change in population by Census year



Source: Stats NZ

Figure 5 Annual net migration to New Zealand, 2002 - 2022

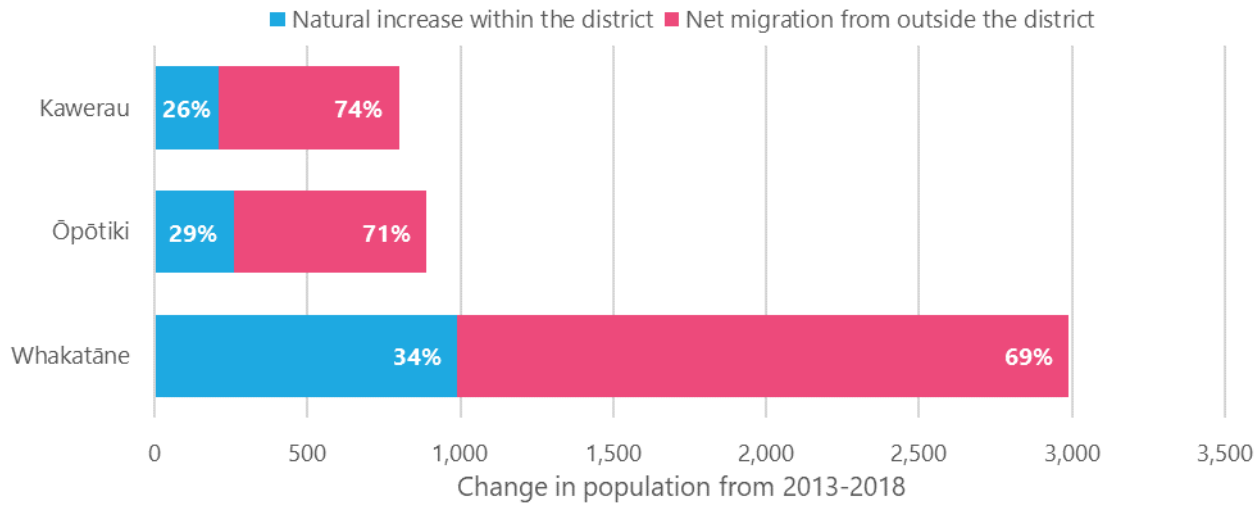


Figure 6 Source of population growth, 2013-2018

3.3 Current population demographics

The Eastern BoP has a somewhat unique ethnic breakdown when compared to the breakdown for all of Aotearoa.

Population by ethnicity

Figure 7 shows the current share of population by ethnicity for New Zealand as a whole and for each of the three districts in the Eastern BoP.

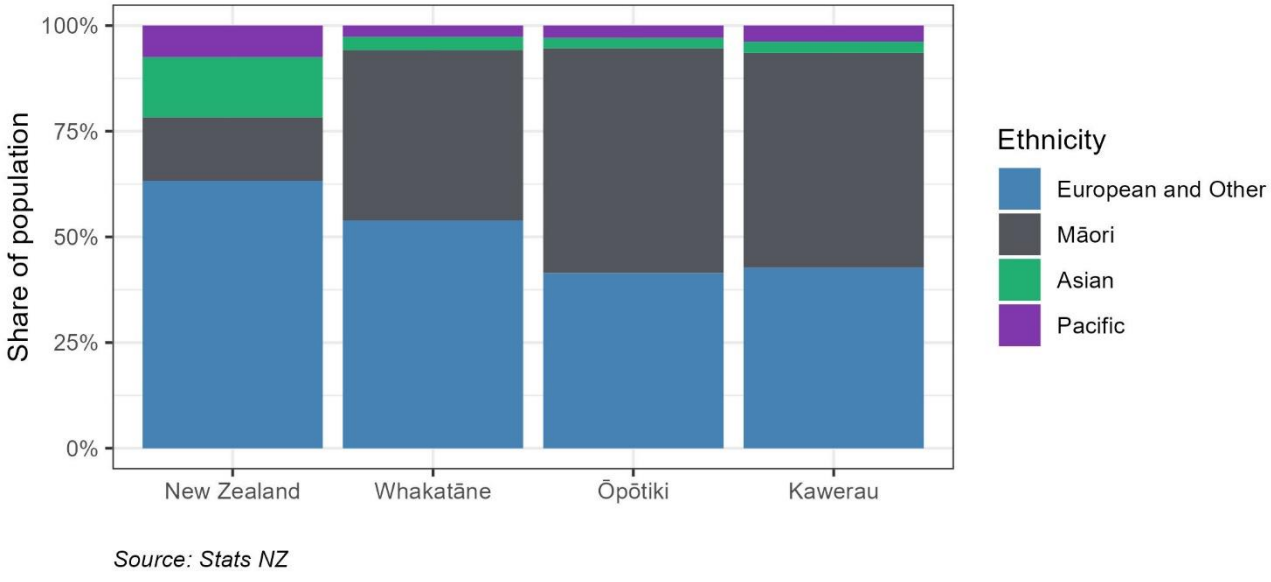


Figure 7 Share of population by ethnicity, by district, 2018 Census

It is clear from this figure that Māori are a much larger share of the population in the Eastern BoP than they are in New Zealand in general. People who identify as Māori are estimated to be approximately 15% of the

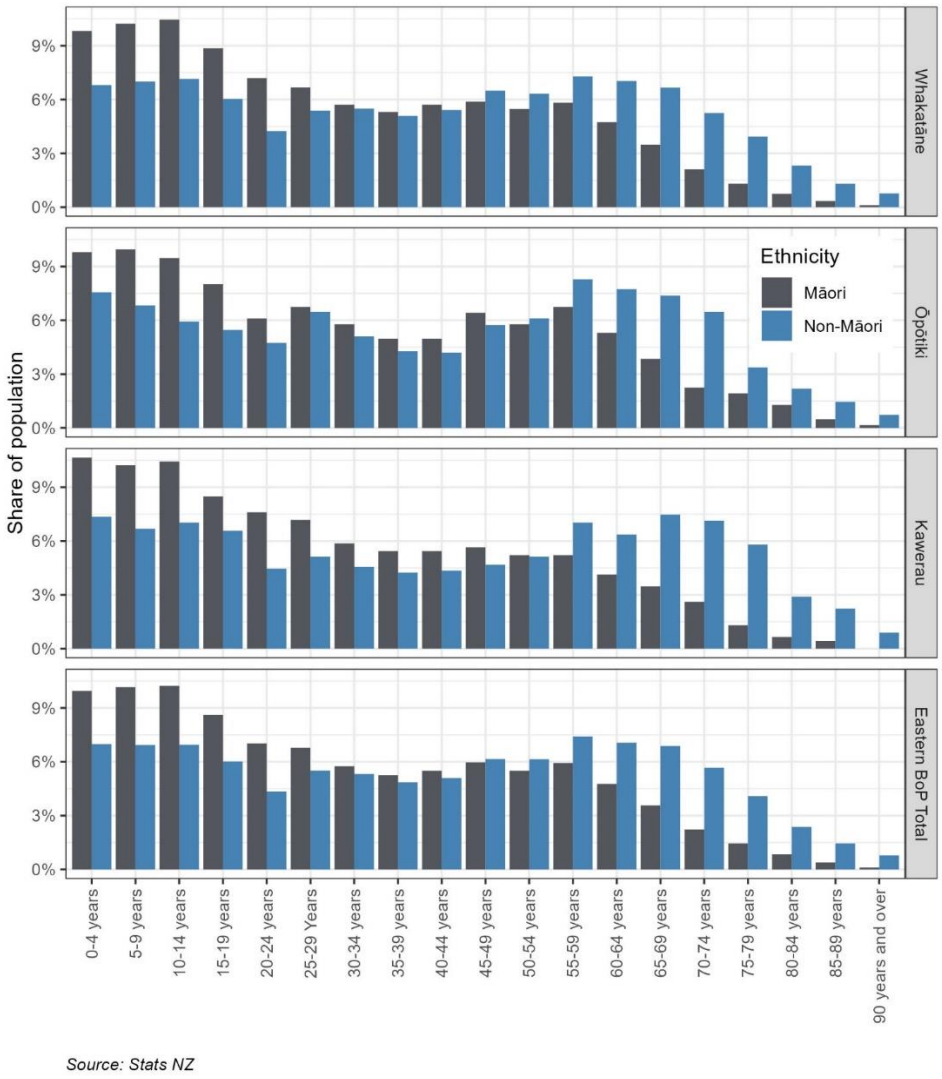
New Zealand population. In WDC, this figure is approximately 40% and in ŌDC and KDC, this figure is over 50%. These statistics may be important as the NPS-UD requires councils, when preparing their FDS, to be informed by "Māori, and in particular tangata whenua, values and aspirations for urban development". It also demonstrates that the challenges and opportunities in the region may be different than for other areas of the country.

Population by age and ethnicity

Figure 8 illustrates the 2018 population of WDC, ŌDC, and KDC by age and ethnicity (Māori and Non-Māori). It is quite easy to see that across all three districts, the Māori population is significantly younger than the Non-Māori population. For instance, in WDC, the largest age cohort for Non-Māori is the 55-59 age group, while for Māori, it is the 10-14 age group. Very similar patterns exist in both ŌDC and KDC.

This pattern is repeated for the Eastern BoP as a whole with under-15's as the three largest age cohorts for Māori and 55-69 years old the three largest age cohorts for Non-Māori.

These differences in age cohorts by ethnicity inform the projected populations, which are discussed in Section 4.



Source: Stats NZ

Figure 8 Share of population by age, by ethnicity, by district, 2018 Census

Households by ethnicity

In terms of households, a custom data query from Stats NZ using the 2018 Census was used to look at the number of Māori and Non-Māori households in each of the districts. This is a nearly complete assessment of the household composition, though there are a handful of households in each of the districts that either refused to answer ethnicity questions or their ethnicity was unable to be determined. Of the households that were able to be identified as Māori or not, 41.5%, 58.9%, and 53.2% identified as Māori in WDC, ŌDC, and KDC, respectively as shown in Table 1.

Table 1 Household demographics by district, 2018 Census

District	Household Type	Count	Share
Whakatāne	Māori	4,680	41.5%
	Non-Māori	6,597	58.5%
	Total	11,277	100%
Ōpōtiki	Māori	1,650	58.9%
	Non-Māori	1,152	41.1%
	Total	2,802	100%
Kawerau	Māori	1,209	53.2%
	Non-Māori	1,062	46.8%
	Total	2,271	100%

3.4 Household incomes

On average, Stats NZ estimates[2] that Māori households have relatively lower incomes than most other ethnic groups in Aotearoa. For instance, Māori have an approximately 16% lower average annual household equivalised disposable income than Europeans across the country. At the individual level, on a national average level, people who identify as Māori tend to have lower personal incomes[3] than those who do not identify as Māori. We wanted to see if this was true for Eastern BoP as well.

To do this, household incomes were categorised by Māori and Non-Māori households, and by income bands. Figure 9 shows the share of Māori and Non-Māori households in each income bracket by district. For the most part, the patterns are similar for Māori and Non-Māori households. The only notable difference in pattern appears to be in KDC where there is a higher proportion of Non-Māori households in lower income brackets and a higher proportion of Māori households in higher income brackets. In the other two districts, the patterns for Māori and Non-Māori households are quite similar to one another.

This data is also shown tabularly in Table 2 and Table 3. These tables give the income distribution at two levels of aggregation. Here we see that there are some small differences across districts and ethnicities. For instance, in WDC, there is a higher share of Māori households that make less than $20,000 than Non-Māori households. In KDC, the situation is reversed, with a higher share of Non-Māori households in the less than $20,000 income bracket. In ŌDC, the share of households in this income bracket is nearly identical between Māori and Non-Māori.

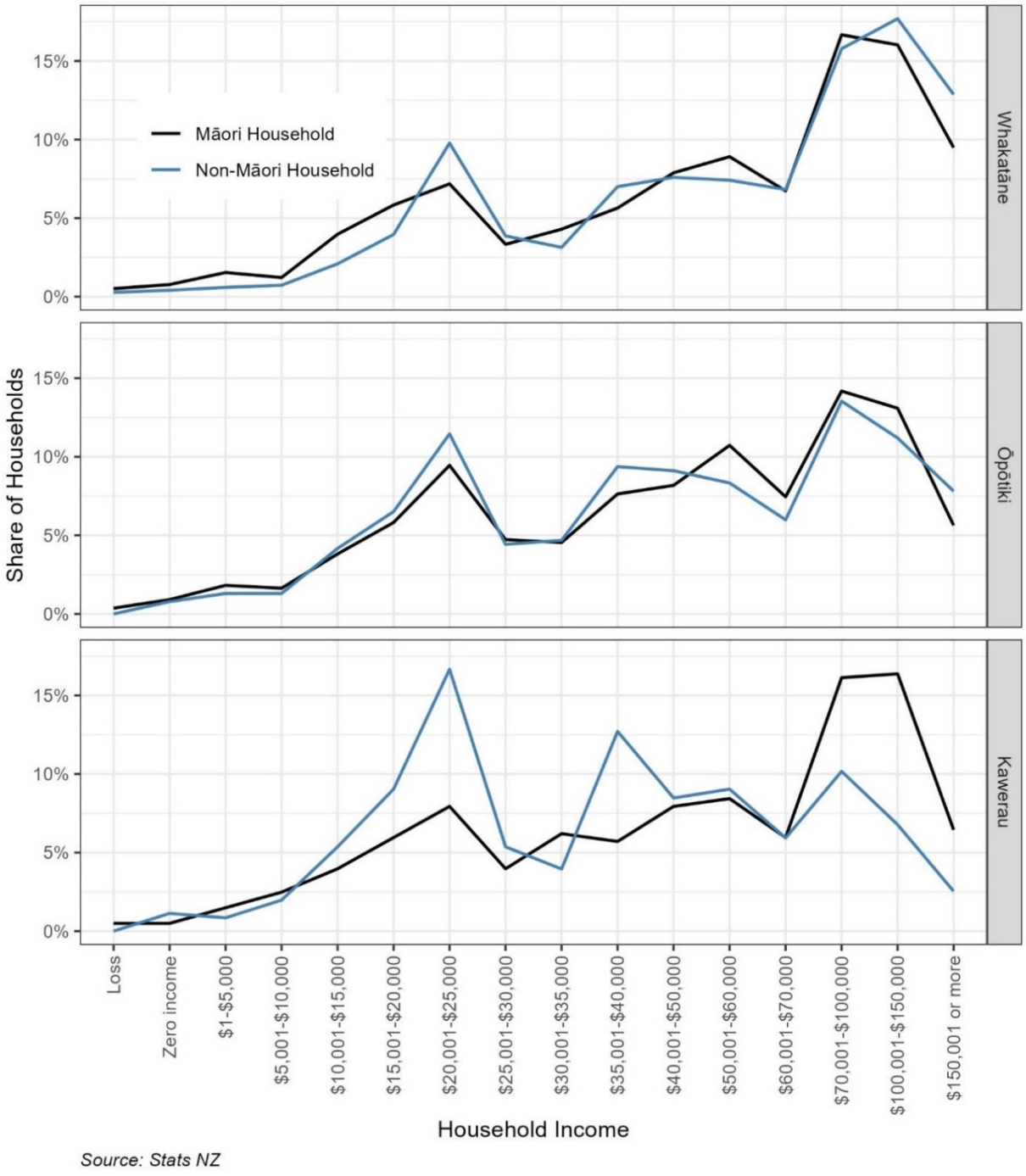
At the other end of the income spectrum, the share of households with more than $100,000 in income also varies by district. In WDC, approximately 25% of Māori households are in this income bracket, while more than 30% of Non-Māori households are. But in KDC, the scenario is the opposite – with 23% of Māori households making more than $100,000 while approximately 9% of Non-Māori households make this much. And,

[2] https://www.stats.govt.nz/information-releases/household-income-and-housing-cost-statistics-year-ended-june-2022/

[3] Measured by median weekly income from the data series Income by sex, region, ethnic groups and income source. Stats NZ.

consistent with the lower end of the income spectrum, in ŌDC, the numbers for Māori and Non-Māori households are quite similar with approximately 19% of households making more than $100,000, regardless of how they identify ethnically.

In aggregate, the fact that the incomes are so close for Māori and Non-Māori in the Eastern BoP runs counter to what is expected given the national data on incomes. The data indicates that household income is reasonably similar between Māori and Non-Māori households in the Eastern BoP and there is no immediately obvious reason why this is different for Eastern BoP than for the whole country. This is an area worth exploring with further research.



Source: Stats NZ

Figure 9 Household income by district, by Māori / Non-Māori household, 2018 Census

Table 2 Income distribution by household ethnicity, by district, 2018 Census

	Whakatāne		Ōpōtiki		Kawerau		Total Eastern BoP	
Income	Māori	Non-Māori	Māori	Non-Māori	Māori	Non-Māori	Māori	Non-Māori
Loss	0.5%	0.3%	0.4%	0.0%	0.5%	0.0%	0.5%	0.2%
Zero income	0.8%	0.4%	0.9%	0.8%	0.5%	1.1%	0.8%	0.5%
$1-$5,000	1.5%	0.6%	1.8%	1.3%	1.5%	0.8%	1.6%	0.7%
$5,001-$10,000	1.2%	0.7%	1.6%	1.3%	2.5%	2.0%	1.5%	1.0%
$10,001-$15,000	4.0%	2.1%	3.8%	4.2%	4.0%	5.4%	3.9%	2.8%
$15,001-$20,000	5.8%	4.0%	5.8%	6.5%	6.0%	9.0%	5.8%	4.9%
$20,001-$25,000	7.2%	9.8%	9.5%	11.5%	7.9%	16.7%	7.8%	10.8%
$25,001-$30,000	3.3%	3.9%	4.7%	4.4%	4.0%	5.4%	3.7%	4.1%
$30,001-$35,000	4.3%	3.1%	4.5%	4.7%	6.2%	4.0%	4.7%	3.4%
$35,001-$40,000	5.6%	7.0%	7.6%	9.4%	5.7%	12.7%	6.1%	8.0%
$40,001-$50,000	7.9%	7.6%	8.2%	9.1%	7.9%	8.5%	8.0%	7.9%
$50,001-$60,000	8.9%	7.4%	10.7%	8.3%	8.4%	9.0%	9.2%	7.7%
$60,001-$70,000	6.7%	6.8%	7.5%	6.0%	6.0%	5.9%	6.8%	6.6%
$70,001-$100,000	16.7%	15.8%	14.2%	13.5%	16.1%	10.2%	16.0%	14.8%
$100,001-$150,000	16.0%	17.7%	13.1%	11.2%	16.4%	6.8%	15.4%	15.5%
$150,001 or more	9.5%	12.9%	5.6%	7.8%	6.5%	2.5%	8.2%	11.0%
Total	100%	100%	100%	100%	100%	100%	100%	100%

Table 3 Income distribution (aggregated) by household ethnicity, by district, 2018 Census

	Whakatāne		Ōpōtiki		Kawerau		Total Eastern BoP	
Income	Māori	Non-Māori	Māori	Non-Māori	Māori	Non-Māori	Māori	Non-Māori
$20,000 or less	13.8%	8.0%	14.4%	14.1%	14.9%	18.4%	14.1%	10.1%
$20,001 - 50,000	28.3%	31.4%	34.5%	39.1%	31.8%	47.2%	30.2%	34.3%
$50,001 - 70,000	15.6%	14.2%	18.2%	14.3%	14.4%	15.0%	16.0%	14.3%
$70,001-$100,000	16.7%	15.8%	14.2%	13.5%	16.1%	10.2%	16.0%	14.8%
$100,001-$150,000	16.0%	17.7%	13.1%	11.2%	16.4%	6.8%	15.4%	15.5%
$150,001 or more	9.5%	12.9%	5.6%	7.8%	6.5%	2.5%	8.2%	11.0%
Total	100%	100%	100%	100%	100%	100%	100%	100%

3.5 Recent building trends

The recent residential building trends in the Eastern BoP are shown in Figure 10. Since 2010, there has not been much building activity in Kawerau, though it did pick up a bit from 2020 with approximately 20 total units consented per year. Of these new dwellings consented, there is an equal mix of standalone houses and townhouses. In Ōpōtiki, consenting has been trending upward, with almost all new development being of standalone houses. In Whakatāne, the construction of standalone houses and townhouses has been trending up since 2010, but standalone houses are the dominant typology. Projected future trends of dwelling typology are discussed in Section 4.2.

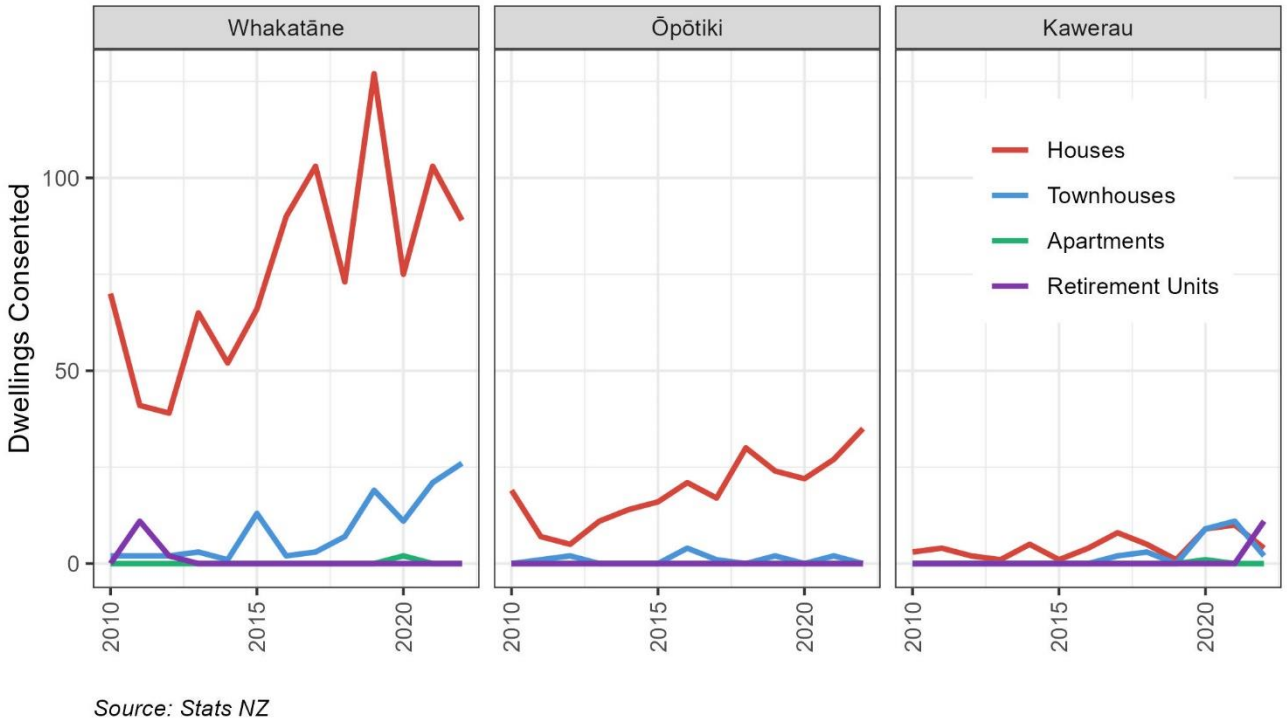


Figure 10 New dwellings consented by district, by typology, 2010 - 2022

3.6 Global economic trends and issues

The first domestic case of COVID-19 was detected in New Zealand on 28 February 2020, which began a period of fast-moving changes to the economy, immigration settings, and tourism rules. None of the previous analyses were done post-pandemic, and the impact of COVID-19 on the global, domestic, or local Eastern BoP economy have been unexamined.

The three years since have seen unprecedented changes to how people move both domestically (with lockdowns) and internationally (with border closures). Interest rates were dropped to record lows to stimulate the economy, then raised very quickly to combat near-record inflation in New Zealand. And globally there has been an economic slowdown with many countries experiencing weak economic growth and high levels of inflation.

Interest rates and housing/land prices

In March 2020, the Reserve Bank dropped the Official Cash Rate (OCR) from 1% to 0.25% and indicated it would stay that low for at least a year. The OCR stayed at 0.25% until October 2021 when it was raised to 0.5%. At every OCR announcement between October 2021 and May 2023 (there are 7 per year), the OCR was raised. In May 2023, it was raised to 5.5% where it remained in July 2023. This means that the OCR increased from 0.25% to 5.5% in the space of nineteen months to the highest level[4] in nearly 15 years.

House prices were one of the most visibly affected economic indicators. When the pandemic hit, New Zealand dropped into some of the strictest lockdowns in the world. Government acted quickly to support businesses and, consequently, unemployment did not increase. Aggressive action by the Reserve Bank ensured that interest rates were very low.

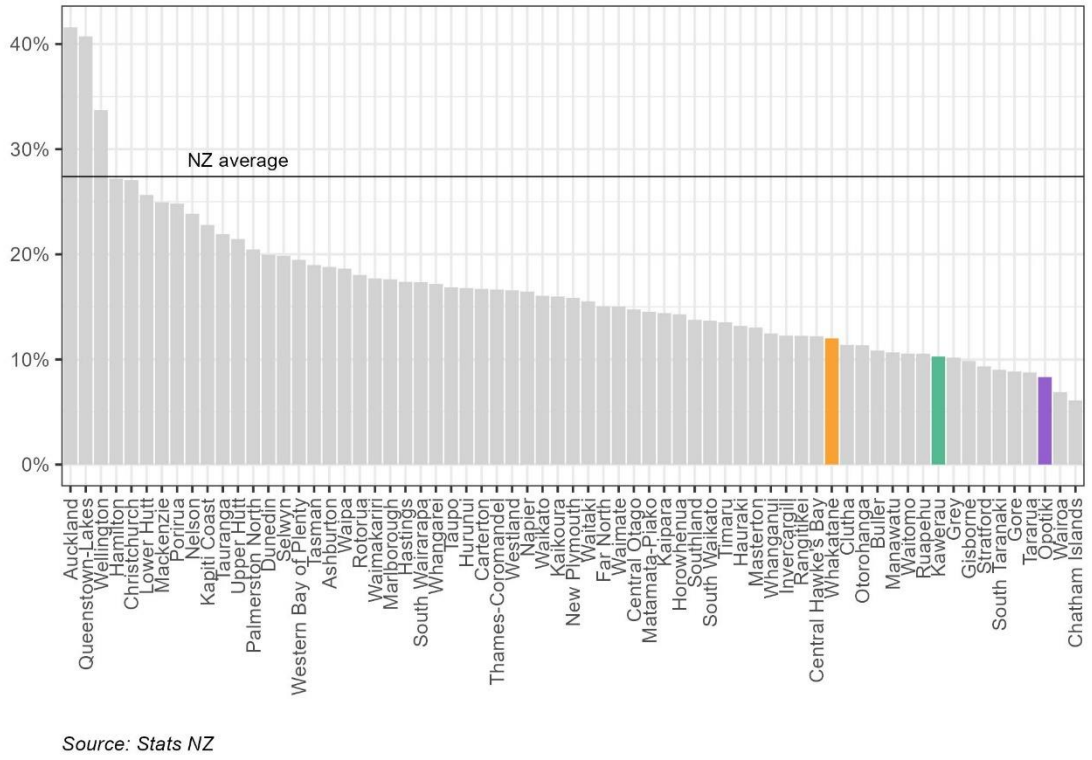
[4] https://www.rbnz.govt.nz/monetary-policy/monetary-policy-decisions#ocrchart

This led directly to an incredibly fast increase in the price of housing. And while house prices are off their peak point due to the rapidly increasing interest rates, the affordability of housing is worse now than pre-pandemic. This is discussed in detail in Section 6.1.

Immigration settings

On 14 March 2020, Government announced that anyone entering New Zealand would need to quarantine for 14 days and on 19 March the borders closed to everyone but NZ citizens and permanent residents. Throughout the remainder of 2020 and 2021, the border was closed to most international arrivals and the country was periodically at strict levels of the COVID-19 protection framework.

The working holiday visa scheme reopened on 14 March 2022 and by 31 July 2022, the borders were fully reopened to all international travellers and "business as usual" returned. It remains to be seen how quickly international migrant workers return to the Eastern BoP region, though it should be noted that WDC, ŌDC, and KDC have some of the lowest foreign-born population of any districts in New Zealand (WDC is ranked 51st, with KDC and ŌDC ranked 58th and 65th, respectively – out of the 67 districts, shown in Figure 11). It stands to reason that the Eastern BoP is likely less *directly* impacted by international migration than most other areas of the country.



Source: Stats NZ

Figure 11 Share of foreign-born population by district, Census 2018

4 Future Population and Land Needs

This section describes the updated population projections, employment projections, and estimated future land demand for each district within the Eastern BoP. It follows a similar methodology as has been used in previous projections for this region.

4.1 Population projections

We produced a set of draft population projections for each district, which was reviewed by each of the district councils before being finalised. The final projections are based on the most current knowledge at the time of producing this work. We recommend that the population projections are reviewed and reconfirmed regularly (e.g. every three years), using the most recent trends and information about changes in the region. Note that Stats NZ plans to release the first round of the 2023 Census results by the end of March 2024, at which point it would be worth comparing those latest population estimates against these population projections. This may inform whether the population projections need to be revised again sooner than otherwise planned.

The Stats NZ population projections are used as a baseline for each of the districts because these projections have been developed consistently across these districts and the rest of the country. These subnational projections make use of the latest population estimates and are aligned with the national population projections. Given the higher than expected growth observed in the past, an additional higher projection is also included.

For each district, we have produced a range of population projections. The descriptions for each of these projections are outlined in Table 4.

Table 4 Summary of population projection scenarios

Projection	Description	Source
Low	We think this is a reasonable and realistic low growth scenario for the Eastern BoP. The Stats NZ low projections are expected to be too low for these districts.	We have taken the Stats NZ Medium population projection as a low estimate for each region. For each district, this assumes very little overall change in the population over the next 30 years.
Medium	We think this is an appropriate 'most likely' growth scenario for the Eastern BoP. It reflects the trends over the last 10 years that population has grown faster than expected and aligns with the experiences and expectations of the councils.	We have taken the Stats NZ High population projection as a medium population growth scenario for each district. This is based on previous trends of growth in the region being higher than anticipated in recent years and a general consensus that the area is likely to continue to see growth due to migration, seasonal workers and a retiring population.
High	We think this provides a reasonable high growth scenario for the region. It assumes the growth trends experienced over the last 10 years continue in a similar trend, with growth slowly declining over time.	We produced a high population projection by fitting a trend to the Stats NZ population estimates for each district from 2013-2020 to estimate the future population if that trend continued through to 2055. Note that this trend is not linear as each district already showed signs of slowing growth towards the end of the 2013-2020 growth period.

The medium/most likely projection is based on the Stats NZ High scenario. Stats NZ guidance states that while their medium projections across each district are consistent with the median *national* growth projections, it is up to individual users to determine what projections are most suitable for their purposes[5]. Given the evidence outlined earlier in this report, and discussions with each of these councils, we believe that the Stats NZ High projection is the most appropriate 'medium' scenario to be used for spatial planning and housing and business assessments in the Eastern BoP. We also note that ŌDC has developed an alternative high projection which projects the total new housing required in the district (instead of the net additional housing estimated by the projections in this report), and that they may prefer to use this for their spatial planning activities.

All population projections are shown for each district in Figure 12-Figure 14 and for the combined Eastern BoP in Figure 15-Figure 16. A table detailing the population projections for key years is also included in Table 5.

Whakatāne District

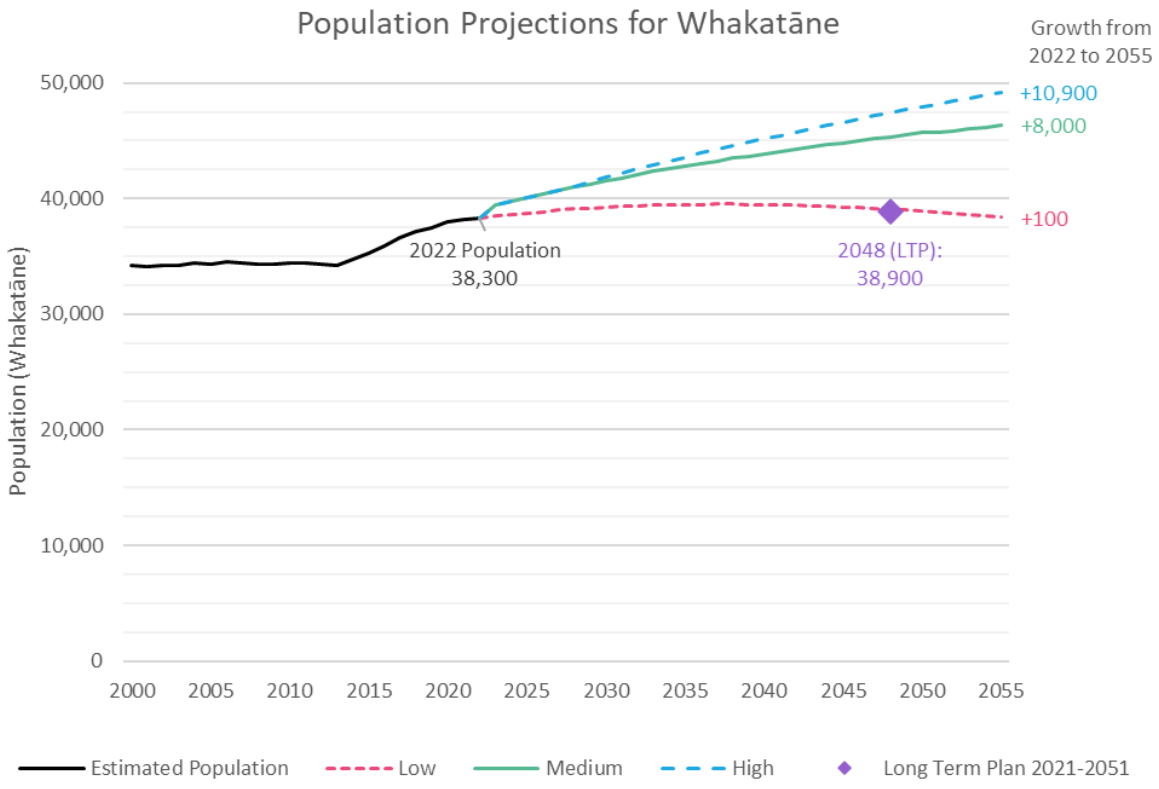


Figure 12 Population projections for Whakatāne

[5] https://www.stats.govt.nz/information-releases/subnational-population-projections-2018base2048-update/ (Retrieved 4 April 2023)

Ōpōtiki District

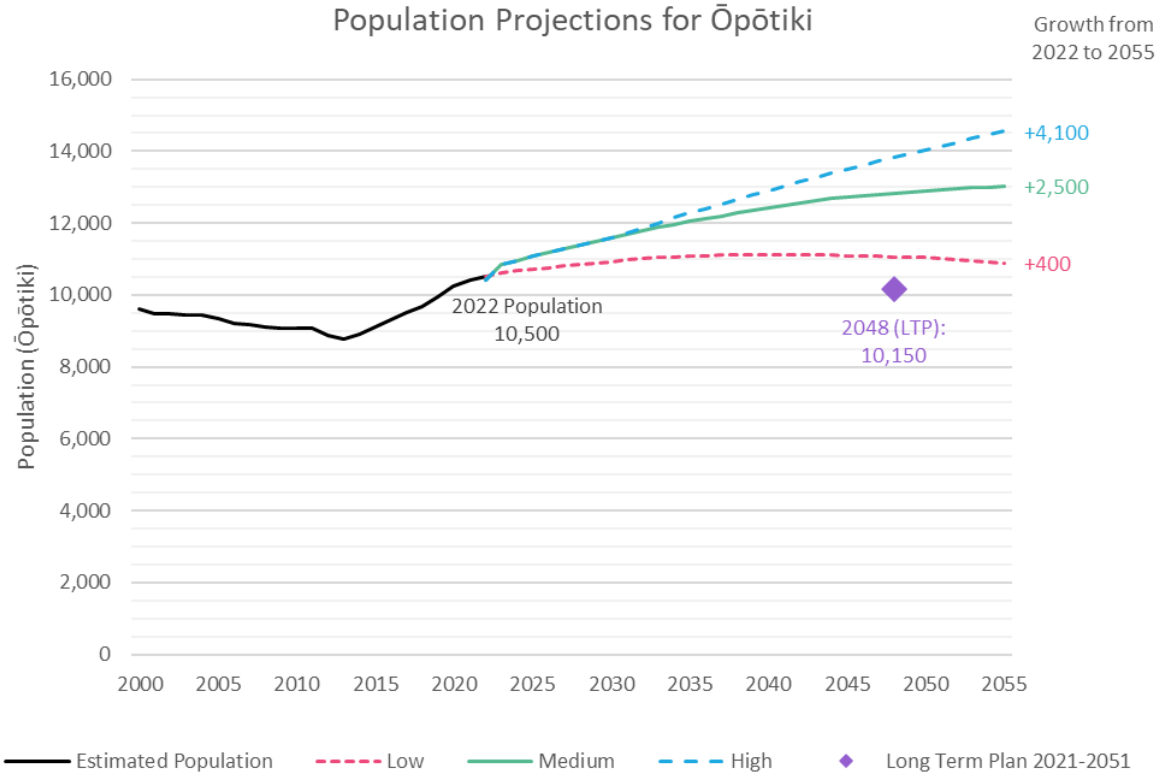


Figure 13 Population projections for Ōpōtiki

Kawerau District

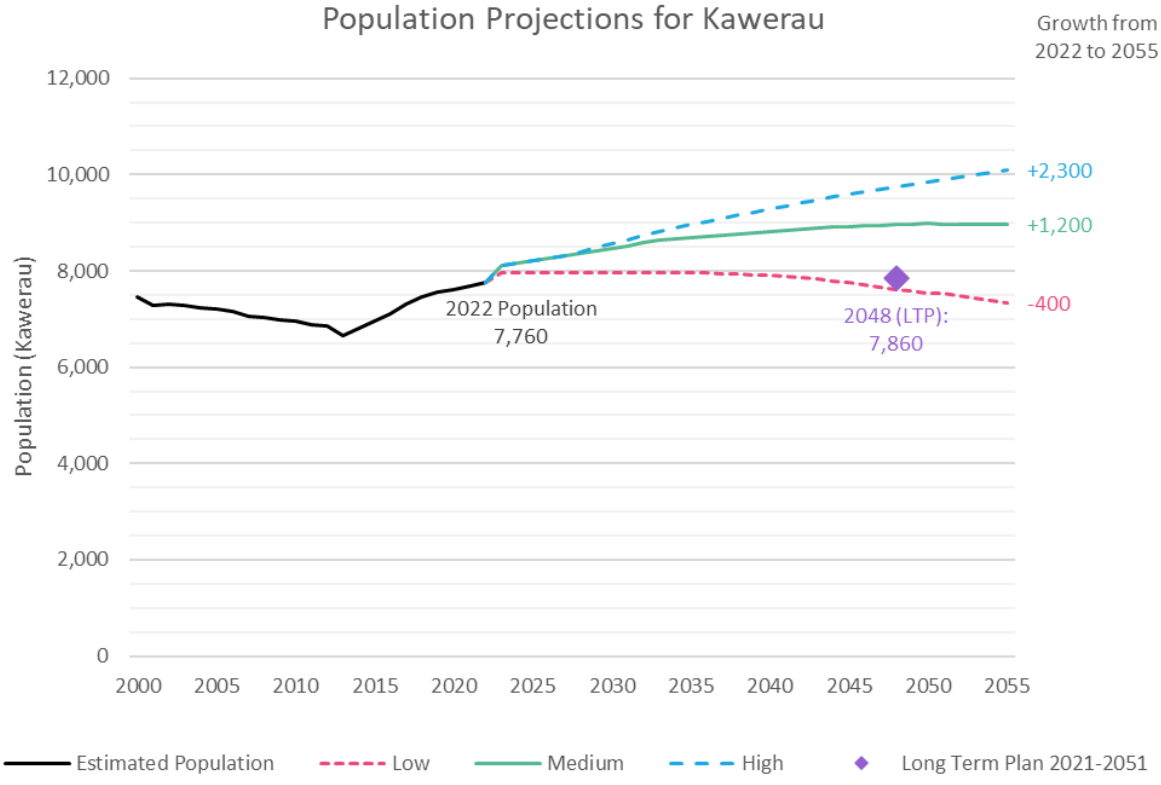


Figure 14 Population projections for Kawerau

Whole Eastern Bay of Plenty

Figure 15 shows the combined population projection for the whole Eastern Bay of Plenty Region. Figure 16 shows the relative population for each district using the Stats NZ High projection which is one of the assumed most likely projections for each district.

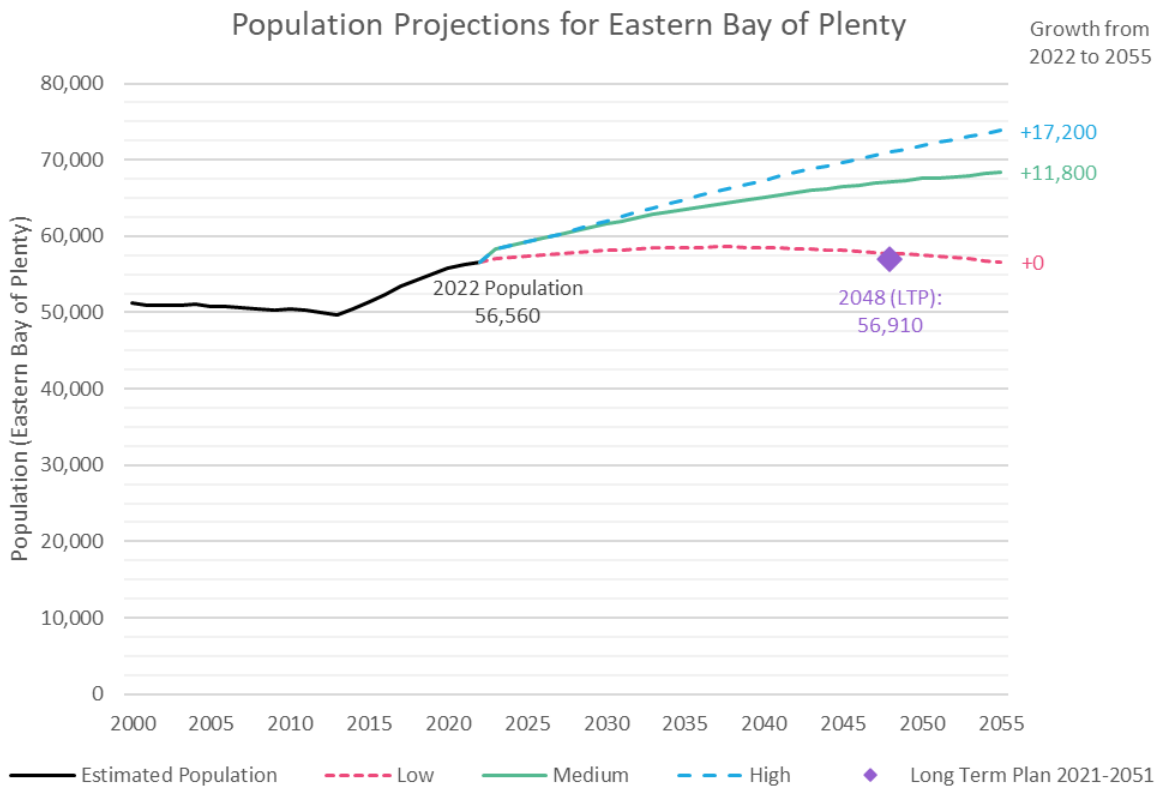


Figure 15 Population projections for the combined Eastern Bay of Plenty

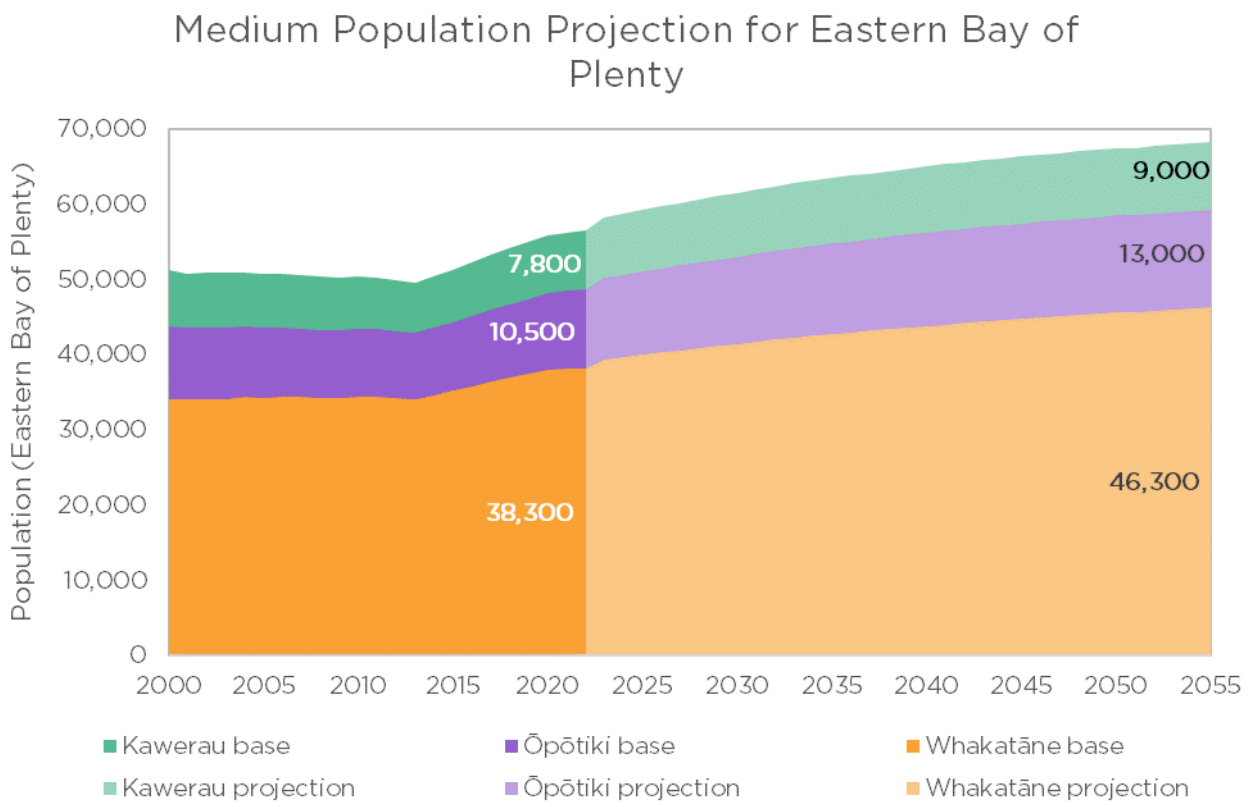


Figure 16 Population estimates and medium growth projections for Eastern Bay of Plenty, 2000 - 2055

Table 5 shows the detailed population estimates for each scenario and district for several key future years.

Table 5 Population projection scenarios for each district

District*	Short Term		Medium Term		Long Term			
	2022 (Base)	2026	2028	2033	2038	2043	2048	2053
Low								
Whakatāne	38,300	38,900	39,100	39,400	39,500	39,400	39,100	38,600
Ōpōtiki	10,500	10,800	10,900	11,100	11,100	11,100	11,100	11,000
Kawerau	7,800	8,000	8,000	8,000	7,900	7,800	7,600	7,400
Total	**56,600**	**57,600**	**57,900**	**58,500**	**58,600**	**58,300**	**57,800**	**57,000**
Medium								
Whakatāne	38,300	40,400	41,000	42,400	43,500	44,500	45,300	46,000
Ōpōtiki	10,400	11,200	11,400	11,900	12,300	12,600	12,800	13,000
Kawerau	7,800	8,300	8,400	8,600	8,800	8,900	9,000	9,000
Total	**56,500**	**59,800**	**60,700**	**62,900**	**64,500**	**66,000**	**67,100**	**68,000**
High								
Whakatāne	38,300	40,400	41,100	42,900	44,500	46,000	47,400	48,700
Ōpōtiki	10,400	11,200	11,400	12,000	12,700	13,300	13,800	14,300
Kawerau	7,800	8,300	8,400	8,800	9,200	9,500	9,800	10,000
Total	**56,500**	**59,800**	**60,800**	**63,700**	**66,400**	**68,800**	**71,000**	**73,000**

*all figures rounded to the nearest 100 residents

4.1.1 Projections by age and ethnicity

As described above, the medium population projection for each district is considered to be the most likely projection for the Eastern BoP. This projection is based on the Stats NZ High population projections for each district. Figure 17 shows the population projections by age bracket for the Māori and Non-Māori population, based on the Stats NZ High projections. This shows that:

- The Māori population is younger population than non-Māori and this is expected to continue to 2043.
- Both Māori and non-Māori populations are expected to age by 2043 compared to 2023, creating a more balanced 'age pyramid' than in 2023.
- The Māori population is nearly 50% of the total population now, and that is expected to continue through to 2043.

This means that the types of housing required in the Eastern BoP in the future will need to support a growing population and an ageing population. While the Māori population is expected to have an older population in the future, their young population is also expected to grow compared to currently.

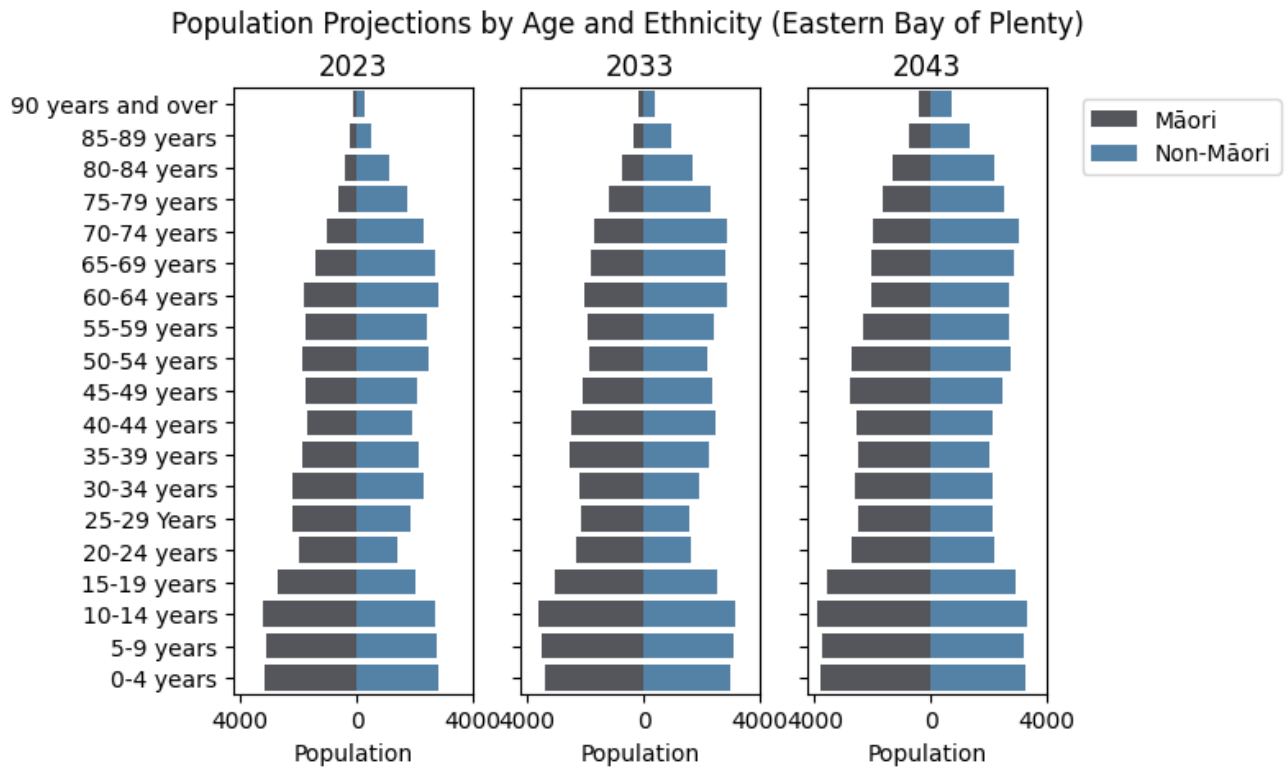


Figure 17 Population projections by age and ethnicity (medium projections, based on Stats NZ High)

4.1.2 Recognised Seasonal Employer (RSE) workers

Recognised Seasonal Employer (RSE) workers are not included in the population projections as they are temporary residents of the region. However, as they are residents for some part of the year (depending on what seasonal work they are doing), they may contribute to demand for housing in the region. There are only four RSEs in the Eastern BoP, which are:

- Sybton Horticulture Limited
- Riverlock Orchards Limited
- Coastal Kiwis Limited
- Tirohanga Fruit Company Limited

Although there is only a small number of RSEs in the region, this is not the only source of seasonal workers. New Zealand citizens, residents, and people on working visas may choose to take up seasonal work in the Eastern BoP with other organisations. We were not able to collect data on the size of the seasonal workforce for this report, but this could be useful to collect in the future.

4.2 Household projections

The population projections have been converted into high level household projections based on Stats NZ projections about families and households. Average household sizes (number of people per house) have been slowly declining over time in the Eastern BoP and across Aotearoa. The current average household size across the Eastern BoP is 2.6-2.7 people per household.

Stats NZ has projected how this is expected to change in the future for each territorial authority[6]. In Whakatāne, household sizes are projected to decrease from 2.7 in 2018 to 2.6 in 2043, while in Ōpōtiki they are expected to drop from 2.6 to 2.5 and in Kawerau from 2.7 to 2.5.

We have combined the population projections with average household sizes to produce a range of household projections for each district. The low population projections have been combined with the high household sizes to give a lower bound on the household needs, while the high population projections combined with the low household sizes to give an upper bound. The medium projection combines the medium population projection with the average expected household size of 2.6. These are net additional households compared to 2022 and are shown in Table 6**.**

Table 6 Projections for additional households required compared to 2022

District	Short Term		Medium Term		Long Term			
	2022 (Base)	2026	2028	2033	2038	2043	2048	2053
Low								
Whakatāne	0	210	300	420	450	400	290	120
Ōpōtiki	0	100	130	200	230	230	210	170
Kawerau	0	80	80	80	70	30	-50	-120
Total	**0**	**380**	**500**	**700**	**750**	**660**	**440**	**170**
Medium								
Whakatāne	0	790	1,030	1,560	1,990	2,370	2,710	2,970
Ōpōtiki	0	300	380	570	720	860	940	990
Kawerau	0	200	240	340	380	440	460	470
Total	**0**	**1,280**	**1,640**	**2,460**	**3,090**	**3,670**	**4,100**	**4,430**
High								
Whakatāne	0	820	1,100	1,840	2,500	3,100	3,640	4,150
Ōpōtiki	0	310	390	640	900	1,150	1,370	1,580
Kawerau	0	200	250	420	560	690	800	900
Total	**0**	**1,330**	**1,750**	**2,900**	**3,960**	**4,930**	**5,810**	**6,630**

* all figures rounded to the nearest 10 households

[6] https://www.stats.govt.nz/information-releases/family-and-household-projections-2018base-2043 (Retrieved 27 April 2023)

4.2.1 Projections by housing type

These household projections have been transformed into estimated housing growth by housing typology (out of standalone, attached, and apartment types) using similar assumptions to the previous ME report on housing demand for Whakatāne and Kawerau. In particular, we assume that 18% of housing growth in the short term is in attached and apartment dwellings, 20% is in those housing types in the medium term, and 23% in the long term. The estimated housing growth by typology, across the whole Eastern BoP is shown in Figure 18.

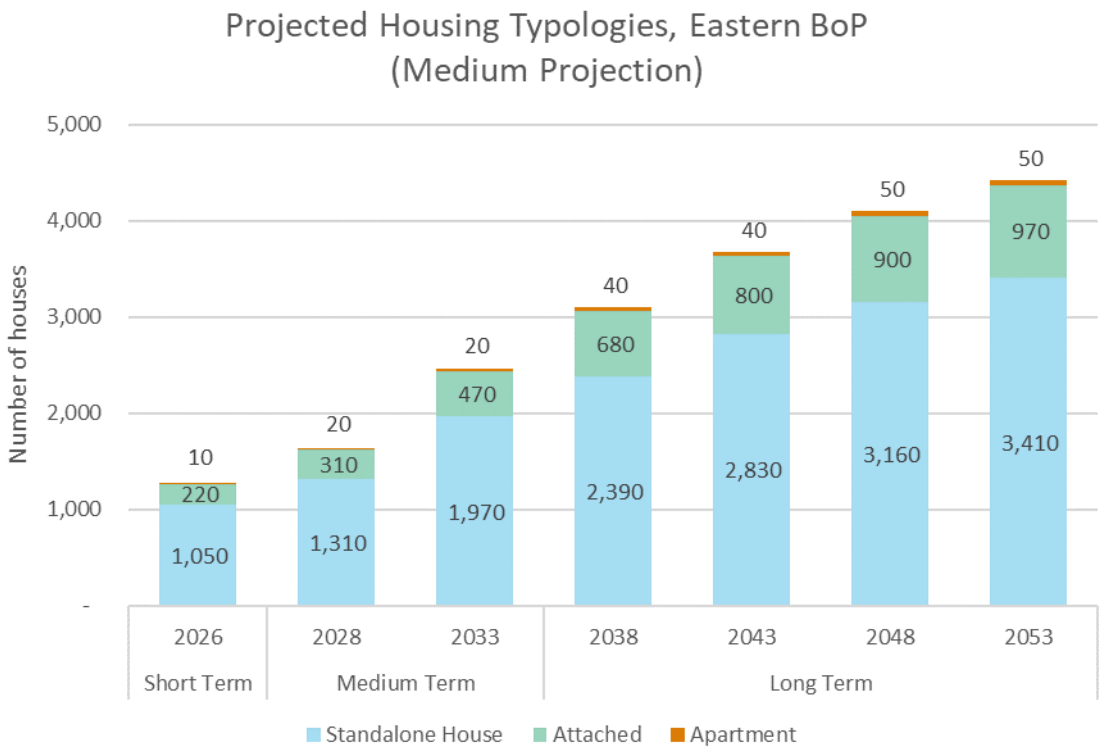


Figure 18 Household projections by typology, for the whole Eastern BoP (medium projection)

Table 7 describes how the growth in each of these housing typologies is likely to be distributed across the three districts.

Whakatāne will likely need to plan to accommodate all of the projected growth in apartment dwellings and most of the projected growth in attached dwellings in the Eastern BoP.

Ōpōtiki and Kawerau may see some apartment buildings in the long term, but not at the scale that they need to be planned for explicitly. However, Ōpōtiki and Kawerau will both need to consider how to accommodate attached dwellings in the medium and long term. This is likely to be particularly true for retirement and 'senior living' units which are likely to be in higher demand in the future, with the ageing population.

Table 7 Projected housing trends by district

Housing type	Whakatāne	Ōpōtiki	Kawerau
Standalone	Most housing will continue to be standalone houses. Over time, there will be more attached housing and apartments in all of the districts, but mostly in Whakatāne, as described below.		
Attached	Most new attached housing will be in Whakatāne.	Very few in the short term, but in the medium and long term, some attached housing will be developed in Ōpōtiki and Kawerau.	
Apartment	Most apartments in the district will be within the Whakatāne district.	Very few apartments.	Very few apartments.

4.3 Demand for residential land

The previous residential land assessment for Whakatāne assumed an average housing density of 14 houses per hectare. Based on analysis of current sites in residential parts of Whakatāne, this seems like a reasonable average assumption for the Eastern BoP.

For reference, Table 8 also shows the district plan rules for each of the residential zones in the Eastern BoP, including the minimum lot size for residential dwellings.

Table 8 Residential zoning rules across Eastern BoP

Zone	Maximum Building Coverage	Minimum Lot Size (m^2)
Whakatāne Urban Living Zone	50%	250 (standalone) 200 (attached)
Whakatāne Residential Zone	40%	350
Ōpōtiki Residential Zone	40%	400
Kawerau Residential Zone	35%	500

Table 9 shows the estimated additional residential land demand required to meet the projected housing growth based on an average 14 lots per hectare. Note that for the medium projections across the district, this is equivalent to:

- 91.6 hectares of residential land over the short term (2024-2026).
- 84.2 hectares of residential land over the medium term (2027-2033).
- 140.4 hectares of residential land over the long term (2034-2053).

Table 9 Additional demand for residential land (hectares) compared to 2022

District	Short Term		Medium Term		Long Term			
	2022 (Base)	2026	2028	2033	2038	2043	2048	2053
Low								
Whakatāne	0.0	14.8	21.2	29.9	32.3	32.3	32.3	32.3
Ōpōtiki	0.0	6.9	9.3	14.6	16.7	16.7	16.7	16.7
Kawerau	0.0	5.3	5.6	5.6	5.6	5.6	5.6	5.6
Total	**0.0**	**27.1**	**36.0**	**50.0**	**53.7**	**53.7**	**53.7**	**53.7**
Medium								
Whakatāne	0.0	56.5	73.6	111.3	142.3	169.5	193.4	212.1
Ōpōtiki	0.0	21.2	26.9	40.7	51.6	61.5	66.8	70.9
Kawerau	0.0	13.9	16.8	23.9	27.5	31.3	33.0	33.3
Total	**0.0**	**91.6**	**117.3**	**175.8**	**221.4**	**262.4**	**293.1**	**316.2**
High								
Whakatāne	0.0	58.7	78.9	131.4	178.5	221.1	260.3	296.6
Ōpōtiki	0.0	22.1	28.0	45.8	64.6	81.8	97.8	112.8
Kawerau	0.0	14.5	18.0	29.9	40.0	49.0	56.9	64.0
Total	**0.0**	**95.3**	**124.9**	**207.1**	**283.1**	**351.9**	**415.0**	**473.5**

4.4 Employment projections

Employment projections were estimated from population projections, and this was only done for the medium population growth projections, which are considered to be the most likely for the region. The following steps describe how the employment projections were developed (and apply a similar approach to the previous employment projections for Whakatāne in the RCG Report):

1. Estimate the natural growth in employment:
   a) Estimate the change in the working age population for each district for each year, based on the medium population projections and the Stats NZ medium projections for the share of population aged between 15-65.
   b) Estimate the additional workforce per year by multiplying the change in the working age population by the assumed labour force participation rate for that new workforce[7].
2. Add in the growth in employment due to Provincial Growth Fund (PGF) projects[8].

The resulting employment projections for each district are illustrated in Figure 1. This approach assumes that the natural growth in employment in each district will grow at the same rate as the working age population and that jobs created by PGF projects will reduce the unemployment in the region (which was 8-18% across these three districts in 2021, compared to the national average of 5%[9]). It is possible that the growth in the labour force might be distributed across the districts differently to what is assumed in these projections.

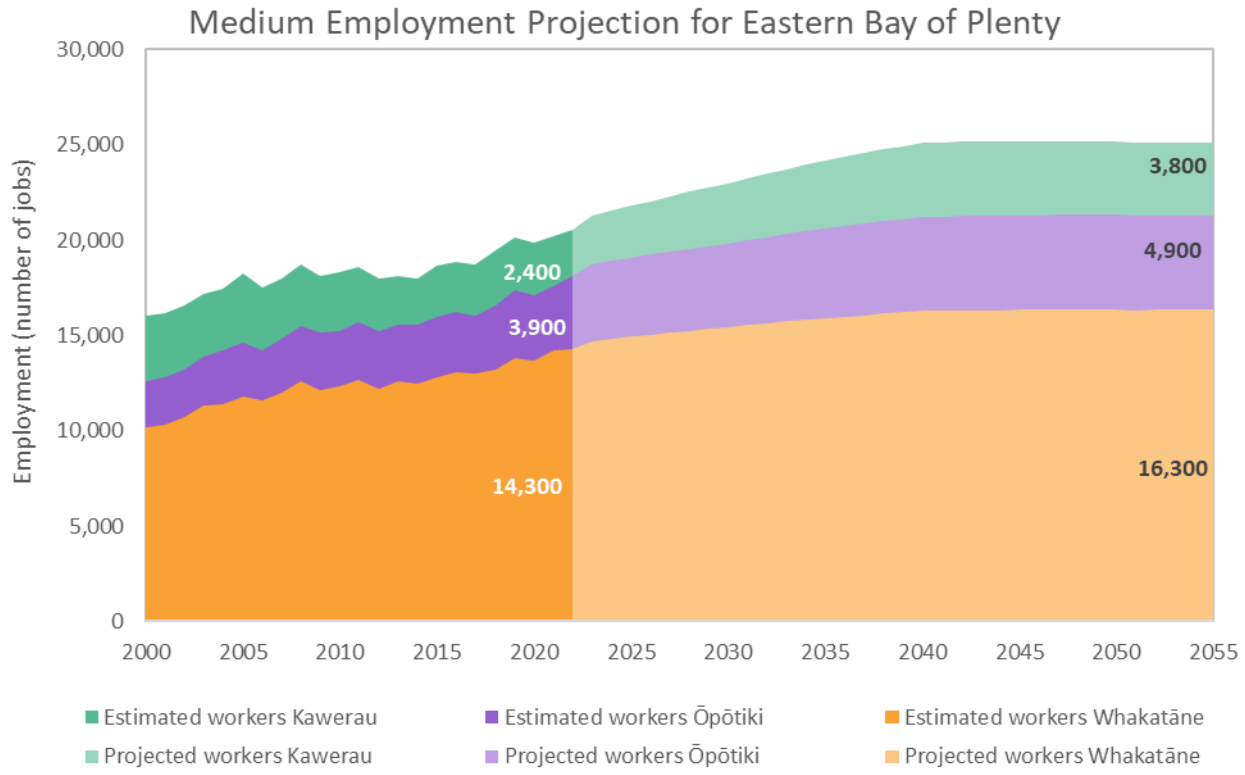


Figure 19 Employment projection for the Eastern BoP, 2000 - 2055

[7] We have assumed the labour force participation rate for the new workforce is 65%, the New Zealand average, which is similar to assumptions in the previous RCG Report. The resulting employment estimates are not very sensitive to this assumption.

[8] PGF projects are estimated to create 936 jobs in Whakatāne between 2020-2040, 1,484 jobs in Kawerau, and 730 jobs in Ōpōtiki (Whakatāne-Kawerau Spatial Plan Foundation Paper – Economic & Jobs, May 2022)

[9] https://www.mbie.govt.nz/dmsdocument/17895-bay-of-plenty-regional-labour-market-and-socio-economic-profile

The projected number of employees in each district is shown in Table 10, as well as the projected growth in the number of employees for each year since 2022. Overall, the total number of employees in the Eastern BoP is projected to grow by 8% over the next 30 years, which equates to an average growth of 0.3% growth in the labour force per year. This compares to the average growth in population of 0.6% per year. The reason the labour force growth is much slower than population growth is because of the ageing population of the Eastern BoP, which makes the share of the working age population smaller over time.

Table 10 Labour force in each district and growth in labour force since 2022

District	Short Term		Medium Term		Long Term			
	2022 (Base)	2026	2028	2033	2038	2043	2048	2053
Employee Projections (Medium)								
Whakatāne	14,300	15,000	15,300	15,700	16,100	16,300	16,400	16,300
Ōpōtiki	3,900	4,200	4,300	4,600	4,900	5,000	5,000	4,900
Kawerau	2,400	2,800	3,000	3,400	3,800	3,900	3,900	3,800
Total	**20,600**	**22,000**	**22,600**	**23,700**	**24,800**	**25,200**	**25,300**	**25,000**
Growth in Employees Since 2022 (Medium)								
Whakatāne	0	700	1,000	1,400	1,800	2,000	2,100	2,000
Ōpōtiki	0	300	400	700	1,000	1,100	1,100	1,000
Kawerau	0	400	600	1,000	1,400	1,500	1,500	1,400
Total	**0**	**1,400**	**2,000**	**3,100**	**4,200**	**4,600**	**4,700**	**4,400**

4.5 Business land demand

To translate employment growth into growth in demand for business land, we have to make some assumptions about the types of industries that will grow and how much land is required (per employee, on average), for each industry. For consistency, we have applied the same assumptions as the previous RCG Report, as outlined in Table 11.

Table 11 Assumed employment growth and land requirements by industry

Industry	Share of employment growth	Density of employees per hectare
Commerce	45%	80
Heavy industry	18%	20
Light industry	13%	35
Other (rural, home-based, or intensification of existing businesses)	24%	N/A

We note, however, that since the COVID-19 pandemic some industries, predominantly corporate ones, have seen a significant shift to more remote work and fewer days on site. Early in the pandemic, remote work was necessary to keep businesses operating while COVID-19 restrictions were in place. Even since the COVID-19 restrictions have been removed working from home has remained more common than pre-COVID-19. As a result, some commercial tenants are indicating they will require less commercial space going forward as fewer people are in the office at any one time.[10]

The permanence and magnitude of this shift remains uncertain. Compared with earlier in the pandemic more businesses are now looking to limit remote working eligibility and fewer businesses are stating they will require less commercial space going forward. Owing to the uncertainties in the remote working trend we have used the same assumptions as the previous RCG Report. This assumption should be reviewed as more data becomes available.

Table 12 shows the projected growth in business land demand required compared to 2022, across the Eastern BoP. This shows that the district needs an additional:

- 27.5 hectares of business land in the short term (2024-2026)
- 30.7 hectares of business land in the medium term (2027-2033)
- 27.1 hectares of business land in the long term (2034-2053)

Table 12 Projected growth in business land demand (hectares) in the Eastern BoP compared to 2022

District	Short Term		Medium Term		Long Term			
	2022 (Base)	2026	2028	2033	2038	2043	2048	2053
Business Land Demand (Medium)								
Industrial	0.0	19.1	25.1	40.4	53.3	59.0	59.1	59.1
Commercial	0.0	8.4	11.1	17.9	23.6	26.1	26.2	26.2
Total	**0.0**	**27.5**	**36.2**	**58.2**	**77.0**	**85.1**	**85.3**	**85.3**

These projections have not been separated by district because of how interdependent the economic markets for these three districts are. In other words, people can and do commute between these districts, so uptake of growth in one district is likely to impact uptake of growth in the other districts. An example of such relationships between the districts is the approval from WDC in 2020 to alter its boundary with KDC, adding 478 hectares to KDC, which could be zoned for industrial land uses in the future[11].

4.6 Summary of projections and future land demands

This section has detailed the updated population and employment projections for the Eastern BoP, including the estimated land required to support each of these types of growth. Table 13 shows the estimated population and employment (and the growth in each of these) over the short, medium and long term across the Eastern BoP. Key insights from this are:

- Population is expected to grow by 20% over the next 30 years.

[10] https://www.mrisoftware.com/nz/blog/research-shows-attitudes-future-of-work-continue-evolve-along-with-pandemic/

[11] Whakatāne-Kawerau Spatial Plan Foundation Paper – Economy & Jobs (May 2022)

- Employment is expected to grow by 21% over the next 30 years.

Table 13 Population and employment projection summary for the Eastern BoP, 2022 - 2053

Measure	Current (2022)	Short Term (2026)	Medium Term (2033)	Long Term (2053)
Population	56,500	59,800	62,900	68,000
Population growth since 2022	0	3,300	6,400	11,500
Employment	20,600	22,000	23,700	25,000
Employment growth since 2022	0	1,400	3,100	4,400

Table 14 outlines the projected land demand requirements across the Eastern BoP for different types of land use. The greatest individual requirement is for housing land uses, at 316 hectares over the next 30 years.

Table 14 Estimated additional land demand across the Eastern BoP for different purposes

Measure	Short Term (2023-2026)	Medium Term (2027-2033)	Long Term (2034-2053)	Total (2023-2053)
Housing	92 ha	84 ha	140 ha	316 ha
Industrial business land	19 ha	21 ha	19 ha	59 ha
Commercial business land	8 ha	9 ha	8 ha	26 ha
Total	119 ha	115 ha	167 ha	402 ha

5 Travel Patterns

In the RCG Report, commuting patterns in the Eastern BoP were analysed using data (previously) available online as the Commuter View[12] tool. The data in this tool were from the 2013 Census and looked at where people live and where they work. This was used to estimate flows between areas and provided a useful view of how much inter-district commuter movement happens in the Easter BoP. Unfortunately, this tool has now been removed from Stats NZ website and is no longer available for analysis.

MRC was able to obtain a copy of the data directly from Stats NZ to verify that we understood the data and that the calculations in the RCG Report were correct and showed an accurate picture of the commuting patterns in Eastern BoP. Table 15 is a reproduction of Figure 10.2 in the RCG Report detailing the commuting data. Unsurprisingly, this data shows that of the 11,481 people who commuted to work in Whakatāne, 10,131 of them live in Whakatāne. The numbers down the diagonal of the table show the number of people who live and work in the same district. The other cells show the number of commuters that live in one district and work in another. This data provides a useful, if high-level, look at the commuting flows in the Eastern BoP.

Table 15 Commuting patterns, 2013 Census

		People who work in				
		Whakatāne	Ōpōtiki	Kawerau	Other Areas	**Total**
People who live in	Whakatāne	10,131	228	900	789	**12,048**
	Ōpōtiki	189	2,430	15	96	**2,730**
	Kawerau	330	Confidential	1,056	102	**1,488**
	Other Areas	831	129	273	N/A	**1,233**
	Total	**11,481**	**2,787**	**2,244**	**987**	**17,499**

In theory, this data should be available for the 2018 Census and an updated table could be reproduced. However, Stats NZ has chosen not to make the data readily available at the district level, but instead created a web tool for data visualisation[13]. This tool, called Commuter Waka provides an interactive tool for determining where commuters begin and end their journey.

Unfortunately, the underlying data[14] is not appropriate for analysis at the district level. It is only available at the Statistical Area 2[15] (SA2). This has the unfortunate result of a lot of information being made confidential – particularly on the "thin" commuter routes.

Table 16 reveals that the number of commuters *within* districts, where data is unlikely to be made confidential at SA2 level, are largely consistent with the results from 2013. Numbers are slightly up in the WDC, ŌDC, and KDC areas. Between districts, however, the data becomes very unreliable, with large amounts of data made confidential and commuting trips unable to be estimated. However, given the consistency of the within-district numbers, it is reasonable to conclude that between district numbers may also be similar.

[12] https://www.stats.govt.nz/tools/commuter-view/

[13] https://commuter.waka.app/

[14] https://datafinder.stats.govt.nz/data/category/census/2018/commuter-view/

[15] https://www.stats.govt.nz/assets/Methods/Statistical-standard-for-geographic-areas-2023/Statistical-standard-for-geographic-areas-2023.pdf

Table 16 Commuting patterns, 2018 Census

		People who work in				
		Whakatāne	Ōpōtiki	Kawerau	Other Areas	**Total**
People who live in	Whakatāne	10,491	69	549	30	**11,139**
	Ōpōtiki	99	2,667	Confidential	Confidential	**2,766**
	Kawerau	216	Confidential	1,125	9	**1,350**
	Other Areas	Confidential	Confidential	45	N/A	**45**
	Total	**10,806**	**2,736**	**1,719**	**39**	**15,300**

Freight also moves around the Eastern BoP. The 2020 Bay of Plenty Regional Freight Flows Study[16] looks at freight flows into, out of, and within the wider BoP region. And while the study understandably focusses on Tauranga and the flows to the port, it discusses a few points relevant to the Eastern BoP.

In particular, it mentions several potential disruptors to freight movements in the Eastern BoP

- Growth of aquaculture in Ōpōtiki
- Increase in water bottling plants in the eastern bay
- Kawerau container terminal
- Increased horticulture

Aquaculture and horticulture combined were estimated to add approximately 20 trucks per day to the network while the Kawerau container terminal would remove up to 200 trucks per day. If the application to expand the Otakiri Water Bottling plant is approved, it could add up to 200 trucks per day at peak times. Most of this induced traffic would be leaving the Eastern BoP and heading towards Tauranga.

The report also shows that the WDC/KDC area produces the highest share of logs, the highest share of timber products, and the second highest share of milk in the BoP. If the market and/or production of any of these good were to change meaningfully, it could impact the freight patterns in the Eastern BoP.

[16] https://atlas.boprc.govt.nz/api/v1/edms/document/A3504887/content

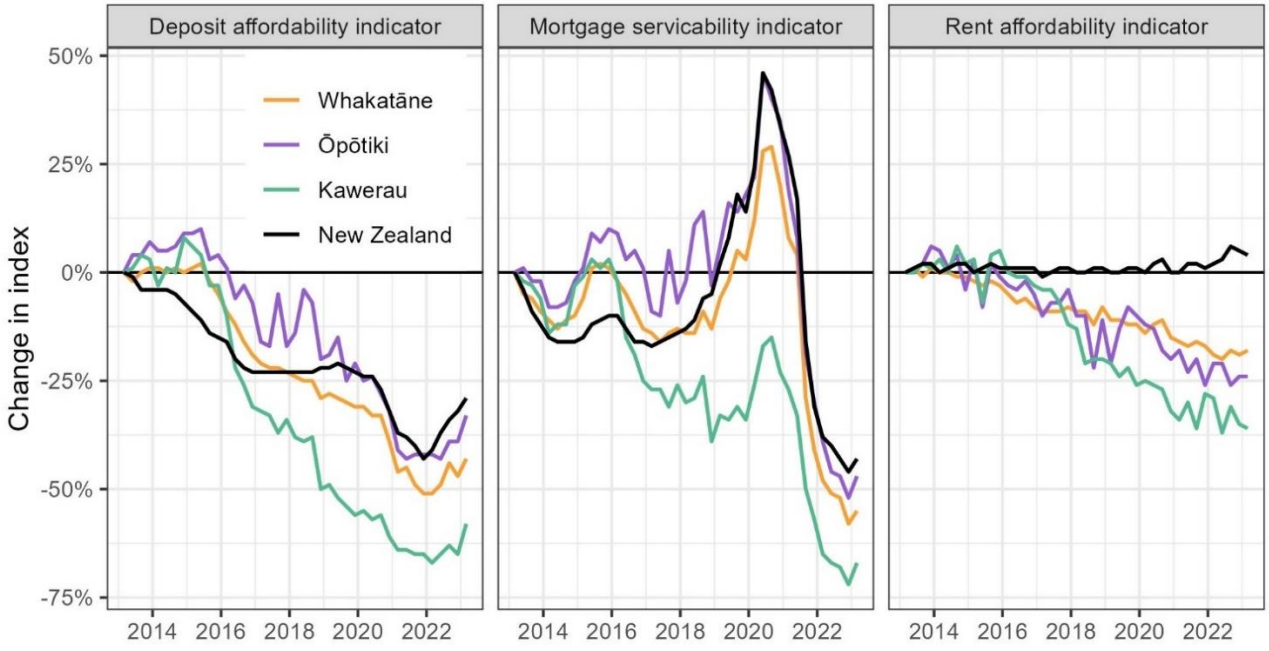
6 Economic Trends

This section examines economics trends in the Eastern BoP over recent years.

6.1 Affordability of housing

The biggest issue in Aotearoa for at least the last decade (and probably before that as well) is the unaffordable price of housing. It is frequently front-page news and every month when the Real Estate Institute of New Zealand releases their house price data, there is a flurry of news and analysis on the topic.

There are several metrics – some better than others – for measuring the affordability of housing in New Zealand. Figure 20 shows three metrics provided by the Ministry of Housing and Urban Development. In all cases, the indicator is indexed to 2013.



Source: Ministry of Housing and Urban Development; Index year = 2013

Figure 20 Deposit, mortgage, and rent affordability metrics by district

Definitions of the indicators are as follows[17]:

> *The **Deposit Affordability** Index is a summary measure of changes in house sales prices compared with changes in income. Positive changes in the affordability index imply greater affordability as incomes are increasing faster than house sales prices; negative changes imply declining affordability as house sales prices are rising faster than incomes.*
>
> *The **Mortgage Affordability** Index is a summary measure of changes in the purchasing power of mortgage interest payments (an interest price index) compared with changes in income. Positive changes in the affordability index imply greater affordability as incomes are increasing faster than the interest price index; negative changes imply declining affordability as the interest price index is rising faster than incomes.*

[17] https://www.hud.govt.nz/assets/Uploads/Documents/Methods-Nov-2022.pdf

> *The **Rental Affordability** Index is a summary measure of changes in rental prices compared with changes in income. Positive changes in the affordability index imply greater affordability as incomes are increasing faster than rent prices; negative changes imply declining affordability as rent prices are rising faster than incomes.*

There are some notable patterns across these affordability metrics.

Deposit affordability is down for the entire country over the past ten years which indicates that house sales prices are rising faster than incomes. However, for each of the three districts in the Eastern BoP, the deposit affordability index is below the national average. This means that in WDC, ŌDC, and KDC, house prices have gone up even faster compared to incomes than in other parts of the country. This means that saving for a deposit in Eastern BoP has become even harder over time when compared against the national average. Deposit affordability has deteriorated the most in Kawerau, followed by Whakatāne, then Ōpōtiki. But, again, in all cases, has declined more than the national average.

For mortgage serviceability, the patterns tend to be more clustered, as interest rates are set nationally (or, really, globally). This is evident as the indicator has the same pattern, though to different scales, for each district. In fact, WDC and ŌDC's indicators very closely track the national indicator for mortgage serviceability. KDC is the outlier here where the pattern has the same shape, but affordability has deteriorated far more than in other areas. In all areas, but especially KDC, mortgage serviceability is the least affordable it has been in the last ten years.

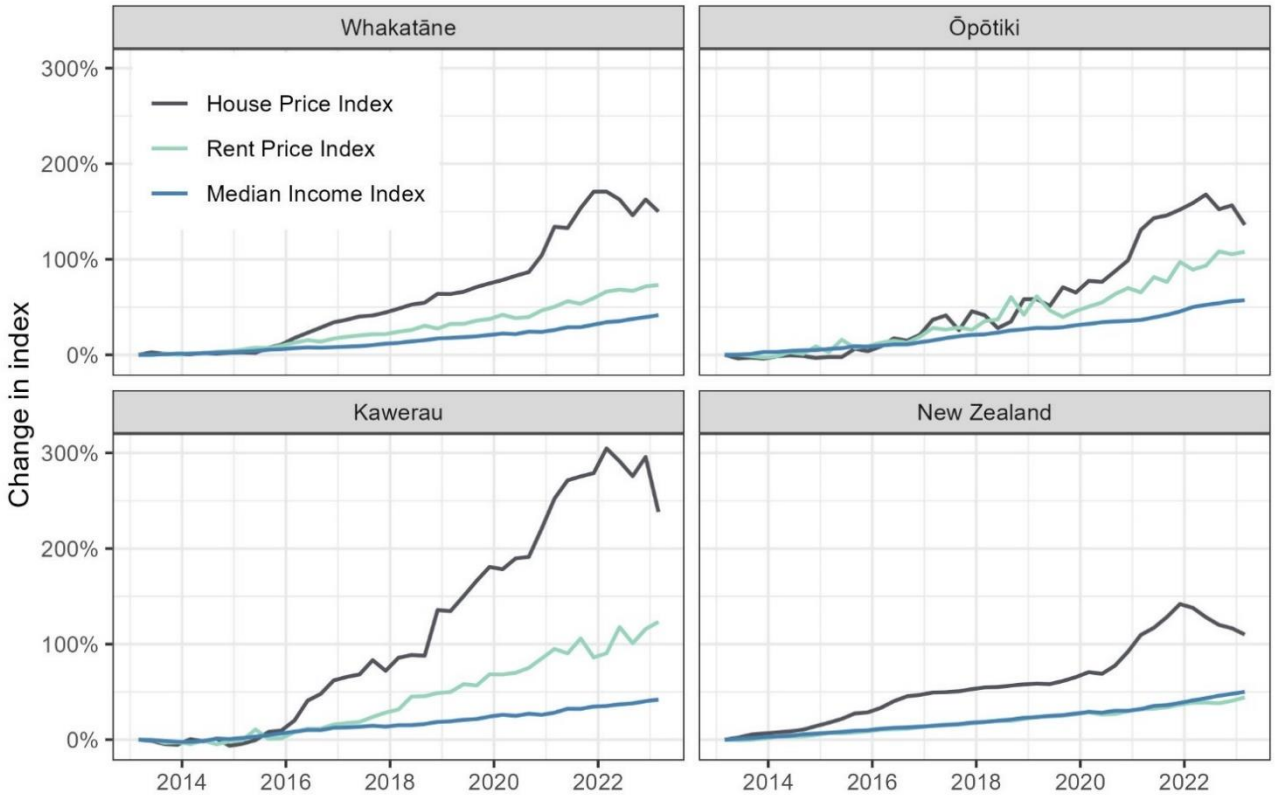
Looking to the rent affordability indicator, we see that nation-wide, on average, rents are slightly *more* affordable than they were ten years ago. However, this is not the case for any of the three districts in the Eastern BoP. Rental affordability has declined the most in Kawerau, followed by Ōpōtiki, then Whakatāne. While, on average in Aotearoa, rents have increased slightly slower than incomes (and are consequently more affordable), the opposite is true in the Eastern BoP.

Some simpler metrics for gauging housing affordability are shown in Figure 21. This chart plots how house prices, rents, and median incomes have changed over the past ten years for the three Eastern BoP districts and all New Zealand.

Here we see that, on average across New Zealand, even though house prices have gone up by more than 100% in the past decade, rents have essentially moved in lockstep with median incomes. This corroborates what was seen in the rent affordability indicator in Figure 20. However, for WDC, ŌDC, and KDC, both rental prices and house prices have increased much quicker than median incomes. In Kawerau, this was quite pronounced as house prices were up some 300% from 2013 to 2022, while median incomes were up just under 50%.

The house price increases were less severe In WDC and ŌDC, but still well above the national average. And while rents have gone up less than house purchase prices over the past decade, they have still gone up much faster than median incomes – resulting in the deterioration in rent affordability over that time.

In summary, it does not matter which metric is used, housing affordability has decreased significantly over the past decade. This is true for home buyers across the whole country, but especially in the Eastern BoP where prices have gone up more than average. And while rental affordability has actually improved nationally, it has significantly degraded in the Eastern BoP over the same period.



Source: Ministry of Housing and Urban Development; index year = 2013

Figure 21 House price, rent price, and income index by district

6.2 Spending data

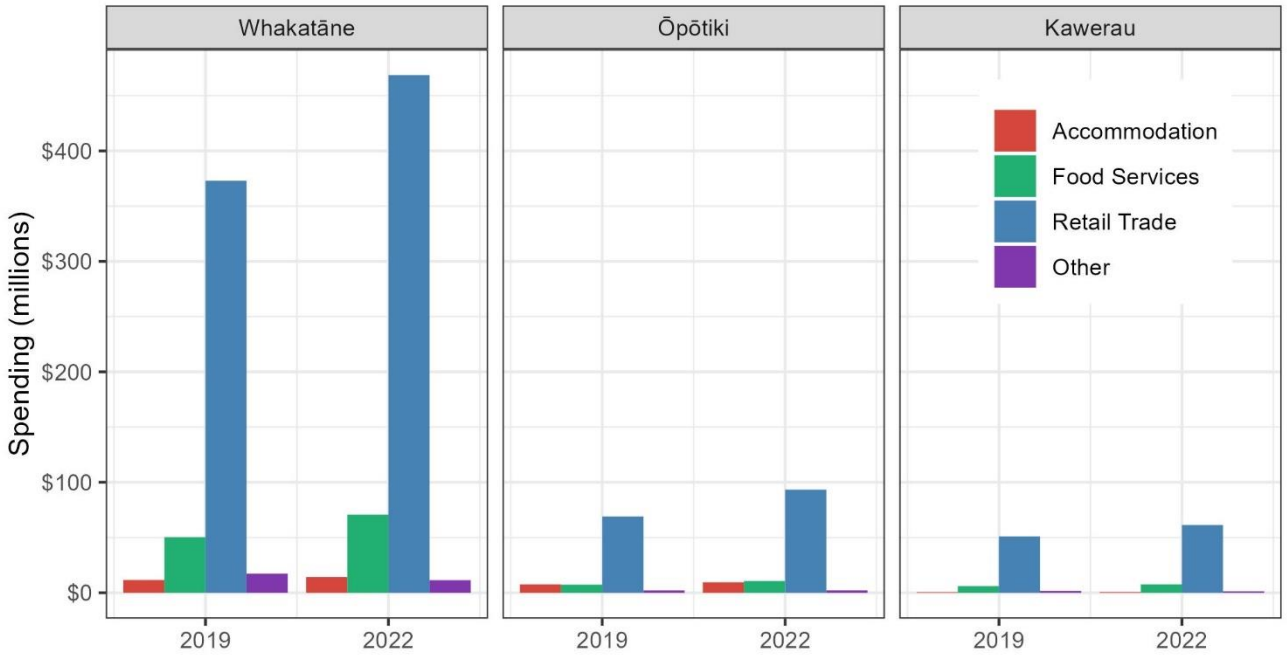
Marketview[18] card spending data was procured to look at spending patterns across the Eastern BoP. Two calendar years of data were available – 2019 (the last pre-pandemic year) and 2022. Consumer spending data was split into four categories – Accommodation; Cafes, Restaurants, Bars & Takeaways; Retail Trade; and Rest of Consumer Spending. Appendix C contains the mapping of subcategories (e.g., Furniture Retailing, Housewares Retailing, Takeaways) to the broader categories analysed.

The data looks at spending flows between Whakatane, Ōpōtiki, and Kawerau as well as the Rest of New Zealand. Spending is also categorised by the billing address associated with the card; cardholders are defined as being from Whakatane, Ōpōtiki, Kawerau, other domestic, or international visitors.

Figure 22 shows the consumer card spending by broad category by location of the merchant for both 2019 and 2022. That is, it shows where the spending takes place regardless of where the spender comes from. Some obvious patterns emerge. Whakatāne unsurprisingly has the highest level of spending overall. In general, spending is highest on retail trade, followed by food services, accommodation, and other. This is consistent between the two years.

In all three districts, spending is up in all categories (except "other") and overall spending in the regions has also increased significantly over the time period. Table 17 shows the total consumer spending in each district and the rest of the country for both years. Total spending is up significantly more in Eastern BoP than elsewhere in the country.

[18] https://www.marketview.co.nz/



Source: Marketview

Figure 22 Consumer card spending by location of merchant, 2019 and 2022

In terms of visitor spending, we have examined the spending by cards tagged as having a foreign billing address. For the rest of New Zealand, foreign card spending was down 40% between 2019 and 2022. Foreign card spending in the Eastern BoP was also down, but not nearly as much, with Whakatāne down approximately 10%, Ōpōtiki down 13% and Kawerau actually *up* almost 10%. While the share of international spending in the Eastern BoP is small, it does appear resilient to the pandemic-induced tourism downturn.

Table 17 Consumer card spending in each district (including intn'l visitors), 2019 and 2022 ($m)

Area	2019	2022	Change
Whakatāne	452	565	25.0%
Ōpōtiki	86.3	116	34.4%
Kawerau	59.4	71	19.5%
Rest of New Zealand	64,571	72,390	12.1%

Source: Marketview

Table 18 International card spending in each district, 2019 and 2022 ($m)

Area	2019	2022	Change
Whakatāne	8.1	7.2	-10.3%
Ōpōtiki	1.5	1.3	-13.2%
Kawerau	1.8	2.0	9.6%
Rest of New Zealand	3,252	1,950	-40.0%

Source: Marketview

Lastly, we examine the inter- and intra-district spending to see how this has changed through time. Table 19 shows the matrix of domestic consumer card spending for 2019, 2022, and the change between the years.

The table is read by choosing a row in the "people who live in" column then going across to the "spend money in" cells. For instance, for 2019, the table shows that people who live in Kawerau spent $23.1 million in Whakatāne, $0.1 million in Ōpōtiki, and $63 million in Kawerau. They also spent $17.5 million in the rest of the country, for a total spending of $103.8 million. As a note, the "people who live in the rest of NZ and spend money in the rest of NZ" has been intentionally left blank as it is irrelevant to the Eastern BoP.

Table 19 shows that total domestic consumer card spending in the Eastern BoP increased by nearly $185 million – or roughly 26% between 2019 and 2022. One curious result from the data analysis shows that people who live in Ōpōtiki spent $26.1 million more in 2022 than in 2019, while people who live in the rest of the country spent $24.3 million *less*. This is almost certainly a quirk of the data as the sum of the two figures shows the expected pattern. We suspect that the aggregate number is correct and that the data for people who live in Ōpōtiki in 2019 is mis-categorised[19].

[19] The 2019 data shows that people who live in Ōpōtiki spent only $3 million in Ōpōtiki while spending $24 million in Whakatāne. At the same time, according to the 2019 data, people from the rest of New Zealand spent $53 million in Ōpōtiki which is only a bit less than was spent in Whakatāne (despite Whakatāne being the retail hub of the Eastern BoP). This seems to indicate that people who live in Ōpōtiki were being misclassified as living in the Rest of New Zealand. In contrast the 2022 data shows that people who live in Ōpōtiki spent an amount in Ōpōtiki that is in line with what would be expected. The amount spent in each region increased (in aggregate) in reasonable and expected ways. All of this indicates that in the 2019 dataset, people who live in Ōpōtiki were likely misclassified as living in the rest of New Zealand. But this was fixed for the 2022 data.

Table 19 Domestic consumer card spending by origin of spender, by district, 2019 and 2022 ($m)

2019		Spend money in				
		Whakatāne	Ōpōtiki	Kawerau	Rest of NZ	**Total**
People who live in	Whakatāne	327.5	1.4	4.5	95.5	**428.9**
	Ōpōtiki	24.0	3.0	0.4	21.3	**48.8**
	Kawerau	23.1	0.1	63.0	17.5	**103.8**
	Rest of NZ	69.4	53.0	16.8		**139.3**
	Total	**444.1**	**57.6**	**84.8**	**134.3**	**720.7**

2022		Spend money in				
		Whakatāne	Ōpōtiki	Kawerau	Rest of NZ	**Total**
People who live in	Whakatāne	399.7	10.8	6.7	120.0	**537.3**
	Ōpōtiki	30.2	29.2	0.5	24.3	**84.3**
	Kawerau	31.0	0.2	84.2	19.8	**135.3**
	Rest of NZ	96.8	28.7	23.0		**148.6**
	Total	**557.8**	**69.0**	**114.4**	**164.2**	**905.4**

Change from 2019 to 2022		Spend money in				
		Whakatāne	Ōpōtiki	Kawerau	Rest of NZ	**Total**
People who live in	Whakatāne	72.2	9.5	2.2	24.5	**108.4**
	Ōpōtiki	6.2	26.1	0.1	3.1	**35.5**
	Kawerau	7.9	0.1	21.2	2.3	**31.5**
	Rest of NZ	27.4	-24.3	6.2		**9.3**
	Total	**113.8**	**11.4**	**29.7**	**29.9**	**184.7**
	(% change)	(26%)	(20%)	(35%)	(22%)	(26%)

6.3 Key business industries

Figure 23 shows the share of employees by broad sector for each of the Eastern BoP districts and for New Zealand as a whole.

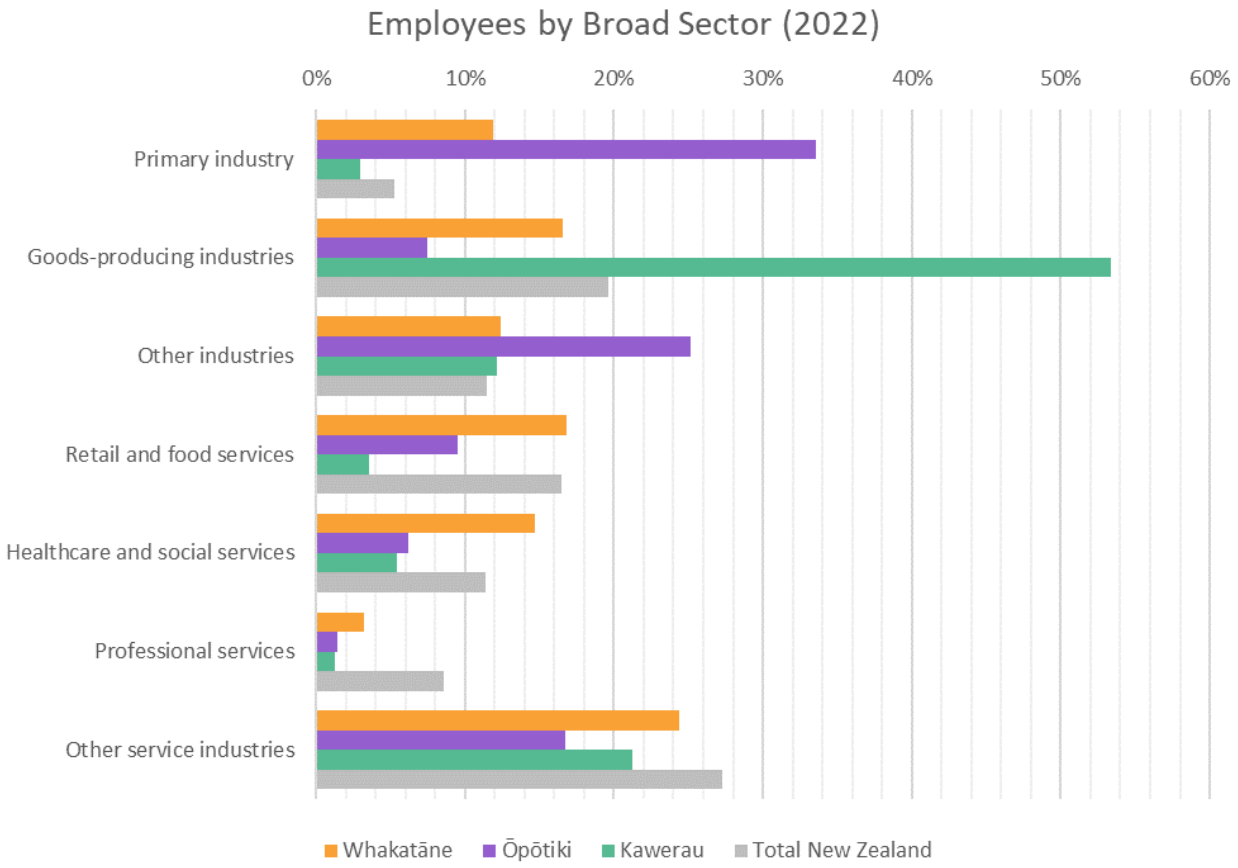


Figure 23 Number of employees by broad sector for the Eastern BoP districts, and New Zealand[20]

The main industries in the Eastern BoP are very different to the rest of the country. Some key observations about the employment by broad sector in the Eastern BoP are:

- Primary industry makes up a much greater share of the jobs in both Whakatāne and Ōpōtiki than the national average.
- Most of the jobs in Kawerau are in goods-producing industries (53%).
- Most of the jobs in Ōpōtiki are in either primary industries or 'other' industries (59%)
- Whakatāne is generally closer to the national averages for each broad sector than either Ōpōtiki or Kawerau, with the key differences in Whakatāne being a much higher share of jobs in primary industries and a much lower share in professional services.
- Although Whakatāne has a higher share of jobs in healthcare services and in retail and food services, this is likely due to these services meeting the needs of residents in Kawerau and Ōpōtiki as well as Whakatāne. This is also seen in the spending data in Table 19.

[20] Source: https://rep.infometrics.co.nz/whakatane-district/economy/structure?compare=bay-of-plenty-region

6.4 Employment share and trends by industry and trends

Statistics New Zealand further breaks down employment share of broad industry sectors into finer grained industries using the Australian and New Zealand Standard Industrial Classifications (ANZSIC). We have analysed this data for 2022 to compare against the New Zealand average and to understand trends in employment since 2013.

6.4.1 Whakatāne

Figure 24 shows the share of employment in Whakatāne by ANZSIC industry for 2022.

In Whakatāne the industries with the highest shares of employment are education and training (12%), retail trade (11%), agriculture (7%), medical and other health care services (7%) and personal and other services (6%).

Compared to the New Zealand average, Whakatāne has a relatively higher share of the population employed in the following industries:

- Agriculture, agriculture, forestry and fishing support services has 4% employment compared to 1% nationally
- Personal and other services has 6% employment compared to 2% nationally
- Medical and other health care services has 7% employment compared to 4% nationally
- Electricity, gas, water and waste services has 2% employment compared to 1% nationally
- Education and training has 12% employment share compared to 8% nationally

Whakatāne has relatively lower employment than the New Zealand average in the industries of professional, scientific and technical services, other manufacturing, and wholesale trade.

By comparing the 2022 employment information to the same information from 2013 we can understand trends in the share of employment by industry for Whakatāne. Growth is reported in percentage points (pp). Employment share has grown the most in personal and other services (3.2pp), agriculture, forestry and fishing support services (1.7pp), construction services (1.4pp), and medical and other health care services (1.4pp). Employment share has decreased the most in agriculture (1.7pp), education and training (1.2pp), and retail trade (1.1pp). Note, that some of the changes in employment share can come from recategorizing of the same work type under a different category. For example, some of the 1.7pp increase in agriculture, forestry and fishing support services employment share could come from the 1.7pp decrease in the employment share for agriculture.

A full graph on the changes in industry employment share can be found in Appendix D.

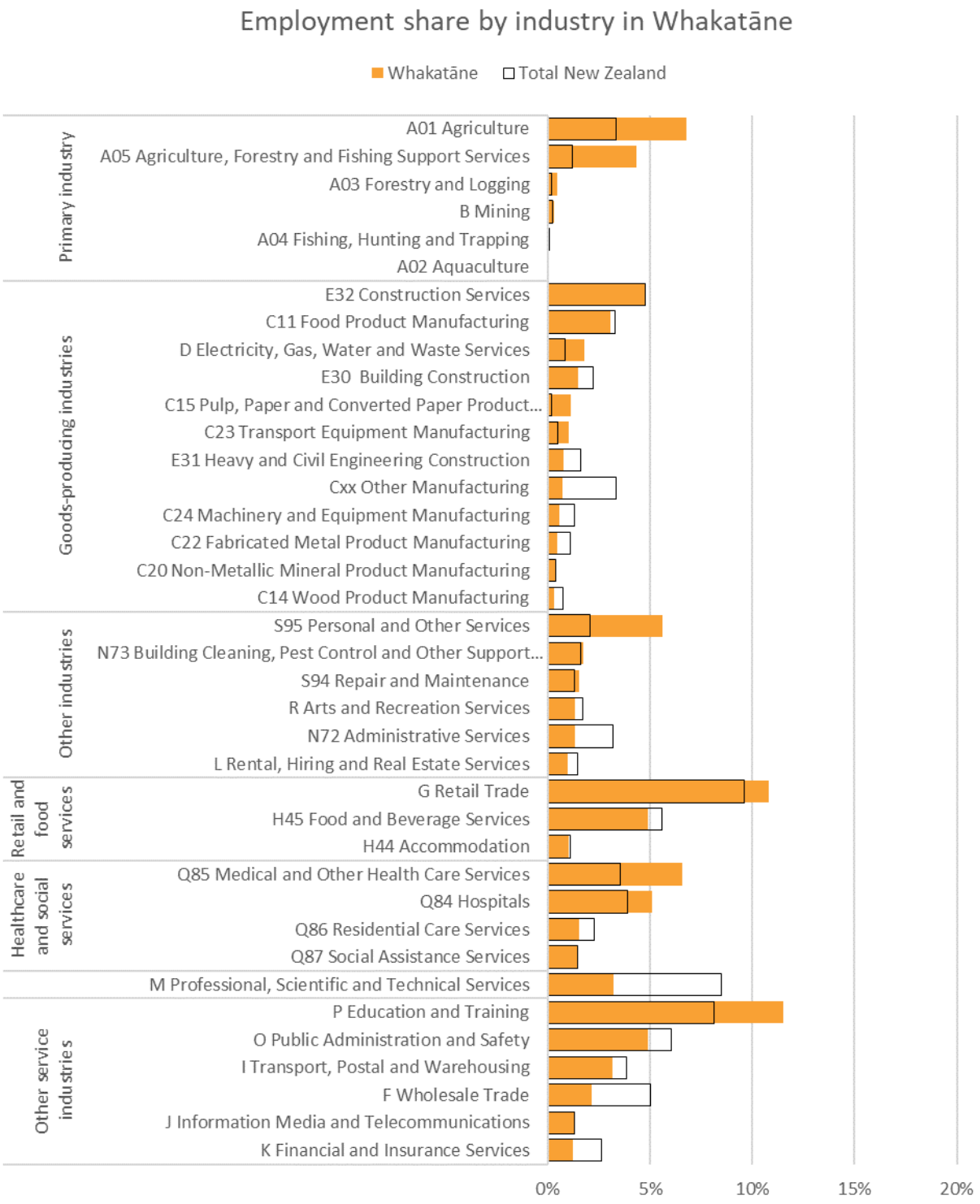


Figure 24 ANZSIC industries in Whakatāne with the highest employment shares, 2022

6.4.2 Ōpōtiki

Figure 24 shows the share of employment in Ōpōtiki for 2022 by ANZSIC industry.

In Ōpōtiki the following are the most common employment industries which are also vastly different from the New Zealand totals:

- Building cleaning, pest control and other support services has 20% employment share compared with 2% nationally
- Agriculture has 17% employment share compared with 3% nationally
- Agriculture, forestry and fishing support services has 12% employment share compared to 1% nationally

While not one of the highest employment share industries, aquaculture has 4% of the employment share in Ōpōtiki is unique when compared to New Zealand as a whole where employment in this industry is 0.04%.

Compared to the New Zealand total employment share, Ōpōtiki has much lower employment share in several industries, especially those in the goods-producing sector where most industries have 20 or fewer employees. Other industries with lower than the national employment rate include professional, scientific and technical services, retail trade, and construction services.

By comparing this 2022 employment information to the same information from 2013 we can understand trends in the share of employment by industry for Ōpōtiki. Employment share has grown the most in building cleaning, pest control, and other support services (11.6pp) and aquaculture (3.6pp). The largest decreases in employment share have been observed in education and training (3.6pp), forestry and logging (1.9pp), and retail trade (1.6pp).

A full graph on the changes in industry employment share can be found in Appendix D.

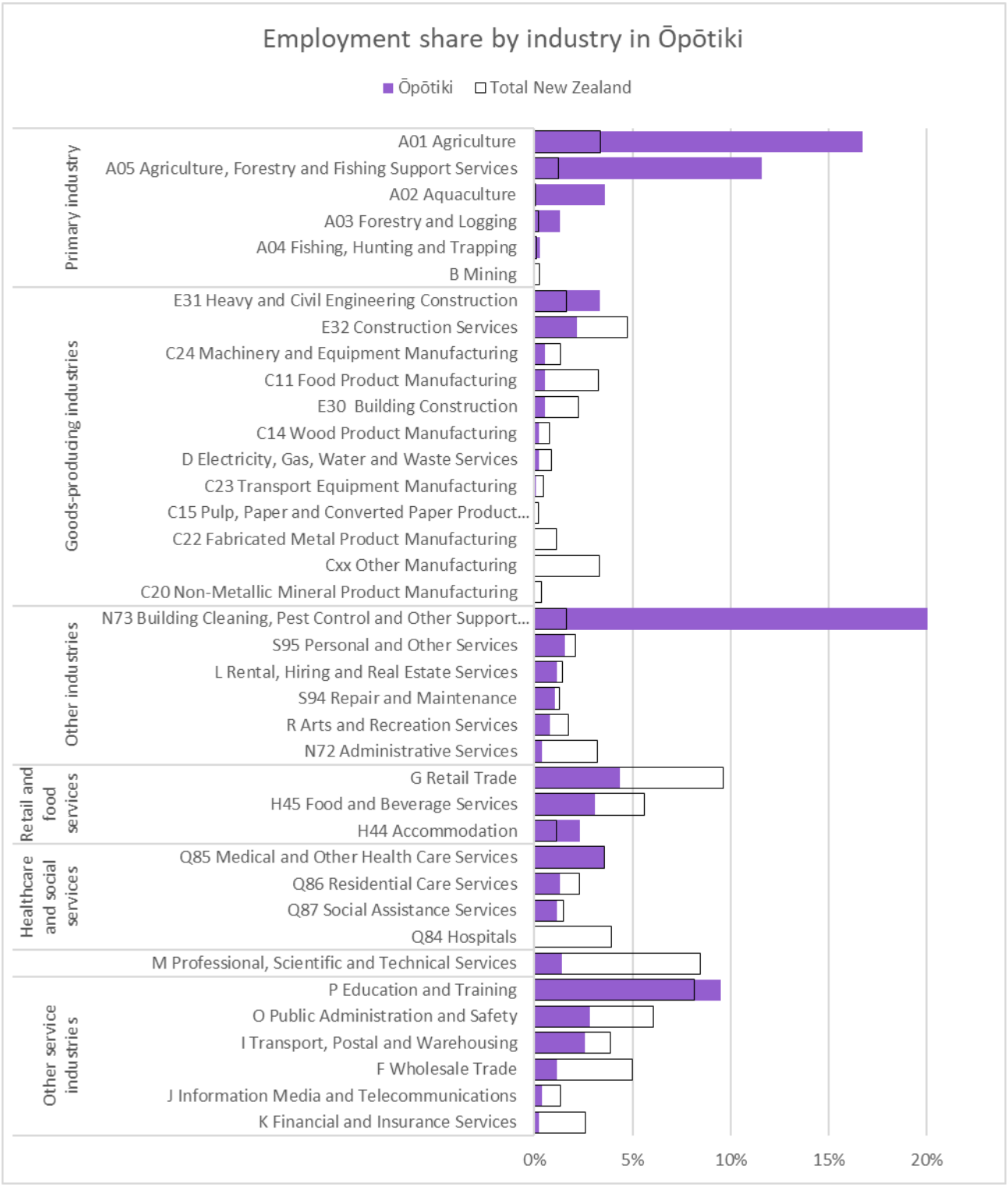


Figure 25 ANZSIC industries in Ōpōtiki with the highest employment shares, 2022

6.4.3 Kawerau

Figure 26 shows the share of employment in Kawerau for 2022 by ANZSIC industry.

In Kawerau there are a few industries which represent a strong percentage of the total employment share owing to the concentration of wood and paper processing facilities in the area. The industries with the highest employment shares are:

- Pulp, paper and converted paper product manufacturing at 20% compared with 0.2% nationally
- Wood product manufacturing at 15% compared with 0.8% nationally
- Education and training at 9% which is similar to the national total of 8%

Some of the industries that have the highest national employment share are significantly lower in Kawerau, those include retail trade, professional, scientific and technical services, and wholesale trade.

By comparing this 2022 employment information to the same information from 2013 we can understand trends in the share of employment by industry for Kawerau. Employment share has increased the most in wood product manufacturing (6.2pp), fabricated metal product manufacturing (1.7pp), and building cleaning, pest control and other support services (1.5pp). Kawerau has also seen decreases in some industries, with the largest decreases in machinery and equipment manufacturing (4.3pp), pulp, paper and converted paper product manufacturing (3.7pp) and heavy and civil engineering construction (1.6pp).

A full graph on the changes in industry employment share can be found in Appendix D.

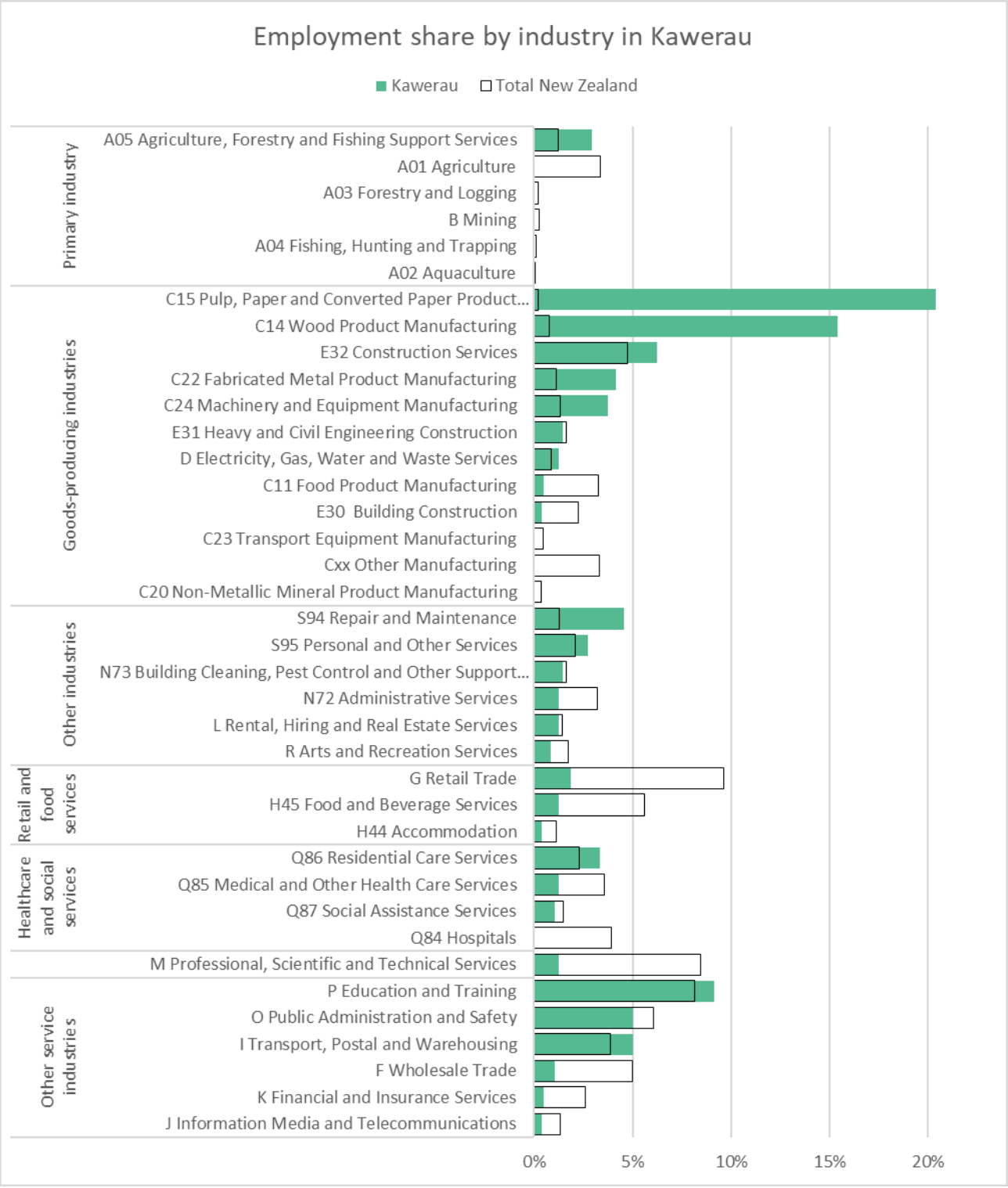


Figure 26 ANZSIC industries in Kawerau with the highest employment shares, 2022

Figure *27* shows the density of jobs across the Eastern BoP. This shows the key employment nodes across this area being Whakatāne, Ōpōtiki, Kawerau and Edgecumbe.

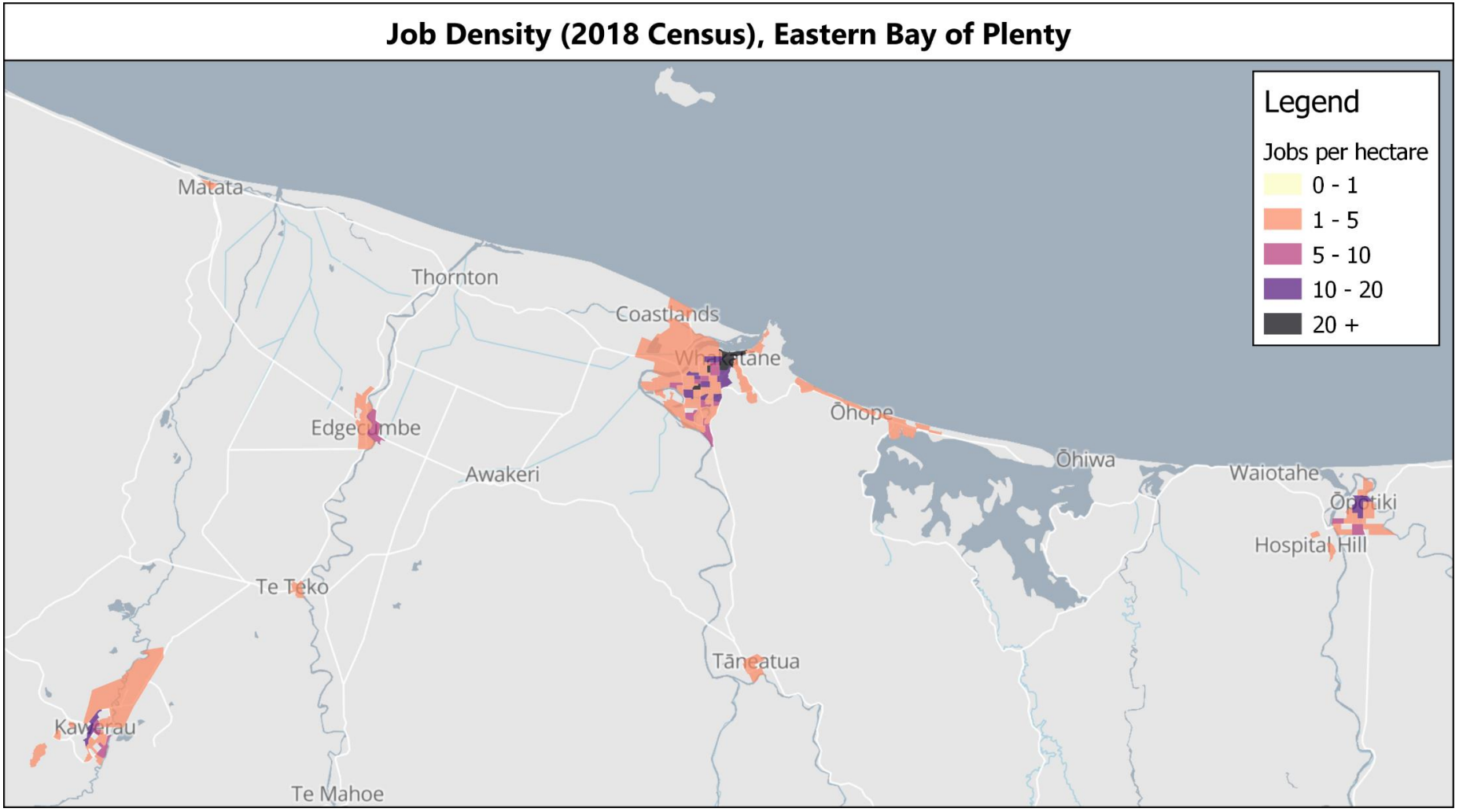


Figure 27 Job density across the Eastern BoP, 2018

6.5 Meeting the needs of the Māori population

As discussed in Section 3.3, the population of the Eastern BoP has a significantly higher proportion of people who identify as Māori than most of the rest of the country. In WDC, the share is over 40% and in ŌDC and KDC, the share is over 50%. For context, nationally, the share is approximately 15%.

According to the Eastern BoP Spatial Plan Foundation Paper[21] on People and Communities, there are over 80 hapū and 69 marae affiliated to the seven iwi (Ngāti Awa, Ngāi Tūhoe, Ngāti Rangitihi, Ngāti Tūwharetoa ki Kawerau, Ngāti Manawa, Ngāti Whare, Ngāti Mākino) in the Whakatāne and Kawerau Districts.

Research[22] prepared for WDC reported that Māori are less than half as likely to own their own home as Non-Māori in the Eastern BoP and that Māori live in more crowded houses with 4.7 people per dwelling (versus 2.7 for Non-Māori). This is a reason why the household incomes by ethnicity discussed in Section 3.4 could seem to be contrary to other data on the topic.

The rental stock in New Zealand is known to be significantly lower quality than the owner-occupied housing stock with BRANZ reporting[23] that rentals are three times more likely to be damp, twice as likely to smell musty, and twice as likely to be poorly maintained. Consequently, it is likely that the Māori of the Eastern BoP tend to live in lower-quality homes than the Non-Māori population.

One of the goals of the NPS-UD is to ensure that councils consider the needs of the Māori population when formulating their FDS and spatial plans. This would seem to be especially important in the Eastern BoP where roughly half the population identified as Māori at the last Census.

In terms of a regional spatial plan, it is important that it allow for the housing aspirations of different segments of the population. This includes being innovative with papakāinga and, as pointed out by the Foundation Paper, encouraging development like the village of 15 houses built in Tāneatua by Te Uru Taumatua.

It also means, more generally, ensuring that district planning regulations aren't unduly restrictive on the types of development allowed and do not artificially and unnecessarily increase the price of housing. It is important to keep in mind, given the makeup of the Eastern BoP, that what is beneficial to the Māori population is likely to benefit the region.

6.6 Key challenges and opportunities for the Eastern BoP

The Eastern BoP is a growing region, but it hasn't always been that way. Figure 28 illustrates how the population of Whakatāne had stagnated from 1996-2013, while the populations of Ōpōtiki and Kawerau were in decline over that period. However, there has been a significant and consistent increase in the population of all three districts since 2013 – the source of which is likely positive internal and international migration to Eastern BoP, which had been historically negative[24]. There are several key attractors to this area which may continue to drive growth in the region, including:

- Economic opportunities: growth in agriculture, forestry and tourism may continue to attract people to move to the region.
- Lifestyle and environment: the scenic landscapes, coastal areas, and outdoor activities may attract people to live in these districts for a lifestyle change. This may also be a factor for people looking for where they want to retire.

[21] https://www.whakatane.govt.nz/sites/www.whakatane.govt.nz/files/documents/whakatane_and_kawerau_spatial_plan_-_people_communities_foundation_report_a2380973.pdf

[22] "Homelessness in the Whakatāne District: A Situational Overview"

[23] https://www.branz.co.nz/healthy-homes-research/hcs/reports/

[24] https://rep.infometrics.co.nz/whakatane-district/population/source-of-growth

- Affordable housing: the cost of housing in the Eastern Bay of Plenty is generally more affordable than larger cities in New Zealand.

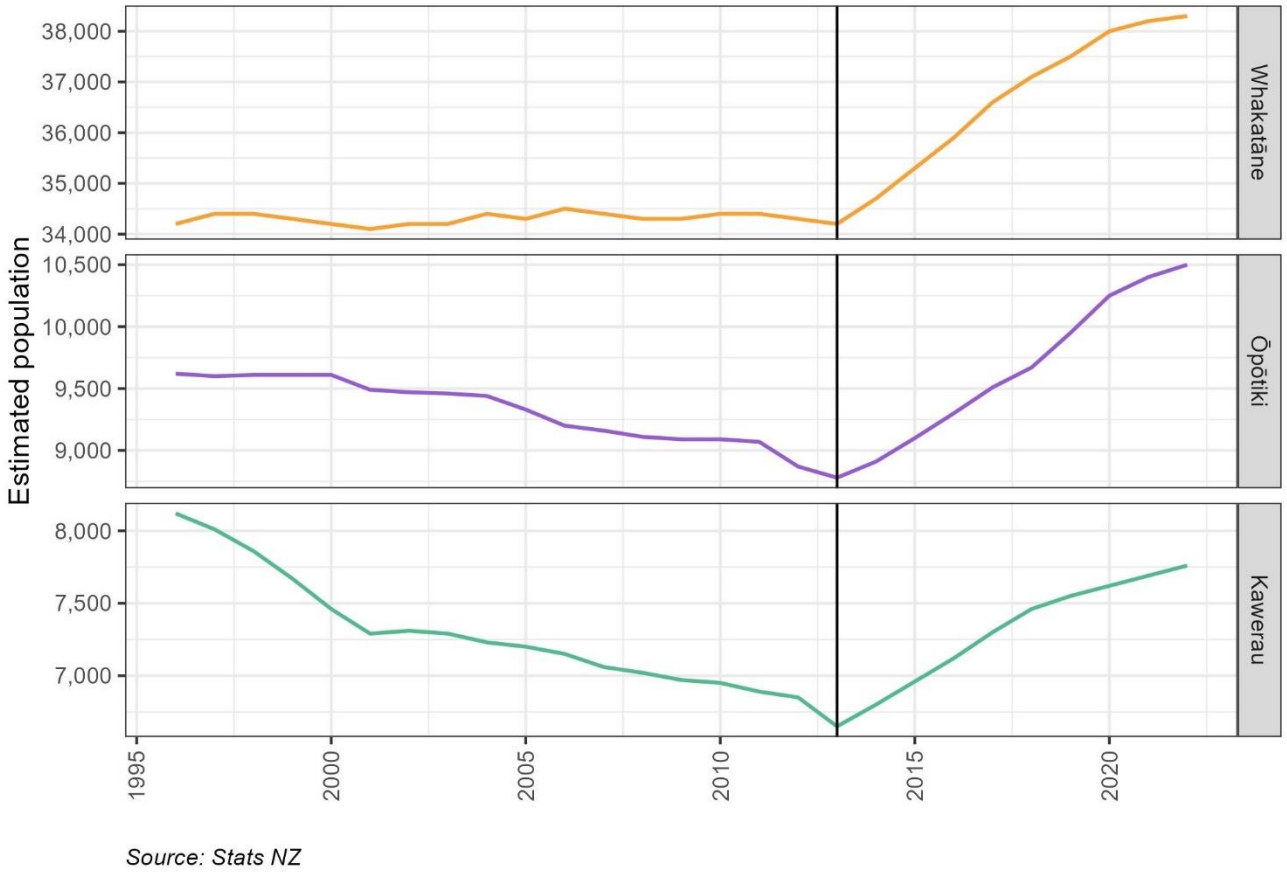


Figure 28 Population estimates for Whakatāne, Ōpōtiki and Kawerau

6.6.1 Opportunities for future growth

The key opportunities for growth in the region probably relate to opportunities from Provincial Growth Fund (PGF) projects. WDC, ŌDC and KDC have collectively received a variety of PGF projects, including:

- Ōpōtiki Harbour: the new harbour and marina at Ōpōtiki is currently under construction, due to be completed in December 2023. This will support the growth and expansion of the offshore aquaculture industry, which will create new jobs both through direct employment opportunities and through supporting industries.
- Ōpōtiki CBD Improvement: growth from the new harbour and marina are expected to generate significant economic activity in the district, contributing to the justification for investing in the CBD.
- Whakatāne Regeneration Programme
  - Te Rāhui Herenga Waka/Whakatāne Commercial Boat Harbour: a new commercial harbour is currently under construction and due to be completed in mid-2024. This harbour will provide commercial operators in Whakatāne with better facilities and the opportunity to grow.
  - Kāinga project/Whakatāne tourism hub: the transformation of the Whakatāne Army Hall into a visitor hub to act as a focal point for the community and visitors alike.
  - Te Ara Hou/Whakatāne Town Centre and Riverfront Revitalisation: this involves revitalising the Whakatāne town centre and riverfront area, which is expected to create social, environmental, cultural and economic benefits for Whakatāne.

Other current opportunities for growth in the Eastern BoP include the opportunity for sustainable industrial growth due to the availability of geothermal power to support high energy industrial activities, and growth in agricultural activities such as orchards.

Growth in the region could be supported by the district councils through infrastructure development to improve transport connectivity to other parts of the country, including through freight networks (both road and rail) and regional public transport options. Strong partnerships between councils and businesses or educational institutions could also create further opportunities for employment opportunities in the Eastern BoP.

6.6.2 Challenges for future growth

The Eastern BoP also has several challenges in terms of achieving continued growth in employment and economic output. Some challenges for growth in this region include:

- Resilience: the Eastern BoP is relatively remote compared to the major urban centres of New Zealand. As a result of this, the area is dependent on a few key transport links, which puts it at risk of being cutoff during major weather events. For example, in early 2023, there were major slips on State Highway 2 at Waiotahi Beach, the Waioeka Gorge was closed, and a rail washout near Te Puke impacted rail to Kawerau. If the export goods from the region are cutoff and can't be transported out, this could create major economic impacts for the region. Significant Government investment is needed to recover from weather events in early 2023 and to build transport resilience for the sub-region to future events.
- Limited diversification of industries: the Eastern BoP is highly reliant on primary industries such as agriculture, aquaculture, and forestry for its employment opportunities. Changes to the market for these industries could therefore have a significant impact on the workforce in this area.
- Workforce retention and attraction: retaining and attracting skilled workers can be challenging and this may have been one of the contributors to the lack of growth in the region from 1996-2013. However, as the region grows, people may become more confident in the stability of their jobs in the region, which could help retain the workforce.
- Climate change and climate adaptation: Much of Whakatāne and Ōpōtiki are low lying areas, putting them at risk of climate change impacts such as sea level rise, more frequent flooding events, and coastal erosion. Climate adaptation to mitigate the impacts of such events may be costly for the councils and the communities and may also decrease the attractiveness of the region as a place to live. As well as this, more frequent drought conditions may impact heavily on the productivity of agriculture businesses, which are a key contributor to economic output in the Eastern BoP.

7 Summary

This report has provided some economic insight and research into likely future population and employment projections for the Eastern BoP, which includes Whakatāne, Ōpōtiki and Kawerau. This work has been completed to help inform spatial planning work which is currently underway.

For this work, we produced new population and employment projections for each district. Growth in each of these districts has been higher than previously projected and the new projections use these recent trends to inform the expected future growth patterns. Three scenarios of population growth were estimated for each district. Table 20 presents a summary of the estimated medium (most likely) population projections for the short, medium and long term.

Table 20 Summary of population projections for each region over time (medium growth scenario)

Area	Current (2022)	Short Term (2026)	Medium Term (2033)	Long Term (2053)
Whakatāne	38,300	40,400	42,400	46,000
Ōpōtiki	10,400	11,200	11,900	13,000
Kawerau	7,800	8,300	8,600	9,000
Total	56,500	59,800	62,900	68,000

Employment projections were also produced for the district. These were based on the population projections, assumptions about the working age population, and future labour force participation rates. A summary of these results is included in Table 21.

Table 21 Summary of employment projections for each region over time (medium growth scenario)

Area	Current (2022)	Short Term (2026)	Medium Term (2033)	Long Term (2053)
Whakatāne	14,300	15,000	15,700	16,300
Ōpōtiki	3,900	4,200	4,600	4,900
Kawerau	2,400	2,800	3,400	3,800
Total	20,600	22,000	23,700	25,000

Both the population and employment projections were converted into estimated future demand for land, which resulted in the following estimates for additional land demand in the long term (by 2053) compared to 2022:

- 316 hectares of residential land
- 59 hectares of industrial land
- 26 hectares of commercial business land

Other key insights about the region from this report include:

- The Eastern BoP has a much higher Māori population than the average across New Zealand (40% in Whakatāne and over 50% in Ōpōtiki and Kawerau, compared to 15% on average in New Zealand).
- After a very long period of flat or declining population growth, Eastern BoP started growing in 2013 and has continued to do so, which has resulted in much higher future population projections.
- Like New Zealand overall, Eastern BoP has experienced a residential building boom – particularly in Whakatāne and Ōpōtiki. The share of townhouses has also been increasing showing a trend towards denser development.
- New Zealand has, on average, seen rental affordability essentially flat over the past ten years. However, in Eastern BoP, rental affordability has declined.
- In the last ten years, house prices in Eastern BoP have increased (percentagewise) much more than the national average. This has led to a marked decline in housing affordability.
- Consumer spending in Eastern BoP increased much more than the New Zealand average between 2019 and 2022.

Appendix A Previous Population Growth Projections for Whakatāne

This appendix shows the previous growth projections which were produced for Whakatāne in the RCG report from March 2020 and compares them to the 2022-base Stats NZ population estimates and projections. The purpose of this section is to show that the 2022-base Stats NZ population projections are much higher than the 2019-base projections. This also reflects the higher than anticipated growth that was outlined in the previous section.

Figure 29 shows the updated Stats NZ population projections for Whakatāne compared to the 2019-base Stats NZ and RCG population projections. Key insights are:

- 2019-base Stats NZ Medium projection is significantly less than all other medium or high projections (RCG report previously noted this was likely conservative)
- The 2022-base Stats NZ Medium projection:
    - is about the same as the previous "RCG High Minus" projection
    - assumes very little change in population, ranging between 38,500-39,520 between 2023-2050
    - projects roughly a similar trend to the previous medium projection (ie almost no growth compared to current estimates), which could be conservative
- The 2022-base Stats NZ High projection is higher than all previous High projections including the 2019-base Stats NZ High and RCG High Plus
- The 2022-base Stats NZ Low projection is similar to the 2019-base Stats NZ Medium projection and is likely very conservative

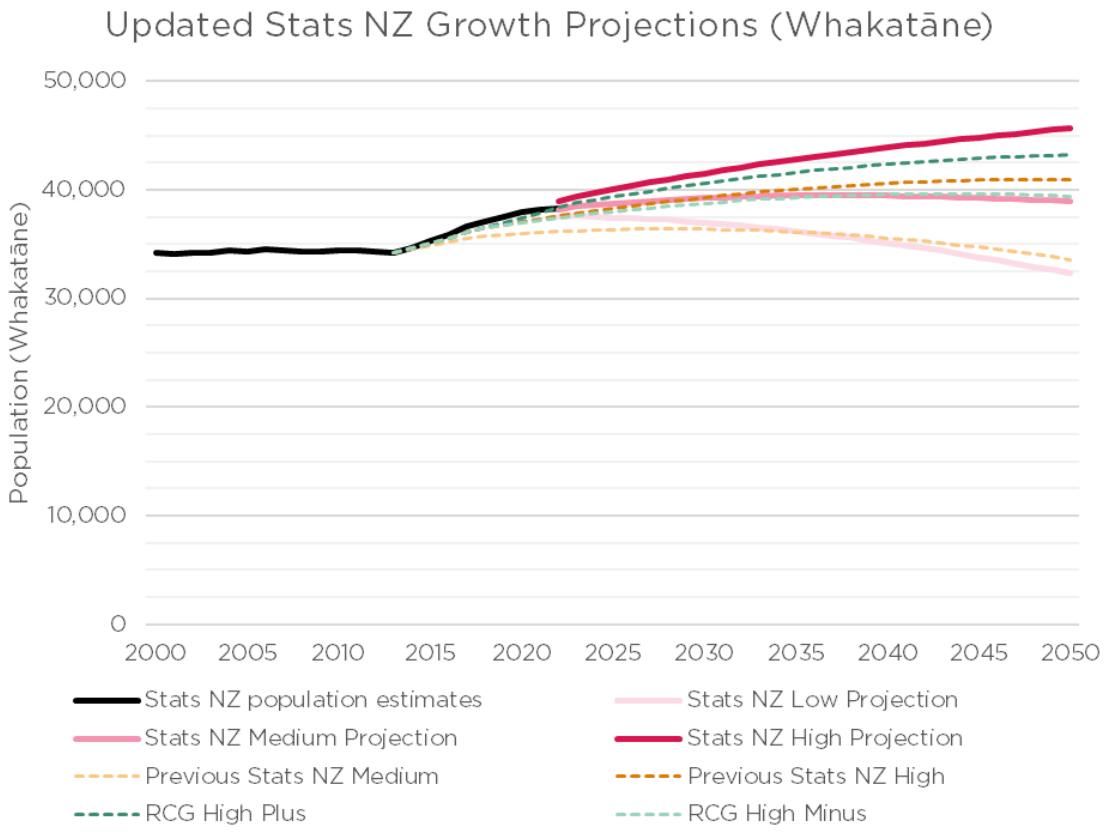


Figure 29 Updated Stats NZ growth projections compared to previous projections

At the time of release in 2022, Stats NZ considers the medium projection suitable for assessing future population changes[25]. The medium series is consistent with the median projection (50th percentile) of the National population projections: 2022(base)–2073 (released July 2022). However, users can judge which projections are most suitable for their purposes. Note that the *subnational* population projections only extend to 2048, while the *national* projections are to 2073.

[25] https://www.stats.govt.nz/information-releases/subnational-population-projections-2018base2048-update/ (Retrieved 4 April 2023)

Appendix B Alternative High Projection for Ōpōtiki

An alternative high growth projection was developed by ŌDC, based on building consent data and trends. This projection has not been included in the main body of this report because it includes all new houses (including for replacement of existing, occupied houses) instead of just net additional housing required. These projections are therefore not directly comparable to the projections in this report, for net additional housing required.

The ŌDC high projection is based on:

- ŌDC building consent data for 'new' houses which includes new builds and relocatable dwellings.
- Based on a comparison between ŌDC and Stats NZ consents data, Stats NZ building consent data for new dwellings *does not* appear to include newly constructed relocatable dwellings.
- Regardless, the estimated number of 'new' dwellings from ŌDC data is much higher than the Stats NZ reported building consent data for new builds (ranging from 10% more to 140% more per year and averaging 80% more over the last 11 years). Annual building consents, reported by ŌDC, for new and relocatable homes in recent years has been:
    - Average of 37 new dwellings per year from 2012-2022
    - Average of 49 new dwellings per year from 2017-2022
    - Very high increase in dwellings per year from 2020-2022:
        - 45 dwellings in 2020
        - 64 dwellings in 2021
        - 83 dwellings in 2022
- Expected growth of 60-85 new homes per year for the next five years, across:
    - Dunes subdivision (next to the Drifts) of 116 lots is being sold
    - Iwi are anticipating building 150-200 homes over the next five years
    - Kāinga Ora are planning to provide 85 new homes over the next three to four years

The ŌDC high growth projection assumes an average increase of 76 new dwellings per year for the next 30 years, equivalent to 2280 new dwellings. This is higher than the annual building consents for every year other than 2022 so represents a significant and sustained increase in dwelling construction in Ōpōtiki.

The ŌDC high projection for new dwellings of 2280 over 30 years is much higher than our high growth scenario, which estimates 1580 new dwellings. We believe that the reason for the much higher upper estimate from ŌDC is because it includes all new houses, not just the net increase in households from population growth. In other words, the ŌDC projections estimate the total number of new houses required, including for replacement of existing houses that might be vulnerable to climate change or other natural disasters, are ageing, or are demolished for other reasons. Our projections are for the total number of additional houses that are required to house the increasing population, above and beyond the current housing stock.

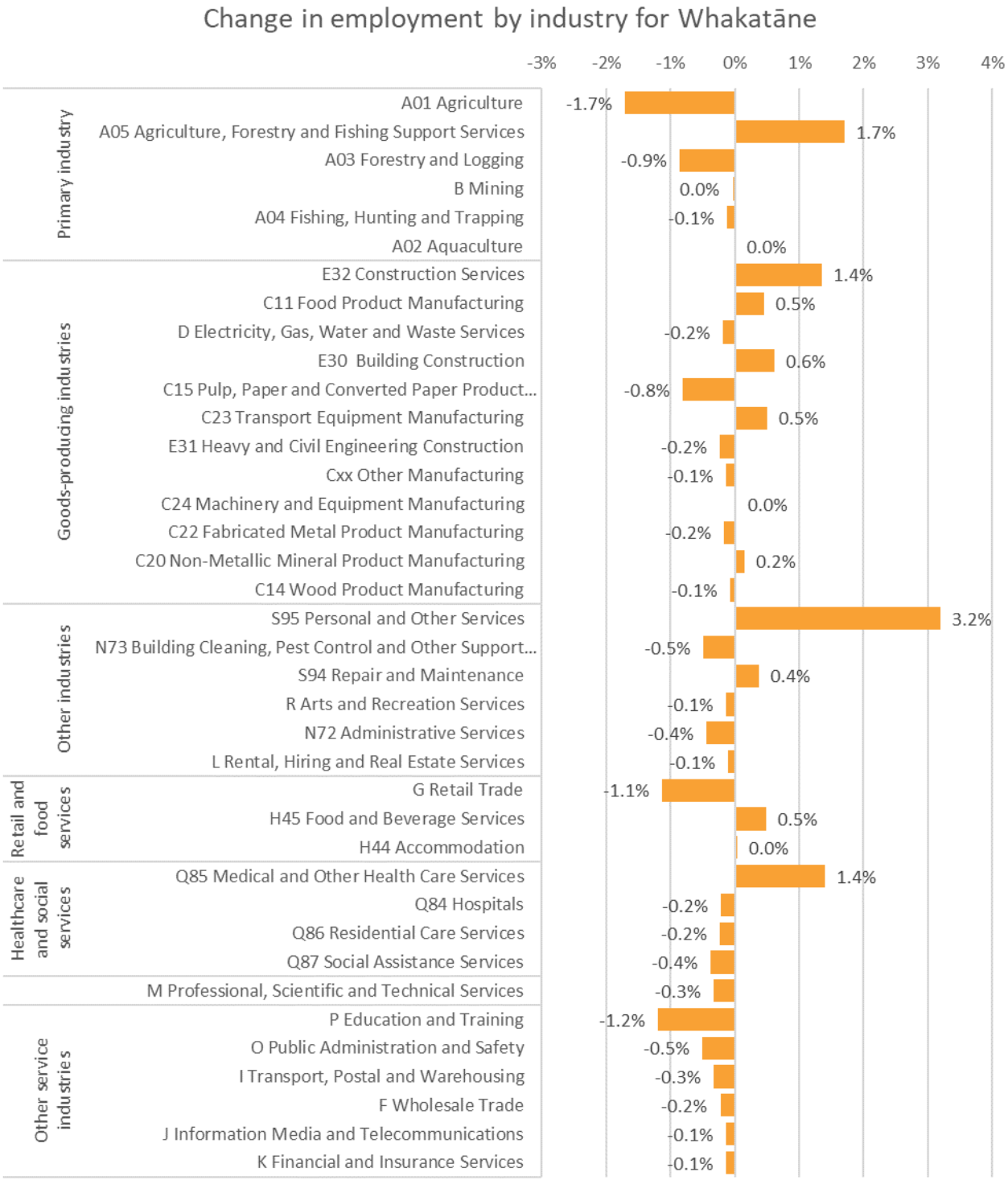
Appendix C Marketview spending categories

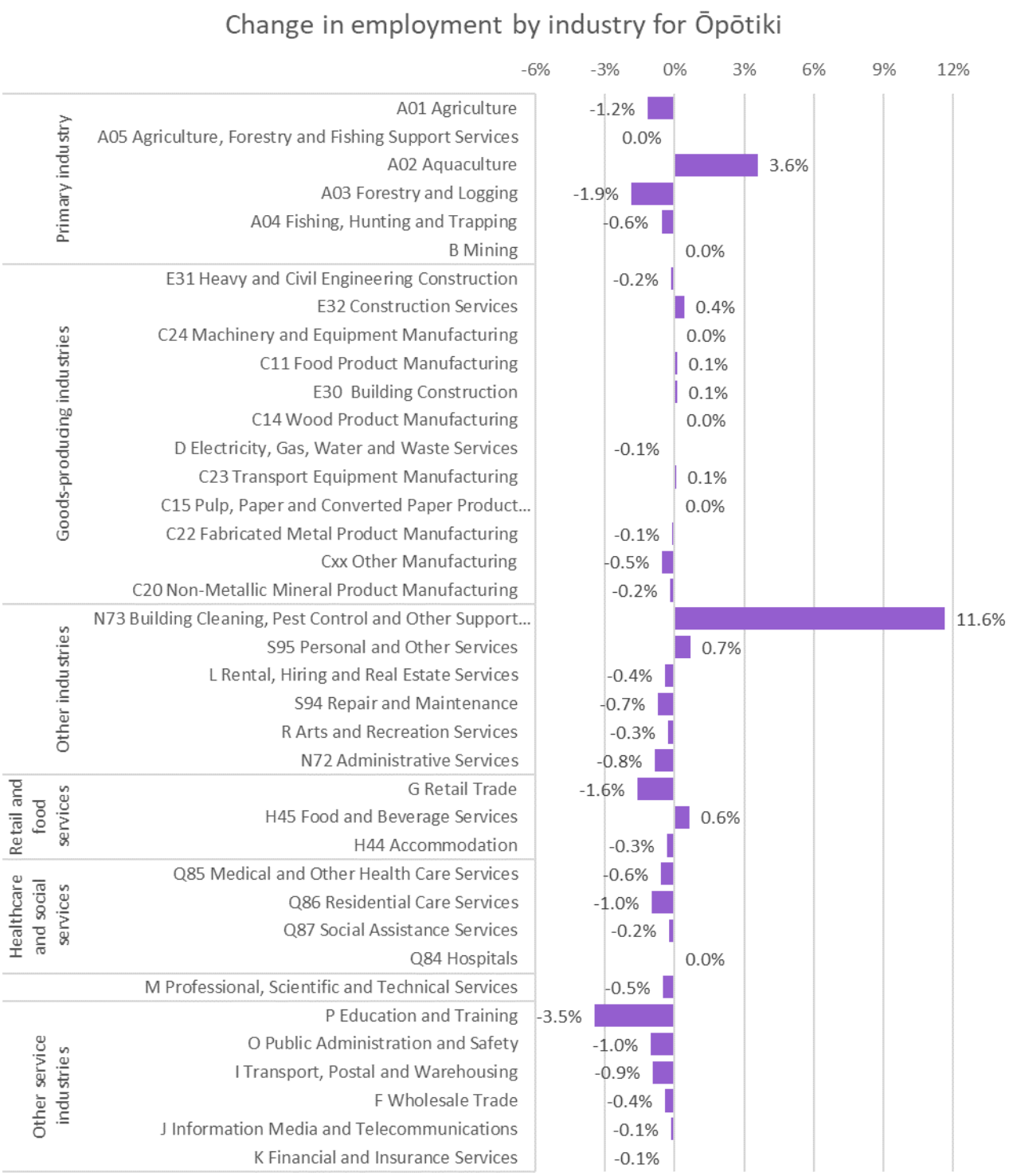
Storetypes	ANZSIC	Description
Accommodation	4400	Accommodation
Cafes, Restaurants, Bars & Takeaways	4511	Cafes and Restaurants
	4512	Takeaway Food Services
	4513	Catering Services
	4520	Pubs, Taverns and Bars
	4530	Clubs (Hospitality)
Retail Trade	4251	Clothing Retailing
	4252	Footwear Retailing
	4253	Watch and Jewellery Retailing
	4259	Other Personal Accessory Retailing
	9511	Hairdressing and Beauty Services
	4241	Sport and Camping Equipment Retailing
	4242	Entertainment Media Retailing
	4243	Toy and Game Retailing
	4244	Newspaper and Book Retailing
	4245	Marine Equipment Retailing
	4260	Department stores
	4271	Pharmaceutical, Cosmetic and Toiletry Goods Retailing
	4272	Stationery Goods Retailing
	4273	Antique and Used Goods Retailing
	4274	Flower Retailing
	4279	Other Store-Based Retailing n.e.c.
	3921	Motor Vehicle Parts Retailing
	3922	Tyre Retailing
	4000	Fuel Retailing

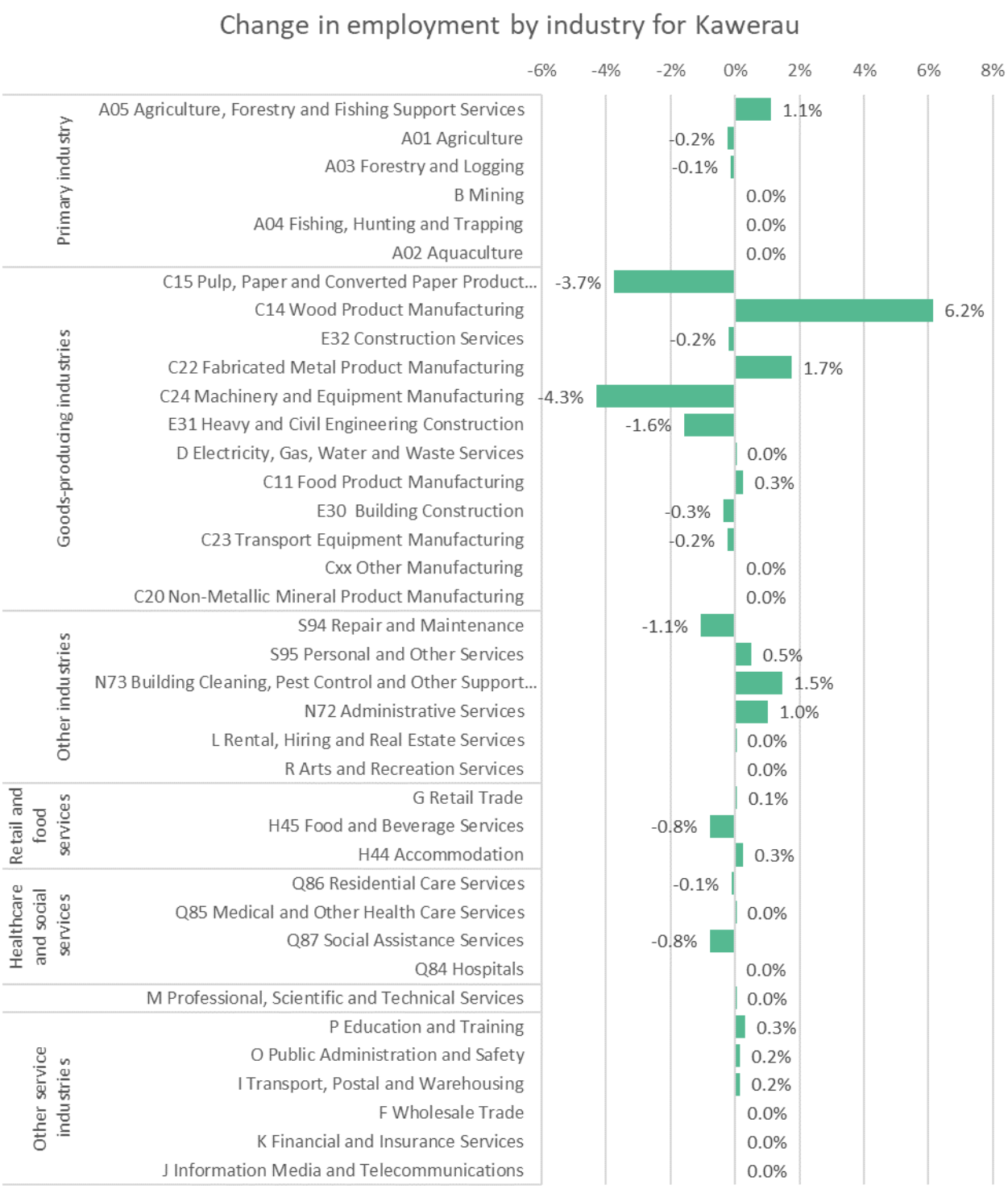
Storetypes	ANZSIC	Description
	9419	Other Automotive Repair and Maintenance
	4110	Supermarket and Grocery Stores
	4121	Fresh Meat, Fish and Poultry Retailing
	4122	Fruit and Vegetable Retailing
	4123	Liquor Retailing
	4129	Other Specialised Food Retailing
	4211	Furniture Retailing
	4212	Floor Coverings Retailing
	4213	Houseware Retailing
	4214	Manchester and Other Textile Goods Retailing
	4221	Electrical, Electronic and Gas Appliance Retailing
	4222	Computer and Computer Peripheral Retailing
	4229	Other Electrical and Electronic Goods Retailing
	4231	Hardware and Building Supplies Retailing
	4232	Garden Supplies Retailing
Rest of Consumer Spending	3911	Car Retailing
	3912	Motor Cycle Retailing
	3913	Trailer and Other Motor Vehicle Retailing
	4320	Retail Commission Based Buying and Selling
	4621	Interurban and Rural Bus Transport
	4622	Urban Bus Transport (Including Tramway)
	4623	Taxi and Other Road Transport
	4720	Rail Passenger Transport
	4820	Water Passenger Transport
	4900	Air and Space Transport
	5010	Scenic and Sightseeing Transport

Storetypes	ANZSIC	Description
	6611	Passenger Car Rental and Hiring
	6619	Other Motor Vehicle and Transport Equipment Rental and Hiring
	7220	Travel Agency and Tour Arrangement Services
	8910	Museum Operation
	8921	Zoological and Botanical Gardens Operation
	8922	Nature Reserves and Conservation Parks Operation
	9001	Performing Arts Operation
	9002	Creative Artists, Musicians, Writers and Performers
	9003	Performing Arts Venue Operation
	9111	Health and Fitness Centres and Gymnasia Operation
	9112	Sport and Physical Recreation Clubs and Sports Professionals
	9113	Sports and Physical Recreation Venues, Grounds and Facilities Operations
	9114	Sport and Physical Recreation Administration and Track Operation
	9121	Horse and Dog Racing Administration and Track Operation
	9129	Other Horse and Dog Racing Activities
	9131	Amusement Parks and Centres Operation
	9139	Amusement and Other Recreation Activities n.e.c
	9201	Casino Operation
	9202	Lottery Operation
	9209	Other Gambling Activities

Appendix D Percentage point change in industry employment (2013 to 2022)




Change in employment by industry for Ōpōtiki
-6%
-3%
0%
3%
6%
9%
12%
Primary industry
A01 Agriculture
-1.2%
A05 Agriculture, Forestry and Fishing Support Services
0.0%
A02 Aquaculture
3.6%
A03 Forestry and Logging
-1.9%
A04 Fishing, Hunting and Trapping
-0.6%
B Mining
0.0%
Goods-producing industries
E31 Heavy and Civil Engineering Construction
-0.2%
E32 Construction Services
0.4%
C24 Machinery and Equipment Manufacturing
0.0%
C11 Food Product Manufacturing
0.1%
E30 Building Construction
0.1%
C14 Wood Product Manufacturing
0.0%
D Electricity, Gas, Water and Waste Services
-0.1%
C23 Transport Equipment Manufacturing
0.1%
C15 Pulp, Paper and Converted Paper Product...
0.0%
C22 Fabricated Metal Product Manufacturing
-0.1%
Cxx Other Manufacturing
-0.5%
C20 Non-Metallic Mineral Product Manufacturing
-0.2%
Other industries
N73 Building Cleaning, Pest Control and Other Support...
11.6%
S95 Personal and Other Services
0.7%
L Rental, Hiring and Real Estate Services
-0.4%
S94 Repair and Maintenance
-0.7%
R Arts and Recreation Services
-0.3%
N72 Administrative Services
-0.8%
Retail and food services
G Retail Trade
-1.6%
H45 Food and Beverage Services
0.6%
H44 Accommodation
-0.3%
Healthcare and social services
Q85 Medical and Other Health Care Services
-0.6%
Q86 Residential Care Services
-1.0%
Q87 Social Assistance Services
-0.2%
Q84 Hospitals
0.0%
M Professional, Scientific and Technical Services
-0.5%
Other service industries
P Education and Training
-3.5%
O Public Administration and Safety
-1.0%
I Transport, Postal and Warehousing
-0.9%
F Wholesale Trade
-0.4%
J Information Media and Telecommunications
-0.1%
K Financial and Insurance Services
-0.1%


Change in employment by industry for Kawerau
-6%
-4%
-2%
0%
2%
4%
6%
8%
Primary industry
A05 Agriculture, Forestry and Fishing Support Services 1.1%
A01 Agriculture -0.2%
A03 Forestry and Logging -0.1%
B Mining 0.0%
A04 Fishing, Hunting and Trapping 0.0%
A02 Aquaculture 0.0%
Goods-producing industries
C15 Pulp, Paper and Converted Paper Product... -3.7%
C14 Wood Product Manufacturing 6.2%
E32 Construction Services -0.2%
C22 Fabricated Metal Product Manufacturing 1.7%
C24 Machinery and Equipment Manufacturing -4.3%
E31 Heavy and Civil Engineering Construction -1.6%
D Electricity, Gas, Water and Waste Services 0.0%
C11 Food Product Manufacturing 0.3%
E30 Building Construction -0.3%
C23 Transport Equipment Manufacturing -0.2%
Cxx Other Manufacturing 0.0%
C20 Non-Metallic Mineral Product Manufacturing 0.0%
Other industries
S94 Repair and Maintenance -1.1%
S95 Personal and Other Services 0.5%
N73 Building Cleaning, Pest Control and Other Support... 1.5%
N72 Administrative Services 1.0%
L Rental, Hiring and Real Estate Services 0.0%
R Arts and Recreation Services 0.0%
Retail and food services
G Retail Trade 0.1%
H45 Food and Beverage Services -0.8%
H44 Accommodation 0.3%
Healthcare and social services
Q86 Residential Care Services -0.1%
Q85 Medical and Other Health Care Services 0.0%
Q87 Social Assistance Services -0.8%
Q84 Hospitals 0.0%
M Professional, Scientific and Technical Services 0.0%
Other service industries
P Education and Training 0.3%
O Public Administration and Safety 0.2%
I Transport, Postal and Warehousing 0.2%
F Wholesale Trade 0.0%
K Financial and Insurance Services 0.0%
J Information Media and Telecommunications 0.0%

Appendix 2

Three Waters Infrastructure – Eastern Bay Spatial Plan Stage 2 report, CKL (2025)

CKL

Planning | Surveying | Engineering | Environmental

3 Waters Infrastructure
EBoP Spatial Plan
Stage 2

Whakatane District Council

Document Information

Client	**Whakatane District Council**
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Author	Bronwyn Rhynd & John Sternberg		
Signed		**Date**	14/04/2025

Reviewed & Authorised By	Bronwyn Rhynd		
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0	DRAFT -for comment	14 August 24	JS, BR	JS, BR	BR
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3	Issue - Final draft – comments WG and Veros	19th May 2025	JS, BR	JS, BR	BR
4	Issue Final	3rd July 2025	JS, BR	JS, BR	BR

Contents

Figures

Tables

Appendices:

Terminology:

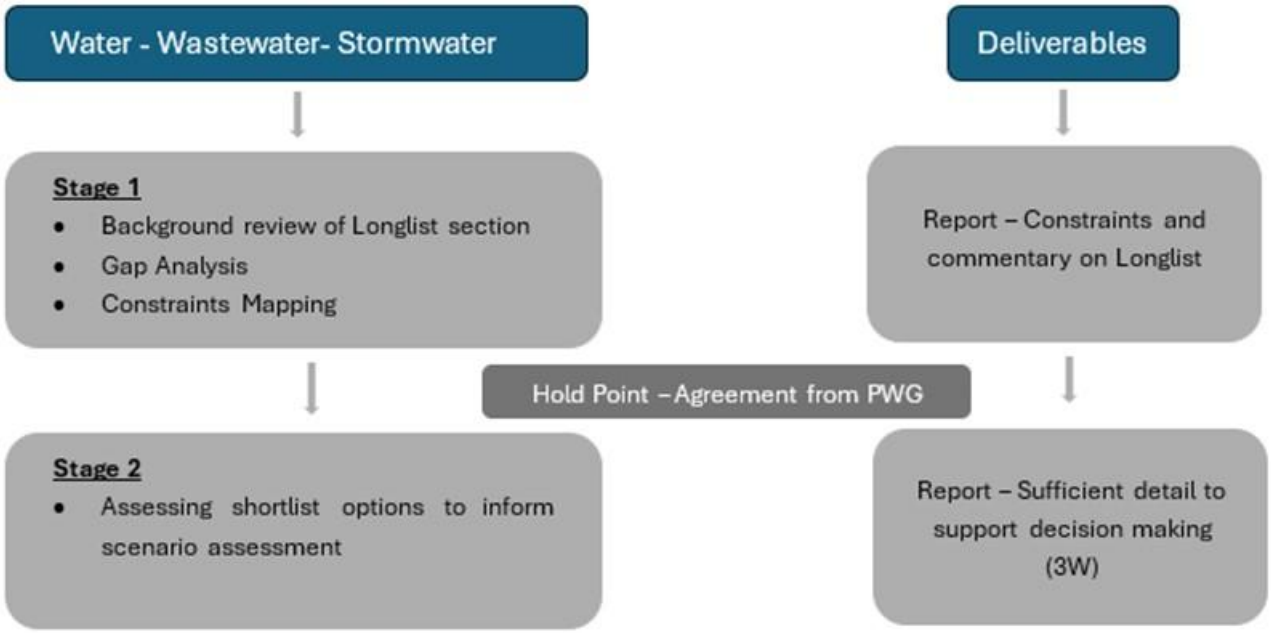
Please note that the following acronyms have been used throughout the document;

- AC – asbestos cement
- BK – Boundary kit (for low pressure WW pumping system)
- BoPRC – Bay of Plenty Regional Council
- CMP -Catchment Management Plan
- DN – nominal diameter
- DP – District Plan
- EBoP- Eastern Bay of Plenty
- I/I - Inflow and infiltration
- KDC – Kawerau District Council
- LOS – level of service
- LPS – Low Pressure System (generally STEP or grinder pumps and small bore pressure pipes)
- LT – long term
- LTP – Long term plan
- MT – medium term
- NPV – net present value
- ODC – Ōpōtiki District Council
- PRV – Pressure reducing valve
- PS (or Pst) – Pump station
- PV – Present Value
- SBR – Sequential batch reactor
- SMP – Stormwater Management Plan
- STEP – Septic tank and effluent pump
- ST – short term
- SW – Stormwater
- TBC – To be confirmed
- W – Water
- WW - Wastewater
- WDC – Whakatāne District Council
- WTP - Water treatment plant
- WWTP - Wastewater treatment plant

1 Executive Summary

The Eastern Bay of Plenty (EBoP) region which includes the Whakatāne, Kawerau and Ōpōtiki Districts and Iwi within these areas, is preparing a spatial plan. The spatial plan addresses a need to plan for around 5,500 new households and business land by 2050 alongside economic development, environmental, and other wellbeing outcomes.

To inform the process with respect to the 3 Waters considerations, CKL prepared a constraints mapping report (Stage 1 in the figure below) for the working group (comprising members from Whakatāne District Council (WDC), Ōpōtiki District Council (ODC), Kawerau District Council (KDC) and Bay of Plenty Regional Council (BOPRC).



The purpose of this report is to highlight the constraints and opportunities for each development option location with respect to the following 3 Waters services:

- Wastewater
- Water supply
- Stormwater

It is acknowledged that there are flood considerations for the development option locations, which may be described as surface water management, however this is outside of the purpose of this report and is highlighted in the Climate and Resilience workstream being undertaken by others in the EBoP Spatial Plan project team.

The working group has since prepared a scenarios and development options draft report for the preferred, short-listed development options - considered by the working group as suitable for further investigation (or already in development), or suitable for further investigation subject to conditions. This report is referred to as the Development Options report (DOR).

Subsequent to this, CKL have prepared this report on 3 Waters infrastructure considerations for the various scenarios – as depicted in Stage 2 of the above diagram.

There are two main parts to this report.

1. Information about different development options locations
2. High level infrastructure requirements, cost, and timelines about the short-listed development options

The following is a summary of key findings in the Stage 2 report, as well as suggested further investigations relating to options and/or comparison of options, relating to servicing of the short-listed development towns.

1.2 Ōpōtiki District

1.2.1 Hukutaia

Water

- Addition of a new river crossing at Stoney Creek and upgrading of the reservoir will improve resilience and level of service in Hukutaia, Ōpōtiki and Waiōtahe.
- Further investigations are recommended once Hukutaia development options and phasing are more refined.

Wastewater

- Plan is to install low pressure sewers and upgrade wastewater infrastructure to ODC WWTP.
- In the short-medium term the intention is to upgrade connectivity (of staged development, infill and some existing houses) and pumping to the existing wastewater treatment plant (WWTP), which will be upgraded, initially (predominantly) to accommodate growth.
- An alternative consideration is to develop a new WWTP west of Hukutaia, but this will require approximately 69ha (+ approximately 50%reserve area = say 105 ha total) for land disposal.
- Recommended further investigations:
    - Undertake economic (PV) assessment of treatment and disposal options for wastewater to compare upgrading existing infrastructure against implementation of a new WWTP and land disposal system, considering land suitability and availability, location, acquisition. requirements (and costs) and longer term added wastewater treatment and disposal resilience.
    - The longer-term impact of industrial growth (mussel farm, other) needs further consideration.

Stormwater

- Development in a staged approach will provide for the growth aspirations for this area.
- Concept design of the stormwater management to support the Hukutaia growth area has been undertaken to provide confidence to deliver a resilient outcome.
- Green infrastructure has been recommended where topography allows.

- Further investigations:
    - Continue to the preliminary design phase to provide certainty of delivering growth .
    - Ensure Hukutaia Growth area assesses and manages effects on downstream drainage systems.

1.2.2 Waiōtahe

Water

- Adequate water supply is available from Ōpōtiki's existing systems for limited expansion, however, proposed upgrades to Ōpōtiki and Hukutaia network (WSP, 2021) will improve this situation.
- Further investigations are recommended for;
    - Optimisation and improvements to Water supply level of service (LOS), considering upgrades in Ōpōtiki, proposed by WSP.
    - Option to provide supplementary water supply to Waiōtahe and Paerata Ridge developments.

Wastewater

- Capacity in the system for pumping of WW to Ōpōtiki WWTP is adequate to accommodate projected, limited growth (116 properties on currently serviced, vacant sections).
- A future river crossing is proposed to transfer wastewater from Hukutaia and Waiōtahe (PS-05) via a new pumpstation and rising main, located near the Marina, directly to the ODC WWTP.
- Recommended further investigations;
    - PV comparison for pumping WW to a potential new WWTP west of Hukutaia vs the current arrangement (pumping to ODC WWTP).
    - Refinement of planned changes e.g. new pumpstation at Marina and a new dedicated rising main across the river for Waiōtahe/ Hukutaia WW, once there is more certainty about the extent and timing of development in Hukutaia.

Stormwater

- The eastern extremity, adjacent to existing development, is highlighted as the area of growth.
- CMP or SMP approach is recommended to provide for urban development, which includes upgrading of existing communal devices.
- Coastal retreat is to be considered however has not been assessed as part of this reporting
- Recommended further investigations:
    - Management of flows through development of a comprehensive CMP and/or SMP.
    - Coastal inundation and retreat requirements from the Climate and Resilience workstream.

1.3 Kawerau District

Water

- Sufficient water supply is available for infill and expansion. However, there is a need for renewal of water take consents and upgrades to infrastructure to ensure compliance with drinking water standards. Consideration needs to be given to additional storage.
- Further investigations are recommended;
    - Assess options and costs for Manganese (Mn) removal from bore water, improvement of spring water, overall supply resilience.
    - Assessment of the feasibility to support growth in Putauaki industrial area.

Wastewater

- There is sufficient capacity at the existing WWTP for planned residential growth – with limitations of taking on more trade waste. The pumice fields can be expanded if/when required. Certain components of the treatment train may require upgrading – an investigation into this is being considered.
- Recommended further investigations;
    - The option to accept WW from TeTeko, consequential plan change requirements, and, pending growth of the TeTeko town, the option to accept additional industrial effluent from Putauaki.
    - Investigate upgrades (and costs) to certain parts of the treatment train to identify and mitigate any constraints and provide additional capacity if required.

Stormwater

- Adequate capacity for increased residential lots within Stoneham Park and the K2 Hardie/Beattie Avenue growth area.
- Groundwater issues have been identified in K2 area, future development is to address this feature.
- Future development is recommended through a comprehensive SMP which includes surface flow management and the influence of groundwater.

1.4 Whakatāne District

1.4.1 Awakeri

Water

- In the short to medium term growth (assumed to be approximately 500 units) can be supported by upgrading storage and also linkage to the Otumahi scheme.
- Future growth here will benefit from linkage to the proposed primary water supply main enroute to Whakatāne (refer Appendix 4 WDC Water Supply Strategy, Concept Working Plan – for conceptual layout/ illustration and clarity).
- Recommended further investigations;
    - Further assess economics of the above, either as a direct on-line offtake or as a dedicated supply i.e. store and boost.
    - Assess interim options (e.g. dedicated pipeline) if the primary main from the Paul Road reservoir is delayed.

Wastewater

- Should significant growth occur here, Awakeri's current septic tank regime should be upgraded to a full water-borne sewage reticulation system. Treatment of WW would be accommodated by either of the following options;
    - An interim modular package plant and STEP/small bore system to accommodate initial/short term growth (say 500 houses). For more substantial growth, this would be followed by extending the package plant (additional modules) or, more likely/economically, by installation of grinder pumps and/or gravity reticulation and a new WW treatment works and land disposal field. The latter has been assumed. Available/suitable land for disposing treated wastewater will need consideration -disposal area is estimated at 69ha (+50% reserve area = total of circa 105ha)
    - An alternative consideration would be to reticulate (grinders and small-bore reticulation) and pump all (or only future growth stages) wastewater to Whakatāne for treatment and

discharge to ocean – in which case upgrading of the WDC WWTP cost could be apportioned on a pro rata basis to accommodate this.
    - Another alternative could be a combination of these options.
- Recommended further investigations;
    - Assess the cost to develop a new WWTP and land disposal as per above options.
    - Undertake a PV comparison of the alternatives (noted above) comparing development of a new WWTP to pumping of Awakeri WW to Whakatāne for treatment and ocean discharge.
    - Implementation of a low-pressure sewer system (STEP and/or grinders) as alternative to conventional gravity wastewater reticulation system. This offers various benefits such as I/I reduction, reduced infrastructure size and potential for sharing infrastructure development costs.

Stormwater

- Catchment wide approach to stormwater management will provide comprehensive guidance to the support of the residential development in the area whilst honouring objectives of Rangitaiki drainage scheme.
- Integration with robust urban design outcomes which includes green infrastructure for resilient outcomes.
- Located within the Rangitaiki Drainage scheme, which needs to ensure continued utilisation to support objectives of this scheme.
- Stormwater management options to include treatment and flow mitigation devices, with respect to quality and quantity, to protect receiving environments.
- Recommended further investigations:
    - Urban design outcomes to integrate SW management.
    - Catchment wide stormwater management plan to guide development to mitigate detrimental effects.

1.4.2 Te Teko

Water

- Growth would require upgrades to the water reticulation. The town is currently linked to Otumahi supply and there is a potential cross-connection to the Plains scheme (normally closed valve).
- Adequate water storage should be available with the proposed, upgraded storage capacity (4Ml) to support growth and/or development of a new town. The elevation of the reservoir would provide suitable pressure head, minimising the need for pressure boosting.

Wastewater

- Significant development (growth) would require a new WWTP together with adequate disposal fields/area or, alternatively, pumping WW to Kawerau for treatment and disposal. Similar to Awakeri, staged development options could be considered.
- Recommended further investigations;
    - Assess feasibility and economics (PV) of treating and disposing wastewater at TeTeko, compared with pumping wastewater to Kawerau, considering need for a Plan Change to the Regional Plan for the Tarawera River Catchment and upgrade requirements/funding for the Kawerau WWTP.
    - Explore staging options, as per Awakeri, should further consideration be given to large scale future development in Te Teko.

Stormwater

This location has similar outcomes to Awakeri, with the added consideration that it lies downstream of the Matahina Dam. While the potential hazard associated with this positioning is acknowledged, its evaluation falls outside the scope of this report.

- Catchment wide approach to stormwater management will provide comprehensive guidance to the support of the residential development in the area whilst honouring objectives of Rangitaiki drainage scheme.
- Integration with robust urban design outcomes which includes green infrastructure for resilient outcomes.
- Located within the Rangitaiki Drainage scheme and needs to ensure that the objectives of the scheme are not compromised for continued utilisation of this scheme.
- Stormwater management options to include treatment and flow mitigation devices, with respect to quality and quantity, to protect receiving environments.
- Recommended further investigations:
    - Urban design outcomes to integrate SW management.
    - Catchment wide stormwater management plan to guide development to mitigate detrimental effects.

1.4.3 Matata

Water

- Water supply from Jennings WTP is adequate to support growth in the short to medium term and a link to Braemar supply would provide supplementary water as/when required to support longer term growth, especially if the development to the east of up to 1500 homes (existing residential zone and future growth area) is realised.
- Recommended further investigations;
    - Assess supplementation (described above) of water supply.
    - Assess additional water storage requirements.

Wastewater

- The growth potential of Matata is largely dependent on the ability to treat and dispose wastewater. Staged development has been considered to accommodate uncertainty in rate of development. This includes implementation of STEP systems, low pressure reticulation and modular package plant treatment to accommodate initial infill and low growth (260 existing + 140 new = 400 units) as well as further infill (500 units) and green fields growth to the east of town. Additional treatment and disposal would be required to accommodate the latter and development to the east of town (600 units).
- Recommended further investigations:
    - Assess availability of land to support the above.
    - An alternative option to consider/investigate could include pumping wastewater (treated, partially treated or raw) from Matata to Whakatāne (via Edgecumbe and potentially including Edgcumbe WW) for further treatment and disposal to ocean. This will have an impact on Whakatāne treatment and disposal capacity and upgrading.
    - Conversely, assess the option to receive pumped, semi treated effluent from other locations (e.g. Edgecumbe) for treatment and disposal at Matata – appropriate agreements and financial contributions would require consideration.
    - The new wastewater standards, once formalised, may potentially impact the above.

Stormwater

- Eastern area is partially within the Rangitaiki drainage scheme and could discharge to the Tarawera River. Stormwater discharge is to be treated and designed with climate change influences, such as increased tailwater conditions.
- Development in the eastern area is to have a catchment wide approach to stormwater management which integrates urban planning.
- Infill within the existing Matata township can occur under current District Plan zoning once wastewater capacity is in place.
- Infill within the existing Matata township may occur under a catchment wide approach to stormwater management and with the co-governance approach with respect to the Te Awa o Te Atua Wildlife Management Reserve, and the Te Awa o Te Atua (Matata Lagoon)
    - Management administered by Tarawera Awa Restoration Strategy group, the Joint Advisory Committee - which includes DOC, Ngāti Tūwharetoa ki Kawerau and Ngāti Awa
    - Protection of the Matata Lagoon is paramount for the longevity of this resource

1.4.4 Whakatāne infill

Water

- Resilience of supply is threatened by having only one bridge crossing into Whakatāne. There is a need for future proofing the supply source and storage and also adding resilience to water supply.
- The option for the primary and secondary mains/links with Braemar and Otumahi lend well to providing the above security and resilience. This could also serve as a supply option for Whenua West of Coastlands (refer below).
- Recommended further investigations;
    - Further manage current demand management initiatives.
    - Maximise use of existing assets e.g. expand current smart metering, water loss management initiatives.

Wastewater

- Whakatāne WWTP has capacity for growth and upgrades are also planned. Opportunity exists to accept WW from various external sources to facilitate growth e.g. Awakeri, Edgecumbe and/or possibly Matata (pending economic comparison of options).
- Benefits of the above include ability to discharge treated WW to the ocean rather than land disposal (availability, cost).
- Recommended further investigations;
    - Assess economics and consent implications of accepting WW from the towns mentioned above.
    - Investigate potential and implications of Papakāinga in the Coastlands area.

Stormwater

- Whakatāne township currently has river protection works underway.
- Current pumpstation upgrades are adding an increased level of service and resilience to the stormwater management system.
- Recommended further investigations:
    - Development to consider the river protection projects currently underway.
    - Consideration of the Whakatāne -Tauranga River catchment responses.

1.4.5 Kopeopeo Infill

Water supply

- Most of the reticulation comprises 100DN PVC and 50DN PVC rider mains. Pending development/ infill/ densification of Kopeopeo, reticulation may require upgrading to cope with additional demand.
- Trunk mains along Domain, King, James and Stewart Streets comprise 200DN AC (asbestos cement) pipes. Pending condition, these AC lines may presumably be nearing end of life. Considering development/infill/densification of Kopeopeo, these mains could be upgraded to larger bore PE or PVC.
- Recommended further investigations;
    - Development projections (new, infill) and associated water demands, implications for the existing network.
    - Identify constraints and any upgrades required.

Wastewater reticulation

- Most of the infrastructure comprises 150DN to 225DN (PVC and AC) reticulation feeding to a pumpstation and 300DN rising main to the treatment ponds.
- At a rough assessment, the rising main should be capable of conveying approximately 200l/s (equivalent of approximately 5000 residential units). Whilst this should be adequate to accommodate further infill growth in Kopeopeo, further assessment is required to confirm available capacity and/or upgrades to accommodate additional flow.
- It is understood that the WWTP has adequate capacity to absorb potential growth in Kopeopeo.
- Recommended further investigations.
    - Development projections (new, infill) and associated water demands, implications for existing network, conveyance to the WWTP and capacity of the latter, given other potential planned upgrades and also considering updated national wastewater treatment/discharge standards, currently (May 2025) out for submissions.
    - Identify constraints and any upgrades required.

Stormwater

- Kopeopeo infill area is at a slightly higher elevation than the Whakatāne CBD area.
- Stormwater piped network level of service is under review at present, and (this network) has a pumped discharge to the Whakatāne River.
- Recommended further investigations:
    - Development to consider the river protection projects currently underway.
    - Consideration of the Whakatāne -Tauranga River catchment responses.

1.4.6 Thornton Dunes

- Due to the nature of development and rural lifestyle in this location it is unlikely to require major infrastructure upgrades.
- However, should significant growth occur in this area this may necessitate upgrading of the water supply (existing 50DN pipe) and storage infrastructure.
- Likewise, wastewater treatment and disposal could be accommodated by additional septic tanks. However, should significant growth occur, a package WWTP and land disposal would need consideration.

- Stormwater management would benefit from catchment wide guidance through a comprehensive stormwater management plan (SMP).
- Development within this area will require landowners to undertake the stormwater management provisions, as guided by the SMP.
- Recommended further investigations;
    - Projected permanent and holiday populations.
    - Explore implications of the above on 3W and potential need for local WW treatment and disposal.

1.4.7 Whenua West of Coastlands

- Whenua West of Coastlands has space for developing approximately 1730 lots (assumed for scaling potential servicing requirements). These would be serviced with bulk water from the existing Whakatāne reticulation in the short term. In the longer term pending the development of the secondary water main from Braemar, this could be an alternative source, free up capacity in the Whakatāne network.
- Wastewater could be reticulated to the existing Whakatāne wastewater treatment plant (ponds) which is believed to have adequate capacity.
- Stormwater management would benefit from developing a comprehensive SMP which integrates with urban planning to ensure there are multiple uses for green spaces.
- Stormwater discharge is to utilise ground infiltration capacity with secondary surface flow to remnant stream bed and onto the Orini Canal.
- Recommended further investigations.
    - Extent of development and future-proof potential connection to the proposed secondary water main from Braemar to Whakatāne.
    - Extent of development and broader impact on wastewater bulk transfer and treatment (WDC WWTP capacity).

1.5 General considerations – moving forward

- Timing of development (ST/MT/LT) – updating of CKL assumptions and funding of developments (split between private and public).
- Impact of Local Water Done Well relating to ownership, operating and maintenance, funding.
- Implications of new wastewater treatment and discharge standard (national norm).
- Catchment wide stormwater management plans to support resilient management of stormwater, mitigation of effects to drainage schemes and integrate outcomes from Climate and Resilience workstream, being undertaken by others in the EBoP Spatial Plan project team.
- Optimised use of existing assets – including initiatives such as water demand management, monitoring and management of water consumption and losses.

2 Introduction

The Eastern Bay of Plenty sub-region (EBoP) spatial plan includes the Whakatāne, Kawerau and Ōpōtiki Districts and Iwi within these areas. The spatial plan addresses a need to plan for around 5,500 new households and business land by 2050 alongside economic development, environmental, and other wellbeing outcomes.

In order to inform the process with 3 Waters considerations, CKL prepared a constraints mapping report (Stage 1 in the figure below) for the working group, comprising members from Whakatāne District Council (WDC), Ōpōtiki District Council (ODC), Kawerau District Council (KDC) and Bay of Plenty Regional Council (BOPRC).

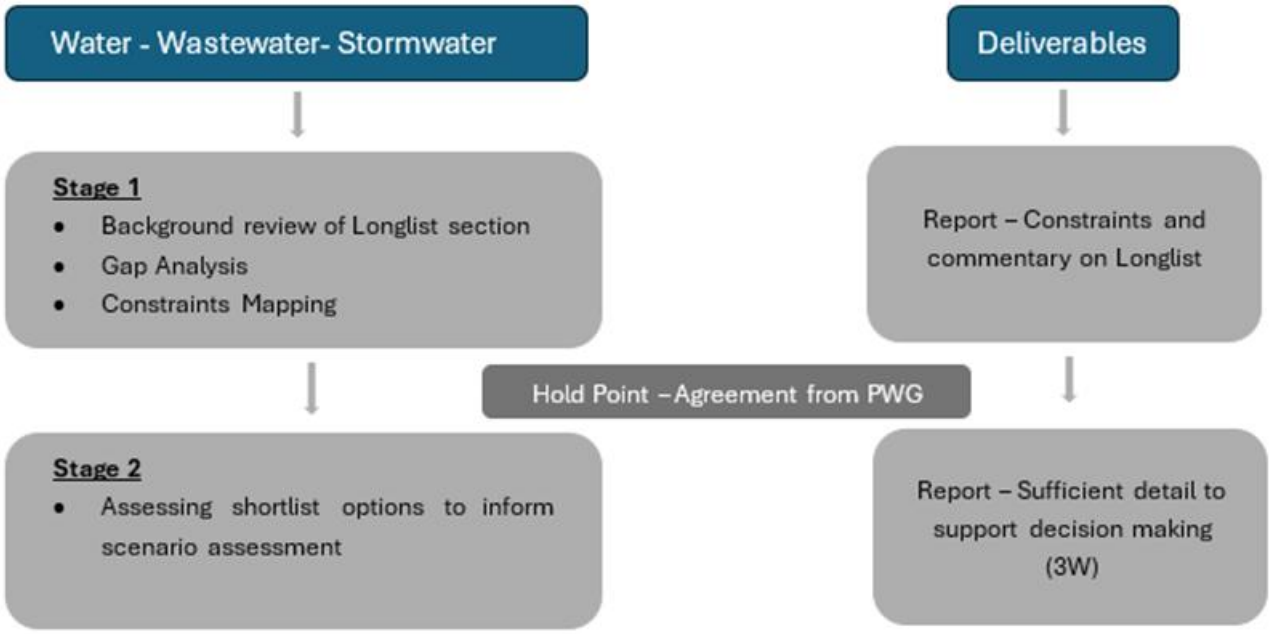


Figure 1 – Staged Approach

The working group (comprising members from WDC, ODC, KDC, BOPRC) has since prepared a scenarios and development options draft report for the preferred, short-listed development options - considered by the working group as suitable for further investigation (or already in development), or suitable for further investigation subject to conditions. This report is referred to as the Development Options report (DOR).

CKL have completed Stage 1, and this report meets the requirements of Stage 2. CKL has been appointed to provide professional advice with respect to the Three Waters (3-Waters) services and infrastructure updates for the Draft report (May 2024), including collating high-level costs for the emerging preferred development options. Further and more detailed work for some of the localised areas may provide additional and improved understanding about infrastructure requirements.

The purpose of this report is to highlight the constraints and opportunities for the development option(s) location(s) with respect to the following 3 Waters services:

- Wastewater
- Water supply
- Stormwater

There are two main parts to this report:

1. Information about different development options locations; and
2. High level infrastructure requirements, cost, and timelines for the short list development options.

2.1 Flood risk acknowledgement.

It is acknowledged that there are flood considerations for the development option locations, which may be described as surface water management, however this is outside of the purpose of this report. Flood risk is considered through the assessment of different development options throughout the course of the Spatial Plan Project. Further integration through and with catchment and stormwater management plans will be required to fully highlight the flood and climate change risk. This will be required early in the process (Plan change and Master Planning) leading to the resilient development of any growth area.

3 Background information

The CKL 3-Waters project team has met with council staff from WDC, ODC, KDC, and BoPRC to receive an update on the evaluation progress of short-listed development options, including timing, associated pros, cons, and costs for various components of the scenarios.

Findings from the meetings have been captured (details can be provided if required) and utilised in the preparation of this report. Information provided by WDC, KDC and ODC to support this report included many technical documents that can be supplied upon request; however, a list of key documents are as follows.

No.	Report reference	Council referenced
	Our Places Development Options Report (Draft v.1.3, May 2024)-Referenced as DOR	ODC, WDC, KDC
	Water Supply Strategy Direction – Concept Working Plan, 2022	WDC
	Water Supply Strategy – Concept Costing. Warren McKenzie,2022	WDC
	Whakatāne water growth assessment, One Water, 2024	WDC
	Concept costing *Matata* PDP, (Ver 5_350 houses), 2022 –	WDC
	Concept costing *Matata,* Summary (version 6, Tahi-Jennings-Pokerekere Options), 2023	WDC
	Ōpōtiki Hukutaia Stormwater Concept Design, PDP, August 2022	ODC
	Ōpōtiki Hukutaia Wastewater Concept Design, PDP, 2022 and 2023	ODC
	Ōpōtiki Water Model Updates - Growth Modelling Assessment, WSP, 2021	ODC
	Ōpōtiki Water Supply Model Build and Calibration	ODC
	Update following the Climate Resilience and Flooding workshop on 31 October 2024, Dec 2024, technical Working Group	WDC, ODC, KDC
	Whakatāne water growth assessment – Final, June 2024 (One Water Modelling)	Whakatāne DC
	Whakatāne Plains Water Supply -Investment Decision Framework, 2022	WDC
	Concept costing (2022, 2023) Matata (PDP)	WDC
	WDC Water Supply Asset Management Plan, 2021	WDC
	WDC, ODC, KDC consents list and renewals (various)	WDC, KDC, ODC

With respect to the cost assessment of options, this has been kept at a high level and has excluded any present value (PV) assessments. Cost estimates have been gleaned from reports made available from WDC and the EBoP project team as well as the CKL database.

3.1 Assumptions

Various assumptions have been made within this report.

3.1.1 General Assumptions

- House occupancy:
  - House occupancy varies between reports for various areas. Since the numbers and associated costs in this report are high level estimates, a figure of 2.6 people per house has been adopted as an average of the MR Cagney figures (2.5-2.7).
  - However, for Ōpōtiki and Hukutaia, figures from the PDP reports (2022, 2023) have been adopted to align with other assumptions in those reports, for consistency, namely 2.95 people per house.
- Water consumption:
  - Water consumptions have been assumed as 220l/p/d.
- Wastewater yield:
  - Wastewater yield has been assumed as 200l/p/d.
- Costs:
  - Cost estimates are based on a number of sources of information and CKL rates as summarised in Appendix 1. Rates therefore vary from yr. 2021 to yr. 2024 but have been escalated where required at 3% p.a.
  - For Water and Wastewater a 30% markup on costs has been allowed to cover peripheral costs such as;
    - Contingencies and establishment costs
    - Investigation and reporting
    - Planning and consenting
    - Design.
  - Stormwater have not allowed for additional costs as outlined above.
- Flood hazards:
  - For clarity the flood hazard review is not included as a separate consideration to the stormwater servicing for each option, as this is included in the Climate and Resilience workstream assessment reported by others.
- The timing of development and infrastructure requirements is summarised in Table 1 below.
  - This information has been gleaned from various sources, including:
    - Reports by PDP (2022, 2023) relating to Hukutaia and Matata
    - Our Places: Future Development Options (2024), and
    - Discussions with participating council staff and consultants (PDP, McKenzie, Intosea).

- Program timing assumptions;
  - ST – short term: 2023 – 2026
  - MT – medium term: 2027 – 2033
  - LT – long term 2034 – 2053.

3.1.2 Scale of developments and numbers of units

The scale of development and number of units utilised in this report is summarised in Table 1 below. This information includes the timing as well as split between new and infill housing.

Table 1 – Assumed scale and staging of key proposed developments

Development location/description	No. new houses	Infill housing	Est. Timing	Reference/comment
Ōpōtiki - Hukutaia				
Stage 1	446	294	ST/MT	PDP report 2023
Stage 1A	741		MT	
Stage 2	1592		LT	PDP report 2023
Waiōtahe		116	MT	Currently consented
Whakatāne		TBC	ST	"Our Places"
Kopeopoeo Infill		TBC	ST/MT	Further assessment required
Thornton dunes		TBC	MT	Further assessment required
Whenua West of Coastlands	1730	TBC	MT	Estimated, still under discussion
Awakeri	3,300			Working group "Our Places"
Awakeri – stage 1 – assume	500		ST/MT	Discussion WDC
Awakeri - future	2800		MT/LT	Discussion WDC
Te Teko	3300	TBC	MT/LT	Working group "Our Places" – assume similar staging/ split to Awakeri
Matata	1,500	TBC		Working group "Our Places"
Stage 1	400	TBC	ST/MT	260 existing + 140 new
Stage 2	500	TBC	MT	Additional infill – WDC discussion
Stage 3	600		LT	Remaining residential and future growth area east of town (WW dependant) - Additional infill – WDC discussion
Kawerau		TBC	T	"Our Places"

3.1.3 Stormwater management plans to support growth

Stormwater management plans are developed to support growth areas and typically undertaken to inform re-zoning under the Plan Change stage and master planning to support a resilient urban outcome.

Several of the EBoP Spatial Plan identified growth areas are located within a flood and drainage schemes. The Bay of Plenty Infrastructure Strategy identifies residual risk, climate change and affordability as significant issues for the flood schemes in the Bay of Plenty Region.

The requirements of these schemes are to provide resilience to the drainage of the surrounding/supported catchment to enable the land use (of the area) with success of delivering positive outcomes without changing to overall objectives of the scheme. As such any of the identified areas will need to be cognisant of the requirements of the (particular) drainage scheme that is relevant to them.

Many of the existing settlements are located adjacent to large river systems and the flood hazards are varied within the EBoP Spatial Plan area. This report does not address flood risk specifically, although it is acknowledged that the Eastern Bay sub-region features a number of river systems and is susceptible to a number of natural hazards Notwithstanding this the flood hazards are interlinked with surface flow management which has been identified but is not within the scope of this report.

The objectives and benefits of catchment management planning and stormwater management plans is to incorporate the identified flood hazards and risks as well as other drainage systems and schemes, that will be part of the overall surface water management of the catchment/growth area. This will ensure the importance of these are not overlooked when future development areas are considered. This includes the delivery of resilient stormwater management through the various design processes that subsequently occur for the delivery of the growth area.

The catchment wide stormwater management plan (SMP) will provide the strategy that demonstrates the overarching principles of how the catchments stormwater is to be managed. Stormwater management of a catchment, or individual site within the catchment, should have the objective of minimising or mitigating any detrimental effects of urban (including residential commercial and industrial) and rural activities on the sensitive receiving environments or the levels of service of the flood scheme.

Elements of the stormwater strategy will include, but not limited to, the following:

- ✓ Water quality
- ✓ Hydrological mitigation
- ✓ Flood attenuation
- ✓ Conveyance and discharge regimes

This strategy will also reflect the region and district wide sustainably projects that are current at the time of writing the SMP, including any that are in progress. Examples of this the region wide River Scheme Sustainability Project, BOPRC Stormwater Management Guidelines, Asset Management Plans.

SMP development ensures that the effects of urban development as well as objectives of the flood scheme are managed in an integrated manner. An example is the increase in surface flow volume and peak flow which is reflective of the change from rural to urban landform. This change impacts on the receiving environment which requires a comprehensive management response that is cognisant of other dynamic elements within the catchment, such as the agreed levels of service of the existing flood scheme.

A comprehensive SMP that includes a catchment wide stormwater management strategy that development can follow will ultimately result in successful management to protect the receiving environment from adverse effects.

A Catchment Management Plan (CMP) delivers a stormwater management plan based on the overarching objectives of the watershed catchment, not just the development area (or area of interest). This report refers to either a catchment wide SMP (CMP) or an SMP for the development area.

In summary, preparation of SMPs will provide an integrated approach to catchment-wide stormwater and flood management. These will be referred to in the development of master planning, which informs structure planning. The strategy within the SMP will address the effects of climate change, whilst guiding the outcomes to agreed levels of service of drainage schemes and downstream risk is managed.

4 Short-Listed Options – 3 Waters Considerations

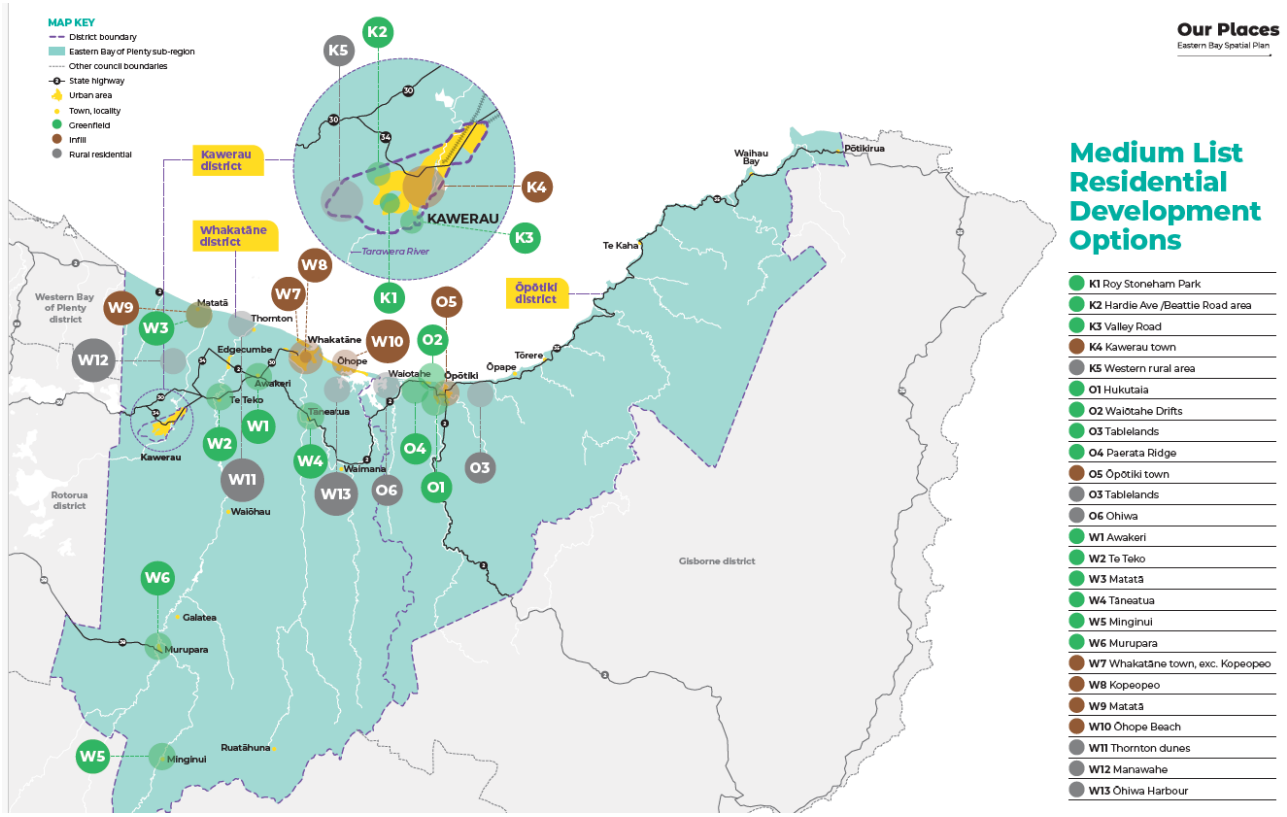


Figure 2 – Short-listed options

This section is a further assessment of the short-listed options and considers 3 Waters infrastructure requirements to support growth potential which are rated GREEN OR YELLOW only. For clarity the options are extracted from Section 15 of the DOR.

suitable for further investigation (or already in development)

suitable for further investigation, subject to conditions.

It is noted that, in addition to the above options, in response to submissions, the area west of Coastlands which is referred to as Whenua West of Coastlands has been added to this assessment.

Included in this section are high level cost estimates, implications and assumed timing. It should be noted that;

- Cost estimates are based on a number of sources of information and CKL rates. Rates therefore vary from yr. 2021 to yr. 2024 but have been escalated where required at 3% p.a. These are high level cost estimates for assessment of implications and feasibility only.
- Councils have reviewed cost estimates. However, costs should not be used for budgeting before review.
- Where available, funding source (development vs. council) is noted. However, councils will have a clearer understanding of these and can be updated as/if required.

4.1 Ōpōtiki District

4.1.1 Hukutaia

4.1.1.1 Water Supply

For consistency, development staging has been aligned with PDP assessments for wastewater infrastructure development:

- Stage 1 – an additional 446 new houses are proposed, with approximately 294 infill houses.
- Future stage(s) – an additional 1592 houses are proposed.
- Water supply resilience options in the form of additional storage and an additional water pipe-crossing at Stoney Creek Rd to Hukutaia and added water boosting/storage in Hukutaia are being considered by ODC (Ref. WSP, 2021).
- Refer to Figure 3 below for indicative location of pipe crossing

It is also noted (WSP, 2021) that the upgrades for Hukutaia could also improve the level of service at Waiōtahe regarding potable and firewater pressures.

Figure 3 – Hukutaia Water Booster and River Crossing Location – Stoney Creek Rd

High level cost estimates are presented in the following table.

Table 2 – Water options assessment and cost estimate - Hukutaia

Development description	No.	Unit	Cost bulk infrastructure (x1000)	Cost reticulation (x1000)	Timing	LTP Funded?
Water resilience – Reservoir/Booster and river crossing at Stoney Creek	1	Sum	$2,580		ST/MT	Y - partially[1]
Additional houses – short term	446			$2,295	ST/MT	N
Additional houses – longer term	1592			$8,278	MT/LT	N
Hukutaia rising main (renewals	1	Sum	$1,530		ST/MT	Y

Note:

1. 50% funded LTP, 50% development contributions.

4.1.1.2 Wastewater

General Development;

Development staging is assumed as per PDP (2022/3) reports. The figures relating to number of houses per stage differ marginally from above but are included for consistency with PDP cost estimates.

- Stage 1 - It is assumed that in the short term that some (refer below) of the existing 466 houses as well as an additional 294 (infill) and 446 new houses, i.e. total of 1187 houses will be converted to pressure sewer.
- Stage 1A - assumed an additional 741 (1187-446) houses connected to low pressure system. This stage includes decommissioning of existing septic tanks.
- Future – an estimated 1592 houses will be connected to the low-pressure scheme, including decommissioning of those septic tanks) and additional WW treatment capacity will be required at the ODC WWTP.

As part of the WW strategy ODC will reserve WW capacity upgrades in Stage 1 for new developments or for existing homes that need to retire their existing septic tanks. If a property has a suitably functioning septic tank ODC prefer them to continue to use it as long as they can to reduce pressure on the reticulation and WWTP for as long as possible or until such time that ODC are confident they have suitable capacity to accommodate existing homes.

A low-pressure sewer system and bulk transfer line is to link with existing infrastructure to convey wastewater to the existing WWTP via existing pumpstations and rising mains (which will need upgrading), plus an additional pumpstation near the Marina, and river crossing to link directly to WWTP. This upgrade will cater for the future development and future tie-in to the WWTP upgrades (and/or to an alternative, new WWTP west of Hukutaia– see below).

Low pressure grinder pumps and small-bore reticulation (referred to as a “low-pressure system” is a versatile means of servicing growth and has a number of advantages (reduced I/I, staging etc.) as well as funding opportunities to split costs (pumps, reticulation, boundary kits) between the developer and council.

Two options are being considered for Hukutaia WW reticulation, treatment and disposal;

Option 1 –The network would need to be linked to the rising main to the ODC WWTP or, in future, a new river crossing installed (in future, possibly picking up Waiōtahe wastewater as well). Pumpstations (1, 4) and ODC WWTP will need upgrading to accommodate additional flow (PDP, 2022). In future pumpstations 4 and 1 will be bypassed and Hukutaia and Waiōtahe wastewater will be pumped directly to the WWTP via a Waioeka River crossing and pumpstation at the Marina location.

Option 2 – Similar to option 1, a low-pressure reticulation system would also be considered. However, a new WWTP is being considered (Discussion ODC, PDP, 2024) W of the Waioeka River to cater for WW from Hukutaia and Waiōtahe – adding resilience by freeing up capacity of the existing WWTP and providing an alternative site if the existing works is compromised (i.e. from a natural hazard). This will however only be considered in the longer (10 – 20 yrs) term subject to further investigation, assessment of risks, costs and availability of suitable land. An assessment of land disposal (of treated wastewater) requirements was undertaken by Ormiston's Consulting (refer to Appendix 3) – a conservative disposal rate (3.5mm/d) was assumed for the estimates below.

Funding Considerations

Early upgrades (in the LTP) include extending WW into Hukutaia but bringing all the flow across the Waioeka River to WWPS01 before pumping back across the Otara to the WWTP. ODC have budgeted $3.5M (stage 1) for this in the LTP, including new pipes into Hukutaia, WWPS 04 Rising Main Separation / WWPS05 upgrade. An assumption has been made in the LTP that 75% of the cost is associated with development contributions, the balance to be funded by ODC.

ODC have allowed $16.3M in LTP over next 10 years to upgrade the WWTP. Not all of this is to accommodate Hukutaia however an assumption has been made in the LTP that 30% of the cost is associated with development contributions, the balance to be funded by ODC.

A further $1.7M for upgrade of WWPS01 (which wouldn't all be as a result of Hukutaia Growth) and $2.7M is allowed for a duplicate rising main crossing the Otara River to compliment the WWPS01 upgrade. An assumption has been made in the LTP that 30% of the cost is associated with development.

ODC plan to follow this work with the installation of a WWPS at the Marina development and having the western side WW (Hukutaia and Waiōtahe Drifts/Dunes) pumped directly to the WWTP without needing to come into Opotiki township, although this may not be required if the WWPS01 upgrade is sufficiently sized which is still being worked through.

Table 3 – Wastewater options assessment and cost estimate – Hukutaia

Development description	No.	Unit	Cost bulk infrastructure (x1000)	Cost reticulation (x1000)[6]	Timing	LTP Funded?
Option 1 – Hukutaia WW to existing ODC WWTP						
Developer portion – total development – grinders, boundary kits				$65,084 – split into 3 stages as below, pro-rata no. units – adjust for ST decom* and retic*.	ST/MT/ LT	Developer
Stage 1 – Council portion only – 446 new	446	Units	$3,500 Council downstream infrastructure	$10,445 (on-lot only – grinder, BK, no ST decom)	ST/MT	Y partially [1]
Stage 1A (1187-446) – Council portion only – portion of existing + infill	741		$5,093 (Retic only)	$17,354 (on lot only – grinder, BK, decom ST's)	MT	N
Stage 2 – long term	1592	houses	$8,200 (of which $4m allowed in Infrastructure strategy (not LTP) at 100% DC's	$37,284	LT	N[4]
Stage 1 ODC WWTP Upgrade (DC – 30% of $16.3m, ODC balance – 70%)			$16,300 [2]		MT	Y partially [2]
WWPS01 upgrade + Duplicate rising main [7]			$1.7M + $2.7M = $4.4m		MT	Y partially[3]
Stage 2 Long term - additional infrastructure/ pumpstation[8]	1592	houses	$8,200		LT	N[4]

*decom =decommission, retic = reticulation

Option 2 – develop a new WWTP at Hukutaia (Stages 1, 1A, 2 costs and split same as above)						
New WWTP for Hukutaia + Waiōtahe [6]	2779+300	houses	$25,613		LT	N
Land disposal [5]	62	ha	$6,851		LT	N
Rising main and other bulk infrastructure			$1,500		LT	N

Notes:

1. In LTP - 25% funded by council, 75% by development

2. In LTP funding (refer ODC discussion) - 30% of this is attributed to development contributions, 70% ODC

3. In LTP - 30% funder by development contributions/other, 70% by council

4. In infrastructure long term (30yr) strategy however not in the 10yr LTP

5. Land disposal costs only – estimated land disposal area for total development – see note 6. Cost estimate excludes land acquisition costs. Add 50% reserve area for total land area required.

6. Estimated for total development at Hukutaia (current plus future) as well as estimated total units from Waiōtahe

7. Costs for WS01 and duplicate rising main allowed – refer discussion with ODC

8. Refer PDP (2022, Option 2 - LPS) Incl. pump station upgrades, river crossing.

The following figure provides the location of Hukutaia in relation to the possible future new WWTP and disposal area west of the Waioeka River, however the potential position/location is yet to be determined.

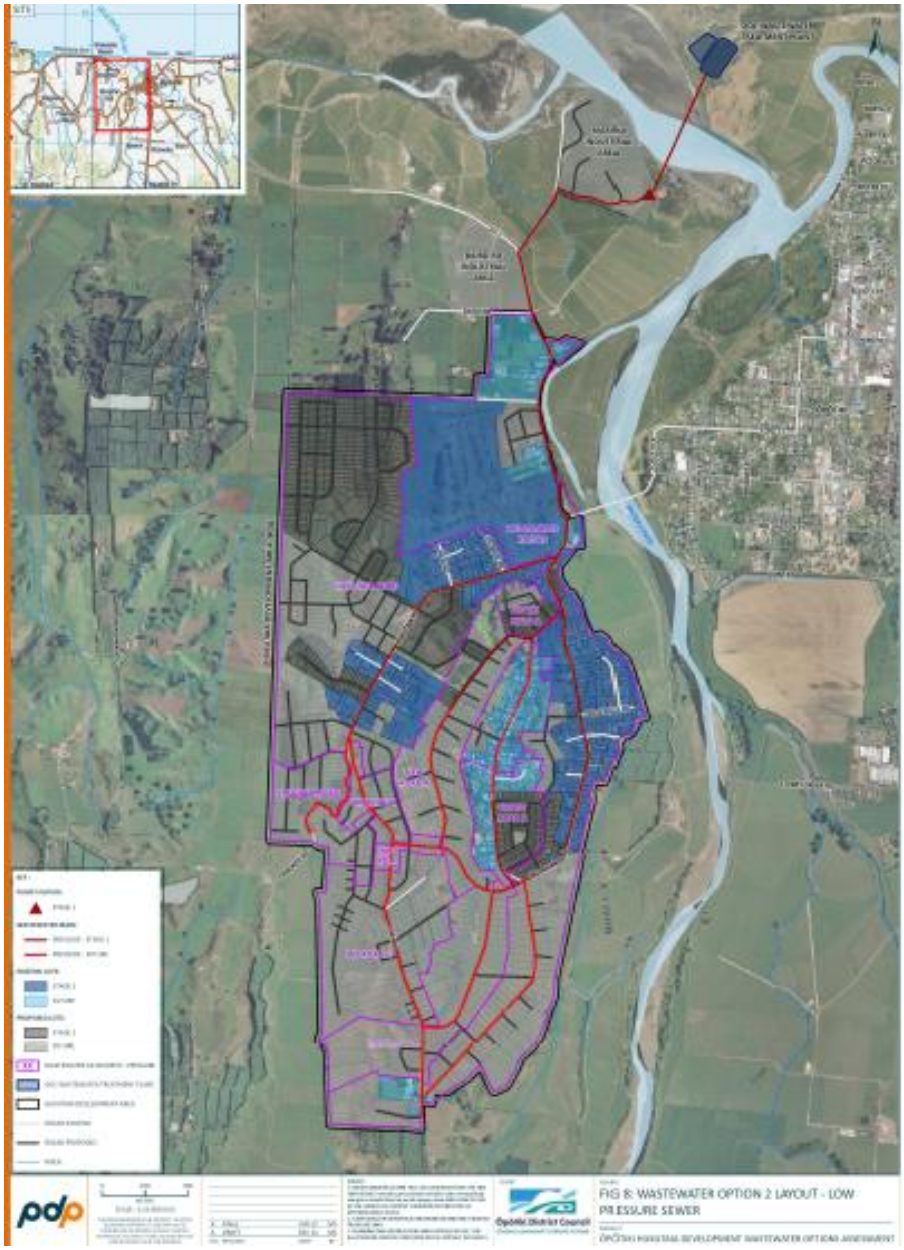


Figure 4 – Hukutaia – possible future new WWTP and disposal area west of the river

It is to be noted that the extent of the flood plain with respect to the development option for Hukutaia is undertaken in the Hazards assessment, which is outside of the scope of this report. Notwithstanding, any development including WWTP is to be located outside of any flood plain.

4.1.1.3 Stormwater

The stormwater management needs have been established through the PDP (2022) stormwater options report which outlines the requirements, in a staged approach, as well as the costing. A summary of the stormwater management best practicable option is presented in the Figure 1 - Hukutaia Concept stormwater servicing overview, presented below.

For this report the following aspects are acknowledged to be included in the stormwater options assessment to support growth in Hukutaia:

- Updated river modelling, currently being prepared by BOPRC.

- Objectives of the flood scheme and the River Scheme Sustainability project.
- Downstream drainage systems are included in the overall stormwater management approach.

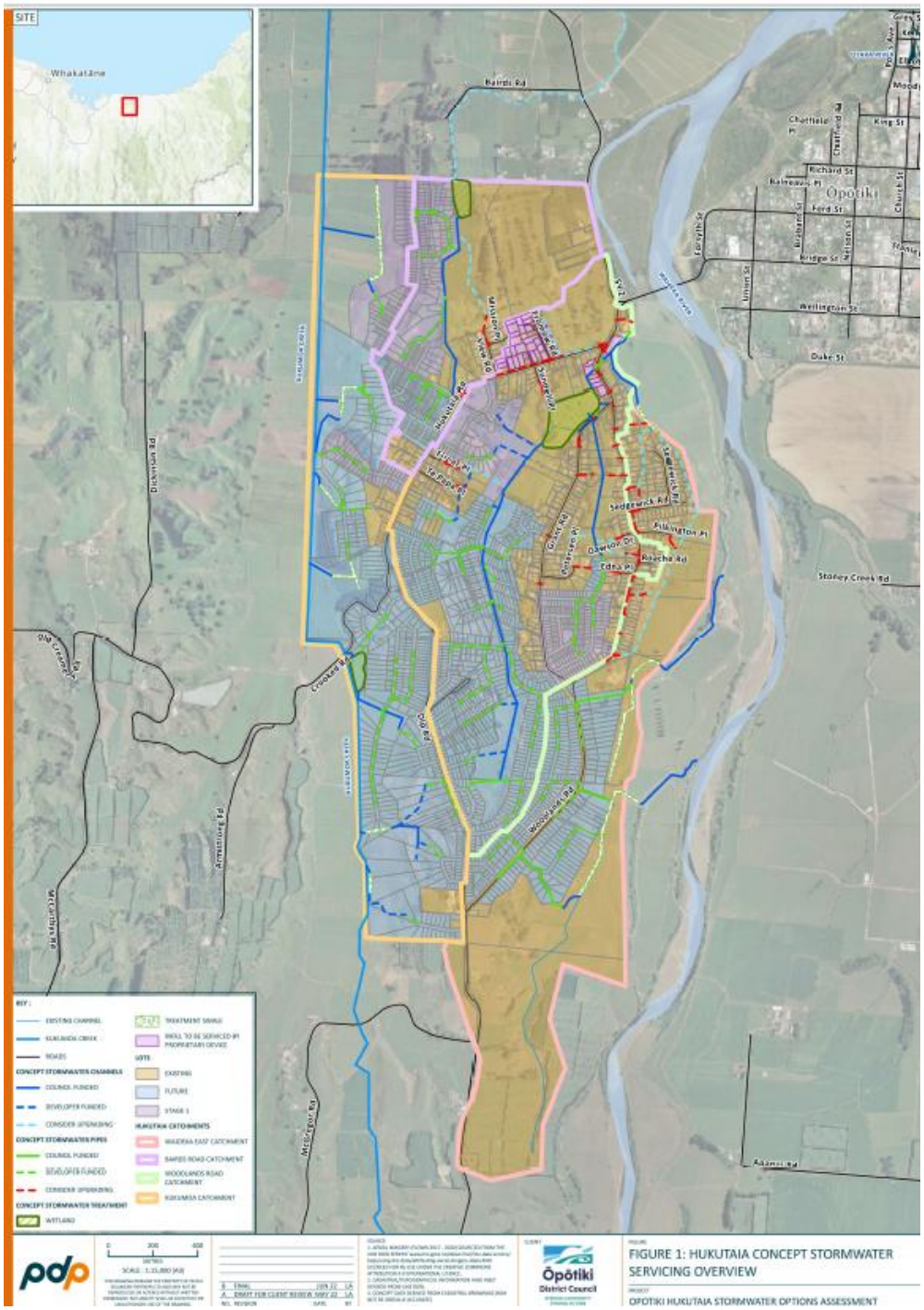


Figure 5 Hukutaia SW management [1]

The lots provided for within the Hukutaia project is 2198[2] with the breakdown as follows:

[1] Ref Figure 1 - PDP 2022

[2] Ref PDP report August 2022, Sections 3 to 6 inclusive.

Table 4 - Hukutaia Lot projection - PDP 2022

Catchment	Lots			Proposed New		
	Infill	Existing	Total	Stage 1	Future	Total
Woodland	222	79	301	215	568	783
Waioeka East	16	92	108	0	281	281
Bairds Rd	8	34	42	131	141	272
Kukumoa	5	7	12	102	297	399
Sub- Total	251	212	463	448	1287	1735
Catchment wide total						2198

The costs for the proposed development have been included in the PDP report and presented in the following table:

Table 5 - Summary of stormwater management costs[3]

Table 26: Capex Summary

	Stage 1 ($'000)	Future ($'000)	Total ($'000)
Base Estimate	17,546	32,418	49,964
Safety Contingency	5,260	9,720	14,980
Total Capex	22,810	42,120	64,930

Notes:

1. *Upper bound estimate, i.e., includes expected contingencies and an additional 30% safety contingency*
2. *Capex includes both ODC and Developer funded assets*

It is to be noted that costs include:

- Both capex costs for developer and ODC for the stormwater management presented in the report
- Includes both the reticulation and communal devices for stormwater management.

For ease of reference the following table provides the Hukutaia requirements for growth expectations of the current Spatial Plan.

[3] Reference: PDP report August 2022, table 26.

Table 6 – Stormwater options assessment and cost estimate - Hukutaia

Development description	No.	Unit	Comments	Cost communal and reticulation (x1000)	Timing	LTP Funded?
As per PDP reporting						
Stage 1 – Council portion only - existing + infill +448 new	911	Lots	Incl. private and public infrastructure	$22,810 ODC & Developer funded $3,130 –ODC have allocated this amount in the LTP	ST/MT	Y partially[1]
Long term	1287	Lots	Incl. private and public infrastructure	12,000	LT	N[2]
Extrapolated to Spatial Plan demands						
Stage 1 –446 new (infill 294 Lots already serviced with respect to stormwater)	446	Lots	Incl. private and public infrastructure	$1,070 communal (wetland) $10,097 (retic)	ST/MT	N
Long term -Stage 2	1592	Lots	Incl. private & public Infrastructure	$3,850 communal (wetland) *$48,252 (retic)*	LT	N

Notes:

1. *Costs of communal is associated with a wetland, public infrastructure is associated with reticulation*
2. *25% council allocation, 75% development allocation within LTP funding*
3. *Included in infrastructure strategy (long term)*

4.1.2 Ōpōtiki Infill

It is to be noted that this development option is not included within the highlighted options that required further consideration, however, the CKL team have included this option for completeness. The following highlights the outcomes of the review.

Water

Water supply and storage is assumed to be adequate for infill options, potentially requiring upgrades which could be catered for in the renewals budget. Installation of the proposed Stoney Creek River crossing will improve network pressures and levels of service.

Wastewater

Upgrades will be required for the ODC WWTP, pumpstations and reticulation to cater for growth in Hukutaia and Waiōtahe, including installation of a new river crossing. Further investigations should be considered regarding the option to establish a new WWTP in Hukutaia and diversion of Hukutaia and

Waiōtahe WW away from the existing WWTP (refer Hukutaia section above) as this will free up capacity (extend life of the existing WWTP assets) for further infill/growth and/or improve resilience.

The longer-term impact of industrial growth (mussel farm, other) needs further consideration.

Stormwater

Key flood resilience projects are underway which include the following:

- Rural-Urban flood protection with southern limit of Duke Street
- Review of the flood resilience options such as the transfer of flood flows from Otara River to Waioeka River flood plain
- Duke street pump station
- Tarawa Creek Pumpstation upgrade

Any development within the Ōpōtiki township is to consider undertaking a comprehensive SMP, which includes flood scheme objectives, to enable development to occur without detrimental effects.

Further investigations:

- BOPRC Rivers model updates to be provided
- Assessment of flood risk for the existing Ōpōtiki township
- Integrated catchment-wide approaches to manage existing and future development

4.1.3 Waiōtahe

4.1.3.1 Water Supply

Waiōtahe currently has water supplied from Ōpōtiki via a 150DN PVC main. Water is supplied to a reservoir for balancing demand/pressure. Waiōtahe currently consumes about 60m^3/d with the supply capacity far in exceedance of this rate. However, it is reported (WSP, 2021) that pressure at the entrance to the reservoir is low, as is residual pressure for fire demands therefore upgrading of the supply will be required. This is covered by the WSP (2021) report that assesses options for network improvement including at Hukutaia e.g. Stoney Creek Road River crossing and booster as well as upgrades to the Hukutaia booster station and reservoir (tank), refer to figure below. The 116 additional units (currently consented) are to be built on existing, serviced lots. Further expansion is assumed limited by flood/coastal inundation risk. No immediate upgrades to the water storage, boosting or reticulation are envisaged.

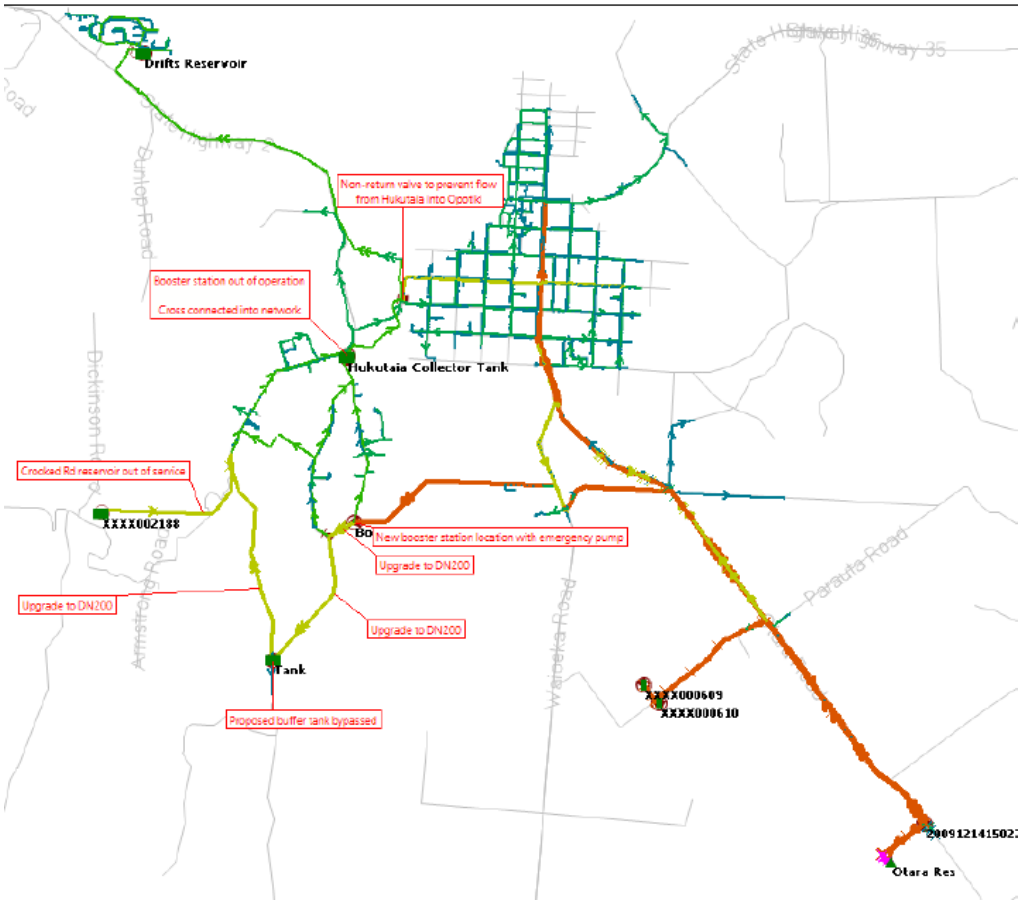


Figure 6 – Waiōtahe water supply improvement (WSP, 2021)

4.1.3.2 Wastewater

The development is reticulated, and wastewater is pumped to Ōpōtiki for treatment through a 150DN rising main. Additional units can be accommodated in the reticulation and the 150DN rising main has capacity, but additional capacity will be required at the ODC WWTP. Pumpstations on route to the Ōpōtiki WWTP will need upgrading (refer Ōpōtiki upgrades described above).

Additional emergency storage may be required at Waiōtahe. In the longer term it is expected that wastewater will be pumped directly (together with Hukutaia wastewater) to the ODC WWTP via a new pumpstation located near the Ōpōtiki marina.

Conversely, if a new WWTP is installed west of Hukutaia, WW can be pumped to that WWTP – which will free up capacity at Ōpōtiki WWTP. However, this option is unlikely to proceed within the next 20 years. To assess land disposal requirements for this option, specialists (Ormiston Consulting) were consulted (refer Appendix 3)

Table 7 – Wastewater options assessment and cost estimate - Waiōtahe

Development description	No.	Unit	Cost bulk infrastructure (x1000)	Cost reticulation (x1000)	Timing	LTP Funded?
Option 1 – pump all WW to ODC WWTP	Current capacity					
Option 2 – pump to new Hukutaia WWTP (long term not within the LTP horizon i.e. approx. 20 yrs) [1]						
New rising main and pumpstation	12	km	$6,490		LT	N[2]

Notes:

1. *Will free up capacity at ODC WWTP*
2. *In long term (30yr) infrastructure strategy, not included in the LTP*

The following figure shows the indicative rising main location west of Hukutaia, to new WWTP.

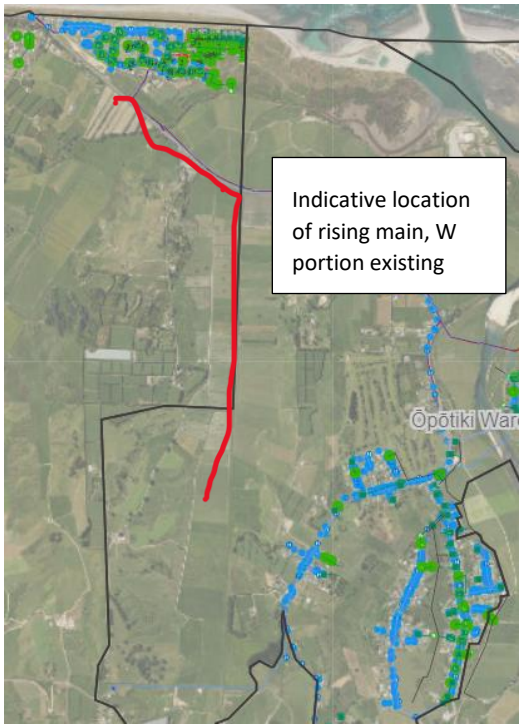


Figure 7 – Waiōtahe additional development – option to pump to new WWTP W of Hukutaia

4.1.3.3 Stormwater

The eastern extremity is the growth location for Waiōtahe. This will consist of the continuation of the existing stormwater management which includes disposal to ground (Soakage) via communal soakage park.

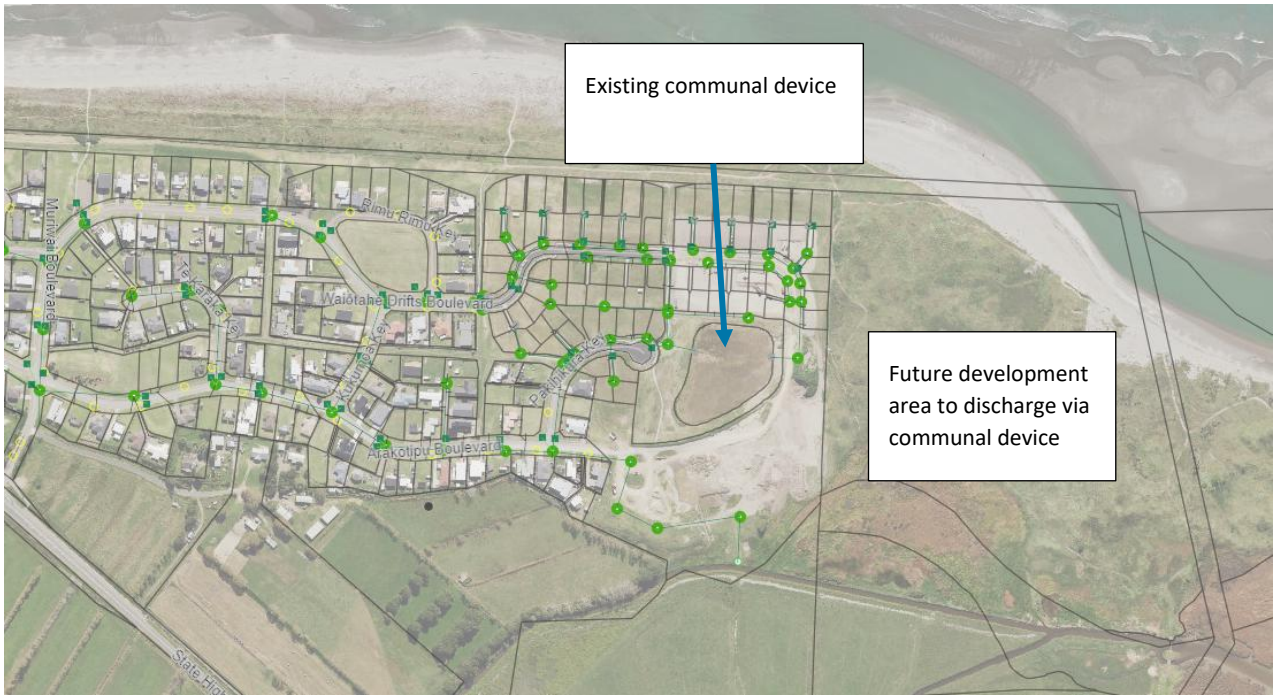


Figure 8 - Waiōtahe -extension of existing SW management[4]

The location of the growth area needs to be cognisant of coastal retreat, however there is an elevation difference, as a coastal buffer, that could be considered within the overall defence of this natural phenomenon. The coastal inundation study has not been reviewed as part of this reporting.

A catchment wide approach to stormwater management through either a catchment management plan (CMP) or Stormwater management plan (SMP), is recommended to ensure that the management of flows to the Te Karaka Stream and the overall drainage system and the adjacent residential area is not compromised as a result of increased development.

For the purposes of costing the communal device will need to be upgraded to include the additional lots proposed in this area.

Table 8 – Stormwater options assessment and cost estimate - Waiōtahe

Development description	No.	Unit	Comments	Cost bulk infrastructure (x1000)	Timing	LTP Funded?
Additional lots within eastern area	116	Lots	Upgrade of communal device only	$278	MT	N

It is to be noted these costs do not include the reticulation requirements of the residential development of the additional 116 Lots as this is assumed to be within the existing reticulation capacity.

[4] Accessed from ODC GIS Maps

4.2 Whakatāne District

4.2.1 Awakeri

4.2.1.1 Water Supply

Development requirements are assumed to comprise of the following (refer Appendix 4 WDC Water Supply Strategy, Concept Working Plan – for conceptual layout/ illustration, for clarity):

- Short term – retain/upgrade storage at Awakeri, connection to Otumahi link, for supplementing current supply to serve an additional 500 houses.
- Longer term - connection to the proposed Otumahi-Whakatāne primary main (fed from the new Otumahi reservoir) is recommended. It is noted that, if this does not occur, or is delayed, a new dedicated main (approximately 8km of 200DN pipeline) linking Otumahi to Awakeri could be proposed. It is noted that in this case 41% (Awakeri/Whakatane 3300/8000 connections) of the estimated $13.1m to upgrade the Otumahi WTP will be apportioned to Awakeri development.
- Installation of pressure reducing valves/controls will be required to manage flow and pressure for each of the bulk water connections (assumed direct on-line to benefit from available pressure).
- Bulk reticulation of water to new development(s) from the Otumahi connection(s).

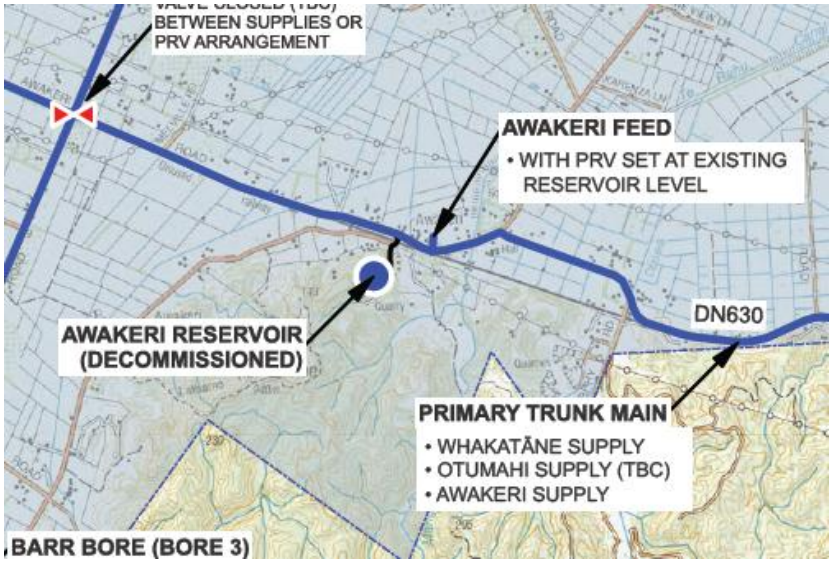


Figure 9 – Awakeri Connections to Proposed Primary Main from Otumahi[5]

High level cost estimates are presented in the following table. Two bulk connections (metered, pressure reduced) to the bulk main from Otumahi have been assumed – one illustrated above and an additional, second connection, as a contingency allowance, to provide for both sides of town. Allowance has been made for bulk water supply line(s) to the development areas (locations not shown - to be confirmed).

[5] Refer McKenzie – Whakatane Concept Working Plan, Appendix 4

Table 9 – Water options assessment and cost estimate - Awakeri

Development description	No.	Unit	Cost bulk infrastructure (x1000)	Cost reticulation (x1000)	Timing	LTP Funded?
Stage 1 – 500 new houses						
Upgrade reservoir and/or linkage to Otumahi scheme, bulk supply from Awakeri reservoir - allow	1	Sum	2,000		ST/MT	N
Reticulation for 500 units				2,600	ST/MT	N
Stage 2 – future development 2800 lots						
Financial contribution to the bulk primary main[1]	1	Sum	$13,063		MT/LT	N
Bulk connections to primary main, for future development area(s) and bulk supply to developments	1	Sum	$1,082		MT/LT	N
Contribution to Otumahi WTP upgrade	1	Sum	$5,412		MT/LT	N
Awakeri reservoir decommissioning[1]	1	Sum	$579		MT/LT	N
Reticulation to new area	2,800	houses		$14,560	MT/LT	N

Notes

1 – Financial contribution equated to estimated cost of an independent 200ID dedicated main

4.2.1.2 Wastewater

Two options have been identified;

1. Stage 1 Short term – 500 units
    - Install STEP, small bore reticulation and a package (Innoflow or similar) treatment plant and land disposal system.
2. Stage 2 (2800 additional units in future)
    a. Option 1 – develop a new WWTP and disposal field at Awakeri;
        i. Grinder pumps on each lot.
        ii. Small bore reticulation to new WWTP.
        iii. Conventional (SBR/other) treatment plant.
        iv. Land disposal.
    b. Option 2 – Pump WW to Whakatane WWTP;
        i. Grinder pumps to each property

ii. Small bore reticulation.
iii. Pump station and rising main to Whakatane WWTP.
iv. Upgrade Whakatane WWTP (portion of $13.2m budget).
v.

Notes;

- Treatment at Awakeri would enable staging of the treatment works in line with rate of developments, albeit a higher cost. The alternative of pumping to Whakatane does not lend itself as well to staging so up-front capital costs would likely be higher.
- Pumpstation and bulk rising main(s) to Whakatāne WWTP (for treatment and ocean discharge). could be accompanied by wastewater pumped from Matata, pending the outcome of the scenario to develop a treatment (full or partial) and disposal facility there.
- Upgrades to Whakatāne WWTP would also require an upgraded discharge consent. The proposed national wastewater discharge standard may influence the available capacity and upgrade considerations.
- The rising main would also need new easements to be registered.
- The location of the treatment and disposal locations have not been identified for Awakeri and will be undertaken in the future. Land disposal at Awakeri will require further investigation – location, availability and cost of land need consideration.
- The vicinity of both treatment and disposal for Awakeri is presented in the following figure.

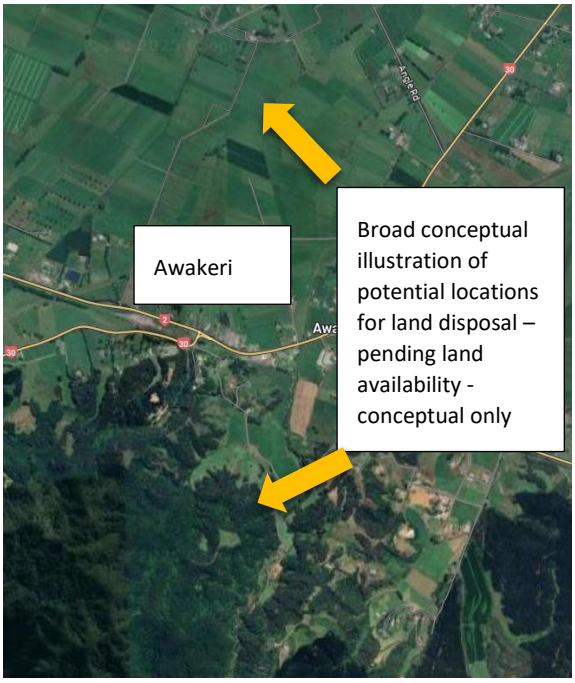


Figure 10 – Awakeri Wastewater Treatment and Disposal -vicinity only

An assessment of land disposal requirements was undertaken by Ormiston & Associates (attached in Appendix 3) – a conservative land disposal rate (3mm/d) was assumed for the estimates below. Whilst various disposal areas/options are available, location of land disposal would need to account for any flood extents, availability of suitable land (north or south of Awakeri) and cost. High level estimates are presented in the following table

Table 10 – Wastewater options assessment and cost estimate - Awakeri

Development description	No.	Unit	Cost bulk infrastructure (x1000)	Cost reticulation (x1000)	Timing	LTP Funded?
Stage 1 - STEP and Innoflow for 500 units – Innoflow STEP, retic, WWTP, land disp.	500	houses	$29,250	Incl.	ST/MT	N
Stage 2 – future development - Option 1 – grinders, small bore reticulation, new WWTP, land disposal	2,800					
Grinders systems on each site	2,800	houses		$42,500	MT/LT	N
Reticulation (small bore)	2,800	houses		$36,900	MT/LT	N
New WWTP at Awakeri – 2800 units	1747	M3/d	$24,635		MT/LT	N
Effluent disposal area 2800 units	58	ha	$ 6,406		MT/LT	N
Stage 2 – future development – Option 2 – grinders, small bore retic. (as above), pump WW to Whakatane for treatment and ocean disposal						
Rising main and P.Stn	1	sum	$11,960		ST/MT	N
Upgrade (apportion) WDC WWTP Upgrade (estimate to be confirmed)		Sum	$4,100 [2]		MT/LT	Partial

Notes;

1. *Land disposal costs only. Excludes land procurement costs. Need to add 50% reserve area for total land area required.*
2. *Assume 41% of WWTP upgrade budget ($10m).*

4.2.1.3 Awakeri Stormwater

Catchment wide approach to stormwater management will provide comprehensive guidance to the support of the residential development in the area. Awakeri is located within the Whakatāne catchment, and the surface flow is manged by the Rangitaiki Drainage scheme. The objectives of this drainage scheme include ensuring resilience during large rainfall events for the catchment and providing opportunities for rural activities to flourish. As such the development of this growth area will be supported through an SMP that reflects the flood risk and levels of service of the scheme.

A catchment wide Stormwater management plan (SMP) will include guidance as to the best practicable options for managing the effects of urban development in this currently rural area including maintaining the objectives of the flood scheme. The aspects to consider, but not limited to, within the SMP are:

- Objectives of the flood scheme
- Assessment of existing flood risk
- Green infrastructure to provide resilience to the overall management system
- Integration with other urban design outcomes
- Treatment prior to discharge of runoff
- Erosion protection
- Climate change resilience.

Development in this area will be able to discharge in the Rangitaiki Drainage scheme providing it does not compromise the objectives of the overall scheme. Therefore, the urbanisation of this area needs to be sympathetic to these outcomes.

The reticulation of urban development can be undertaken with good design outcomes; however, it is likely to have a communal element for the treatment and flow management (such as attenuation of peak flows) prior to discharge to the Rangitaiki Drainage scheme, through the Te Rahu Canal. A schematic location of such a communal device is illustrated in the following figure.

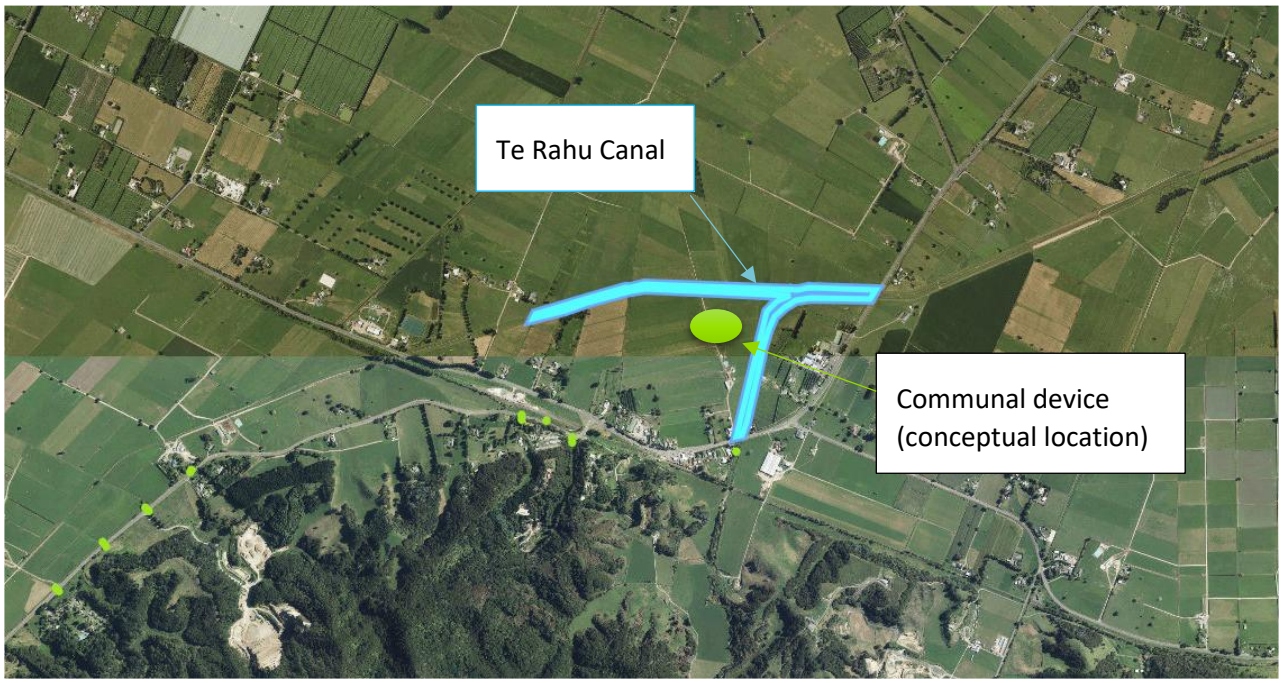


Figure 11 - Awakeri communal stormwater management device – indicative/conceptual location

While future locations of devices are unable to be presented as the urban form and location has not been developed. Stormwater management could be considered during the urban planning investigation phase of the Awakeri township for comprehensive outcomes.

A rough order assessment of the likely costs of the communal device is presented based on the Hukutaia concept design project undertaken by PDP. These costs are based on the assumption that the communal devices are apportioned to the number of lots they are supporting, and the urban development is delivered by the developer of the residential subdivision.

In addition, the costs are presented for the provision for stormwater management for the residential development, which includes reticulation that is both developer and council provided.

Table 11 – Stormwater options assessment and cost estimate - Awakeri

Development description	No.	Unit	Comments	Cost infrastructure & reticulation (x1000)	Timing	LTP Funded?
Stage 1 - estimated/assumed	500	Lots	Costs of communal device & reticulation incl. green infrastructure	$1,200 (communal wetland) $11,319 reticulation	ST/MT	N
Stage 2 (Future)	2800	Lots	Costs of communal device & reticulation incl. green infrastructure	$6,720 (communal wetland) $63,388 reticulation	MT/LT	

Notes:

1. WDC have provided guidance on the overall cost share between council and development contribution is 60 (DC)/40 (Council).
2. These costs are based on the Hukutaia stormwater management development costs presented by PDP in the August 2022 report.
3. Hukutaia stormwater management includes conveyance swales and other green infrastructure which would be similar in approach to an Awakeri growth development strategy SMP.

4.2.2 Te Teko

4.2.2.1 Water Supply

The current water supply is from the TeTeko WTP and reservoir, however Te Teko reticulation is also linked to the Plains scheme via supply from Paul Road. If significant development occurs in Te Teko, reticulation will be required for newly developed areas, and the bulk supply and storage will need upgrading, comprising;

- Upgrade (or new) pipeline from Otumahi reservoir (Paul Road) to Te Teko, estimated to be 7km of 200ID (250ODPE), supplemented by existing feeds which can be retained as alternatives/ contingencies.
- Additional 4Ml storage reservoir at Te Teko (currently planned). Elevation of the reservoir would provide adequate pressure for reticulation.
- Upgrade bore (short term resilience)

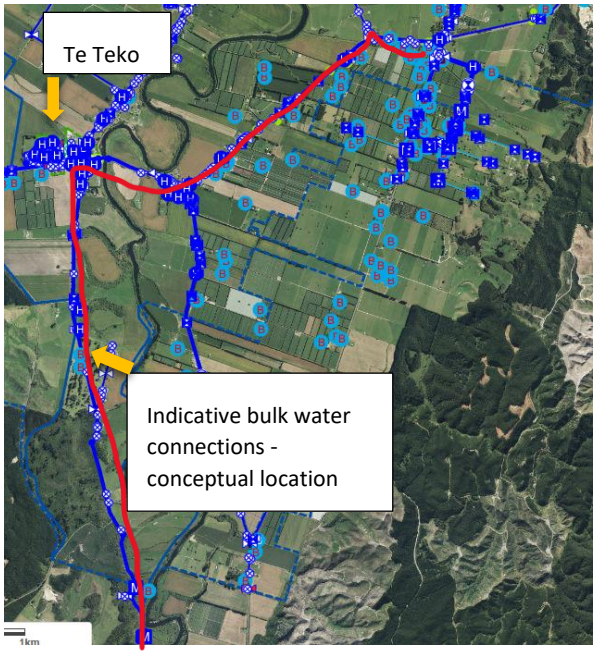


Figure 12 – Illustration of Potential Dedicated Te Teko Connection to Paul Rd reservoir

Rough order costings are presented below.

Table 12 – Water options assessment and cost estimate – Te Teko

Development description	No.	Unit	Cost bulk infrastructure (x1000)	Cost reticulation (x1000)	Timing	LTP Funded?
Reticulation 3300 houses	3300	No.		$17,160	MT/LT	N
Upgrade reservoir 4Ml	1	No.	$4,371		MT	Y[1]
Upgrade existing 100DN link to Otumahi system – 7 km of 200DN pipe to junction	7	km	$3,786		MT	N
Link WTP and reservoir	1	Sum	$3,060		ST/MT	Y
Upgrade bore	1	Sum	$546[2]		ST/MT	N

1. *This requires confirmation – possibly installed*
2. *Short term – longer term upgrade the link to Otumahi*

4.2.2.2 Wastewater

- Te Teko is currently serviced by septic tanks, therefore significant land development will require reticulation (similar staging assumptions to Awakeri could be adopted), as well as treatment and disposal at Te Teko, pending land availability.
- Alternatively, WW could be pumped to another WWTP. In this case, unless Awakeri was also developed and a WWTP built there, this would likely be Kawerau (which has capacity) – in which case a plan change would be required for this to occur as it is currently a prohibited activity under the Regional Tarawera River Catchment Plan. This requires confirmation by the BOPRC.

An illustration of the potential area for land disposal is presented in the following figure, this is not confirmed as yet and to be considered further during the next phase of the growth area options assessment.

Figure 13 – Te Teko Wastewater – Illustration of WWTP and Disposal Area

High level cost estimates are presented in the following table.

Table 13 – Wastewater options assessment and cost estimate – Te Teko

Development description	No.	Unit	Cost bulk infrastructure (x1000)	Cost reticulation (x1000)	Timing	LTP Funded?
Reticulation	3,300[2]	houses		$34,820	MT/LT	N
Pump to Kawerau			$9,091		MT/LT	N
Plan change for above			$300 [1]		ST/MT	N
Alternatively, new WWTP at Te Teko			$29,623		MT/LT	N
Plus, land disposal (69ha + reserve area.) at Te Teko			$7,550		MT/LT	N

Note;

1 – CKL estimate in discussion with WDC

2 – A similar staged approach adopted for Awakeri (including small bore reticulation and STEP/grinder systems) could be considered for Te Teko as well.

4.2.2.3 Te Teko Stormwater

As with the previous growth areas which are predominantly greenfield areas, a catchment wide approach to stormwater management is recommended to support the residential development in the area.

It is to be noted that Te Teko is located downstream of Matahina Dam which has a zone of influence during a dam breach situation. This specific hazard assessment is not included within this 3 Waters Report.

A catchment wide stormwater management plan (SMP) will include guidance as to the best practicable options for managing the effects of urban development and integrate with the current residential development which is centred around the school and rural type road networks. The aspects to consider are:

- Objectives of the flood scheme
- Assessment of flood risk including any downstream impacts
- Green infrastructure to provide resilience to the overall management system
- Integration with other urban design outcomes
- Treatment prior to discharge of runoff
- Erosion protection
- Climate (change) resilience.

Te Teko is within the top of the Rangitaiki drainage scheme therefore has the opportunity to discharge stormwater runoff to the scheme's canals or the Rangitikei River itself. However, the future residential development needs to ensure that the objectives of the scheme are honoured. The objectives of this scheme include resilience during large rainfall events, providing opportunities for rural activities to flourish and provide land drainage functions at agreed levels of service. The urbanisation of this area needs to be sympathetic to these outcomes.

Should the discharge (of stormwater runoff) be to the Rangitaiki River itself the discharge may need to be pumped due to the presence of stop banks for this river should gravity discharge option not be present. Alternatively, a floodgate discharge regime could be implemented however large storage behind the stop banks would be required to ensure the discharge is achieved during high flow times within the river, this reflects the hydraulic balance between discharge with high tailwater conditions.

There are areas of Te Teko that are located at higher elevations. If the development occurs in these higher elevated areas gravity discharge without pump stations and/or floodgates maybe an option. This discharge assessment would occur during the development of a catchment wide SMP.

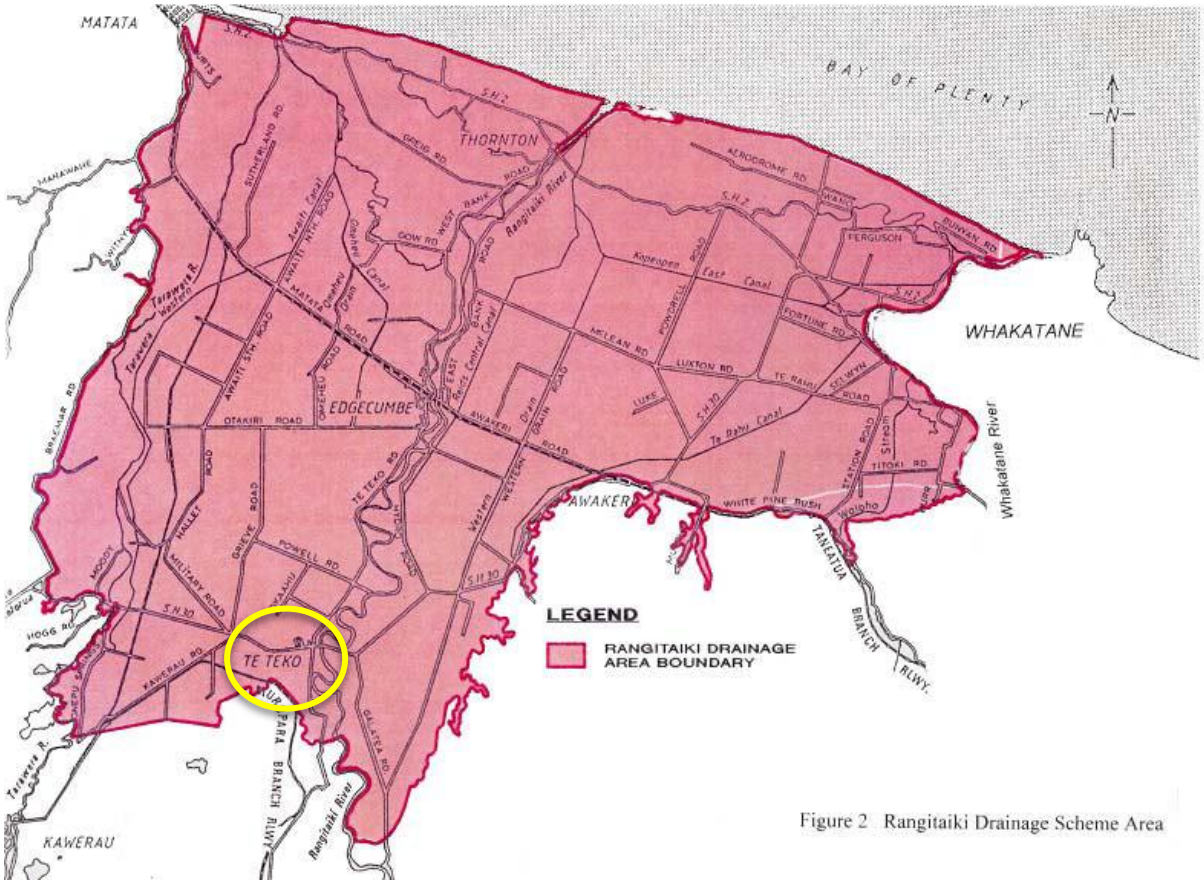


Figure 14 - Rangitaiki drainage scheme -Te Teko location

The reticulation of the proposed urban development can be undertaken with good design outcomes; however, it is likely to need to have a communal element for the treatment and flow management (such as attenuation of peak flows) prior to discharge to the Rangitaiki Drainage scheme. Due to the nature of the current urban outcomes, and solely for the purpose of this assessment, this assessment proposes a new urban form adjacent and surrounding the current settlement. Therefore, it is likely there are several communal devices for this urban outcome, however this can be confirmed if the urban form is developed further. A schematic location of communal devices is illustrated in the following figure, which would require confirmation through subsequent planning activities.

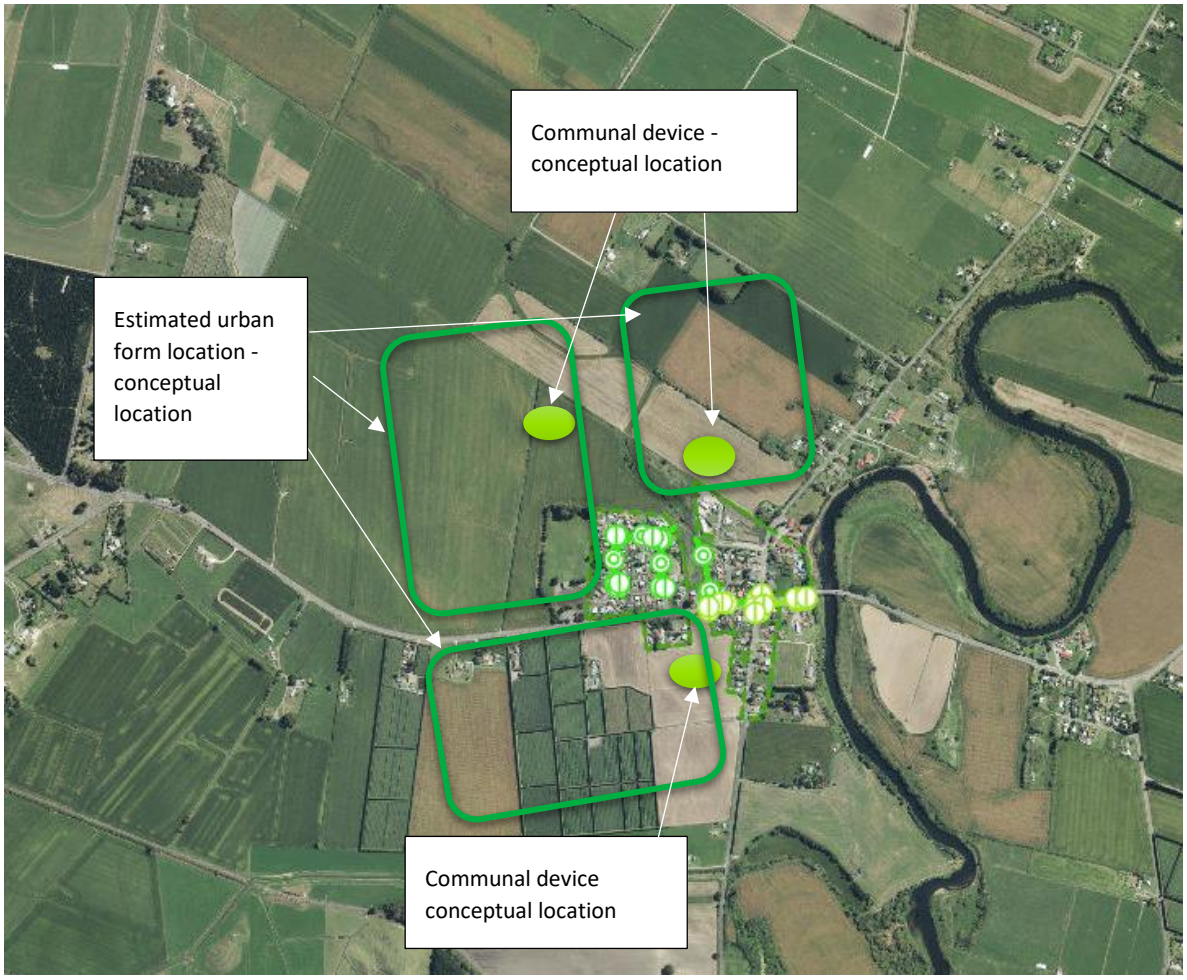


Figure 15 - Schematic stormwater management - Te Teko

A rough order assessment of the likely costs is presented for the provision of stormwater management to support the residential development, which includes reticulation and communal devices that is both developer and council provided. These costs are based on the Hukutaia stormwater management development costs presented by PDP in the August 2022 report. These costs assume that the communal devices and reticulation are apportioned to the number of lots they are supporting, and the urban development is delivered by the developer of the residential subdivision.

Table 14 – Stormwater options assessment and cost estimate – Te Teko

Development description	No.	Unit	Comments	Cost bulk infrastructure & reticulation (x1000)	Timing	LTP Funded?
Council costs for communal devices only	3,300	Lots	Costs of the communal devices only	$7,920	MT/LT	N
Developer and council costs for stormwater management[1]	3,300	Lots	Total costs including reticulation and communal devices	$82,627	MT/LT	N

Notes:

1. WDC have provided guidance on the overall cost share between council and development contribution is 60 (DC)/40 (Council).
2. Hukutaia stormwater management includes conveyance swales and other green infrastructure which would be a similar approach to Te Teko growth development strategy SMP.

4.2.3 Matata

Development in Matata is partially dependant on approval and construction of the proposed WWTP to treat WW from 400 houses (260 existing, 140 new) in the short term and an additional (say 500) in the medium term. There is also available land to the east of town, suitably elevated to accommodate further growth – assumed to be an additional 600 units for this assessment.

Below is an assessment of the water and wastewater implications, should this development proceed.

4.2.3.1 Water Supply

Development options include upgrading the existing supply from Jennings and/or supplementary supply from Braemar in future, if required (not currently considered).

Short-Medium term – Upgrade existing infrastructure for 140 new houses and infill 260 (total 400) houses (assumed within next 5 yrs):

- Upgrade Jennings WTP (assume this is complete).
- Upgrade storage (short term).

Medium/long term – additional 1,100 lots (infill and new area east of town):

- Connection (estimated 4km of 150DN pipe) to Braemar scheme via Braemar road-Matata Jennings line).
- Upgrade storage – assumed to be 1Ml.
- Upgrade water supply reticulation.

An illustration of the optional/potential future connection to the Braemar Scheme is presented below.

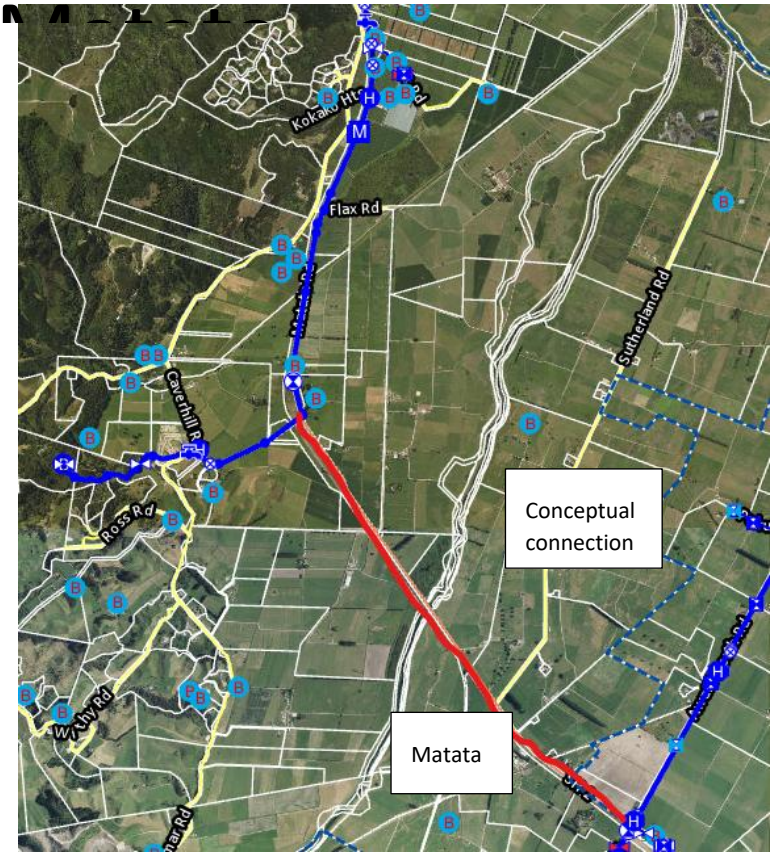


Figure 16 – Matata water supply upgrades –conceptual future connection to Braemar Scheme

Rough order costings for this scheme are presented below.

Table 15– Water options assessment and cost estimate - Matata

Development description	No.	Unit	Cost bulk infrastructure (x1000)	Cost reticulation (x1000)	Timing	LTP Funded?
Stage 1 - Current infill – retic + add storage – cater for 260+140=400 units	400	houses				
Upgraded storage	229	kl	$208		ST/MT	
Reticulation				$728	ST/MT	
Stage 2 – additional 500 infill – integrate with Braemar for stage 2 and 3 growth.						
Upgraded storage	229	kl	$371		MT	
Reticulation				$2,600	MT	
Link to Braemar scheme (4km 200DN)	4000	m	$2,163		MT/LT	
Stage 3 – Additional 600 houses – new area east of town						
Upgraded storage	229	kl	$404		LT	
Reticulation				$3,120	LT	

4.2.3.2 Wastewater

Installation of a new WWTP and disposal area is currently planned, pending availability of land disposal area and funding. It is assumed that the discharge of treated WW to river/ocean is not an option.

In line with the above, a staged reticulation and treatment approach has been adopted as follows;

Stage 1 – 400 units (260 infill + 140 new):

- Assume only new houses serviced.
- Adopt a small-bore sewer reticulation and package treatment plant/disposal approach – e.g. Innoflow or similar.
- Developer to install STEP tanks and small-bore reticulation.
- Council will install a bulk pipeline to the WWTP, the modular treatment plant and land disposal.

Stage 2 – assume 500 further infill units:

- As above, developer installs STEP tanks and reticulation, council installs additional treatment plant modules.

Stage 2 – additional 600 new (greenfields) units to the east of town:

- As above, developer installs STEP tanks and reticulation.
- Council installs bulk main to treatment plant (located east of town) as well as new package treatment plant and land disposal.

It is noted that, should development occur at a higher rate than anticipated, Stages 2 and 3 could be combined and a traditional WWTP and land disposal system implemented to realise benefits of scale (lower costs).

An alternative option to consider could include pumping wastewater (treated, partially treated or raw) from Matata to Whakatāne (via Edgecumbe and potentially including Edgecumbe effluent) for further treatment and disposal. This will have an impact on Whakatāne treatment and disposal capacity and upgrading.

A further alternative consideration could be to assess the option to receive raw or semi treated effluent from Edgecumbe for treatment and disposal at Matata. In this case appropriate agreements and contributions to be considered and the staging and treatment plant/land disposal sizing would need review.

The indicative location of a possible wastewater catchment is illustrated in the figure below

Figure 17 – Matata wastewater – Eastern Area being considered for development

High level cost estimate for the Wastewater options are presented in the following table.

Table 16 – Wastewater options assessment and cost estimate - Matata

Development description	No.	Unit	Cost bulk infrastructure (x1000)	Cost reticulation (x1000)	Timing	LTP Funded
Stage 1 – 140 new houses – STEP tanks	140	houses		4,004	ST/MT	N
Stage 1 – Small bore reticulation	140	houses		$1,820	ST/MT	N
Stage 1 – bulk main to Innoflow Plant	1	sum	$1,000		ST/MT	N
Stage 1 - Innoflow WWTP module 1	400	houses	3,900		ST/MT	N
Stage 2 – 500 infill units – STEP Tanks	500	houses		$14,300	MT/LT	
Stage 2 – Small bore reticulation	500	houses		$6,500	MT/LT	N
Stage 2 - Innoflow WWTP module 2	500	houses	$4,875		MT/LT	N
Stage 3 – 600 infill units – STEP Tanks	600	houses		$15,444	LT	N
Stage 3 – Small bore reticulation	600	houses		$7,800	LT	N
Stage 3 – bulk main to Innoflow Plant	1	sum	$1,000		LT	N
Stage 3 - Innoflow WWTP – new, east of town	600	houses	$5,850		LT	N

4.2.3.3 Stormwater

The stormwater assessment is cognisant that infill within the existing Matata township can occur under current District Plan zoning once Wastewater provisions are in place, as outlined above. Therefore, this assessment considers that wastewater servicing is not compromising infill potential within the Matata Township.

The development of the eastern area of Matata would benefit from the catchment wide approach to stormwater and flood management, which integrates with urban planning for resilient outcomes for this growth area.

Areas to the east of the existing township are located partly within the Rangitaiki drainage scheme and could discharge to the Tarawera River. However, should the future residential development discharge to the Tarawera River this discharge would need to be treated and designed to have climate change factors included, such as sea level rise and tailwater conditions during high flow to provide resilience to the overall reticulation and management system.

It is likely that the existing stormwater management system can be upgraded to include township infill outcomes in a comprehensive way to accommodate the increase runoff with respect to protecting the receiving environment of detrimental effects.

However, any development that occurs which discharges to the Te Awa o Te Atua Wildlife Management Reserve, and the Te Awa o Te Atua (Matata Lagoon) would need to liaise with Tarawera Awa Restoration Strategy group, the Joint Advisory Committee - which includes DOC, Ngāti Tūwharetoa ki Kawerau and Ngāti Awa, who administer the management of the wetlands behind the Matata dunes.

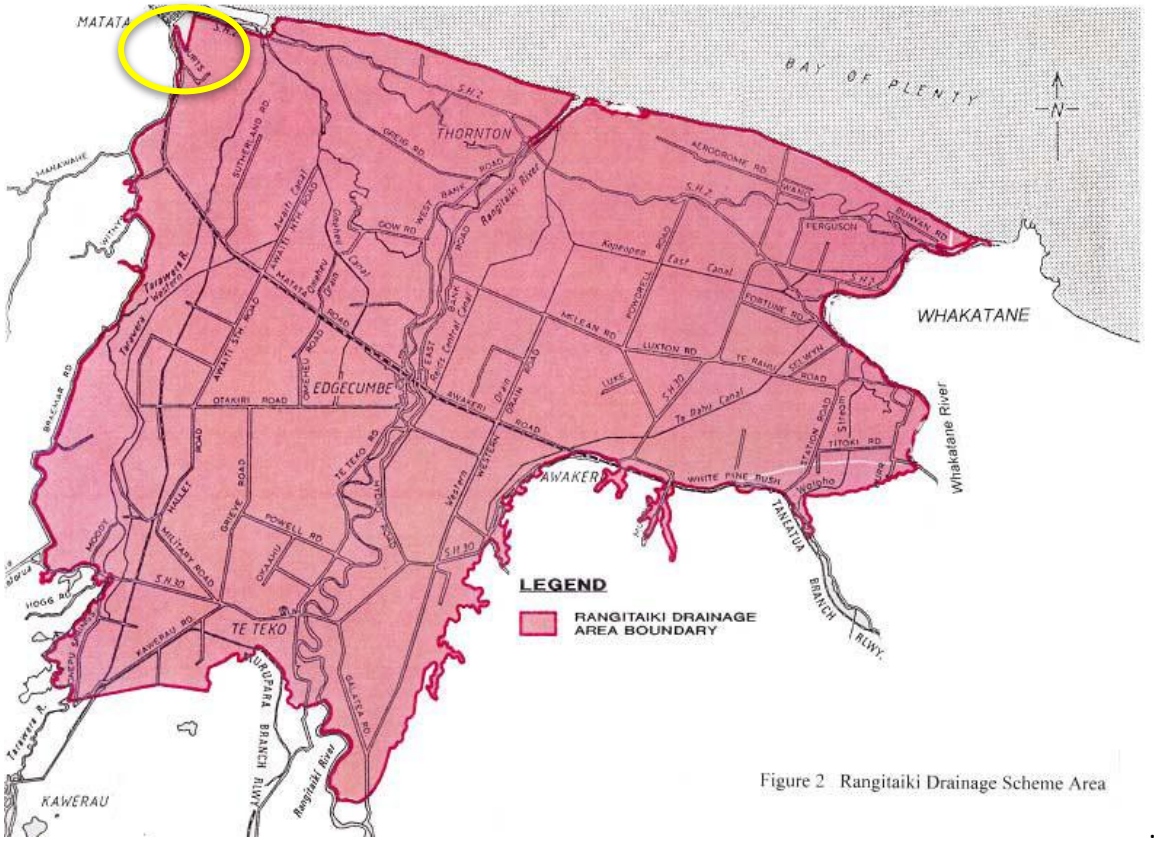


Figure 18 - Rangitaiki drainage scheme, - East Matata location

The stormwater management to support the proposed urban development can be undertaken with catchment wide SMP approach. It is likely to have a communal element for the treatment however unlikely to include flow management as part of the area east of Matata is located at the base of the contributing catchment and subject to tidal conditions. A schematic location of communal devices is illustrated in the following figure, which can be confirmed and refined once the urban form is developed in the future.

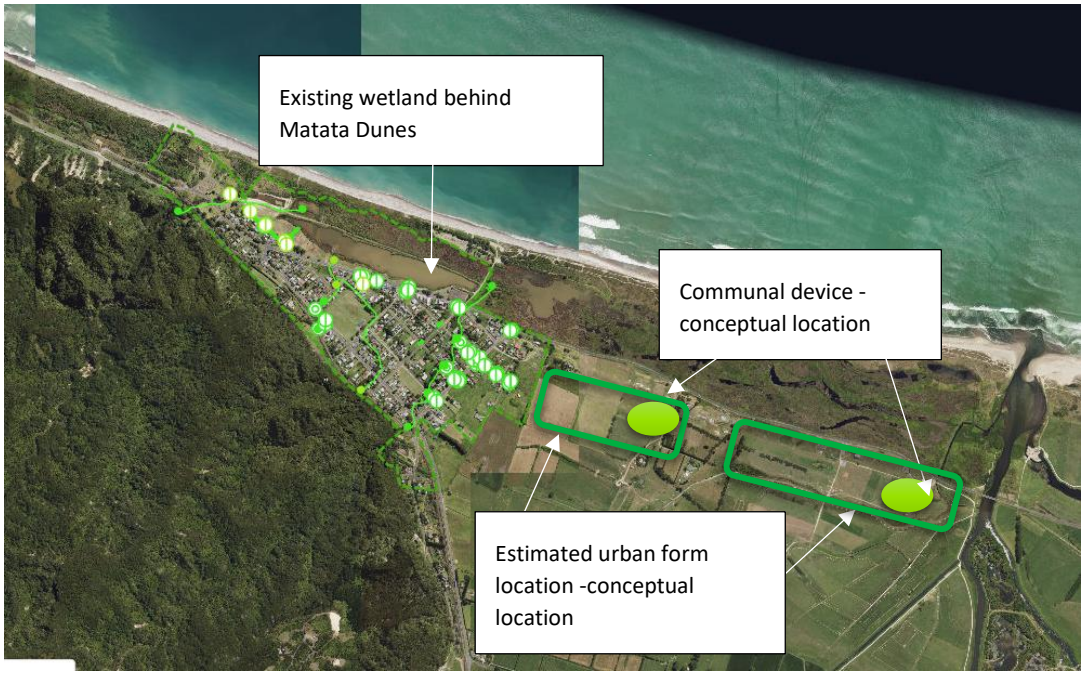


Figure 19 - Matata stormwater management schematic

A high-level assessment of the likely costs is presented, Tabel 17, for the provision of stormwater management for the residential development, which includes reticulation and communal devices that is both developer and council provided for the east Matata area only.

The projected growth is with respect to infill within the Matata current township spatial area, of 140 lots in the short term and additional 500 Lots in the medium term. It is assumed that the infill of the Matata Township can be accommodated within the existing system with minor upgrade associated with reticulation and communal treatment facilities.

The long-term aspiration is to consider 600 Lots to the east of the township to which a separate stormwater system would be developed.

Table 17 – Stormwater options assessment and cost estimate– East Matata

Development description	No.	Unit	Comments	Cost reticulation & bulk infrastructure (x1000)	Timing	LTP Funded?
Stage 1&2 -infill and new within the Township	640	Lots	Total costs including reticulation and upgrade of existing system	$7,244[1]	ST/MT	N
Stage 2 east of Matata township	600	Lots	Total costs including reticulation and communal devices	$15,023 total $1,440 (wetland) $13,583 (reticulation)	LT	N

Notes:

1. Assumes that there is a level of upgrade to the existing system required to support the total lots, costs are based on Hukutaia costs of reticulation only at 50% of the system being upgraded.

These costs are based on the Hukutaia stormwater management development costs presented by PDP in the August 2022 report. It has been assumed that the communal devices and reticulation are apportioned to the number of lots they are supporting, with respect to cost.

4.2.4 Whakatāne Infill

4.2.4.1 Water Supply

Development of infill options includes various upgrades to WTP's, reservoirs and pipelines. In addition to this, an option currently under consideration is to bring water in from Otumahi (Paul Rd) via a new **primary trunk main** system to add resilience to the Whakatāne future supply and also supplement the Plains/ Coastlands supply. The benefits stretch beyond Whakatāne and Ohope (added resilience) to Awakeri and other areas in the Plains. The proposed (ref McKenzie, Water Supply Strategy) 10Ml eastern reservoir would, in the longer term, work in conjunction with this option.

There is also a consideration to build an alternative (or combined with the primary trunk main) secondary trunk main from Braemar to Coastlands (and potentially Whenua West of Coastlands), providing additional supplementation to the Plains and including papakāinga development in this area.

The following figure shows the Whakatāne water network layout, including the Coastlands servicing.

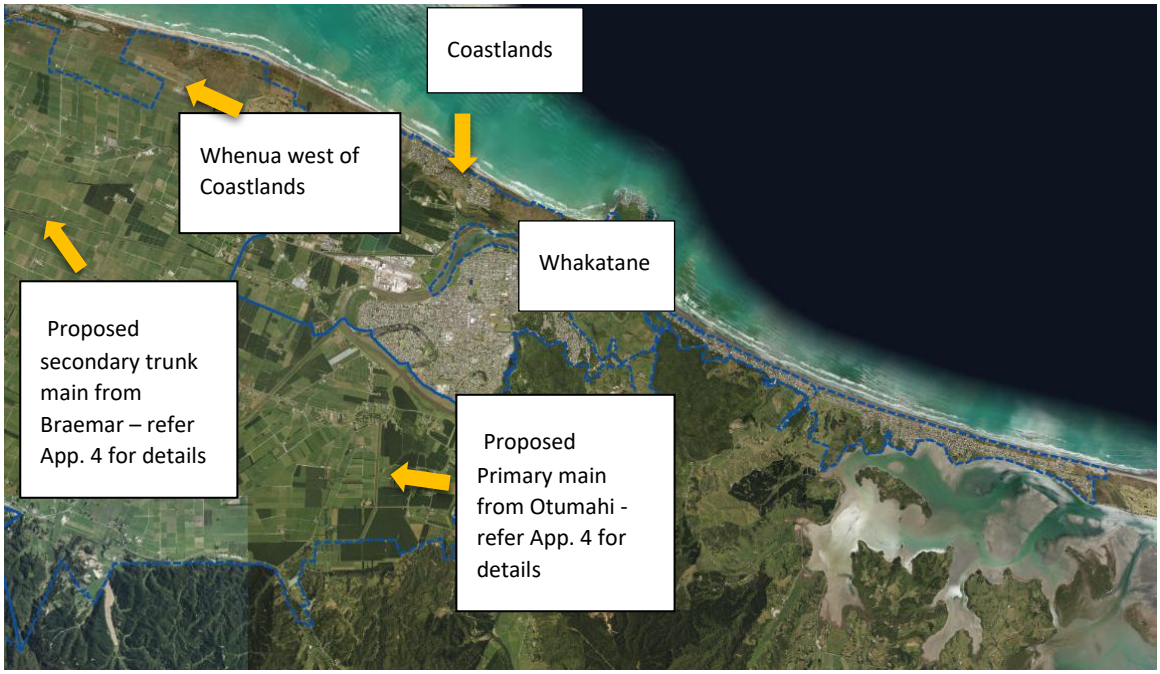


Figure 20 – Whakatāne Water Network Layout – incl. Coastlands

It has been assumed that the cost of the Otumahi WTP upgrade and primary main be apportioned pro-rata between Awakeri and Whakatane – 41%/59% respectively, based on number of properties served (3,300 Awakeri, 8,000 Whakatane/Ohope).

The estimates below, Table 18, mostly relate to added resilience and are extracted (and escalated) from McKenzie Consulting conceptual cost estimates. Costs exclude additional/upgraded reticulation to accommodate this as this may be included in WDC renewals/upgrading budget (LTP).

The figures presented below, within Table 18 need verification by WDC and also confirmation of inclusion in the LTP.

Table 18 – Water options assessment and cost estimate - Whakatāne

Development description	No.	Unit	Cost bulk infrastructure (x1000)	Cost reticulation (x1000)	Timing	LTP Funded?
Upgrade Otumahi WTP	1	sum	$7,788		MT	
Otumahi reservoir (current)	1	sum	$4,000		ST	Y
Primary main to Whakatāne WTP (59% apportionment of total cost)	1	sum	$18,799		MT/LT	
Secondary trunk main (Braemar to Coastlands)	1	sum	$24,145		LT	
Pipe link from E Reservoir	1	sum	$3,344		LT	
E Reservoir	1	sum	$6,556		LT	
Decommission Whakatāne WTP	1	sum	$1,639		LT	
Other -est. – valves, connections	1	sum	$546		MT/LT	
Boosters x 2	1	sum	$2,731		MT/LT	

4.2.4.2 Wastewater

The Whakatāne WWTP currently has capacity. However, provision is being made for future upgrading of the plant to cater for growth - extent to be confirmed pending projected inflows and also pending the introduction of the national wastewater quality and discharge standards (currently being formalised by Taumata Arowai).

As discussed under Awakeri options and the water supply section above, costs for upgrading the WDC WWTP ($13,2m) have been apportioned between Whakatane/Ohope and Awakeri.

An option to pump Awakeri wastewater to Whakatāne for treatment and disposal to ocean, as opposed to developing a new WWTP at Awakeri has also been considered. The estimate below includes this option. A PV assessment is recommended to evaluate and compare options – this is also discussed under Awakeri's assessment.

No costs have been estimated for Whakatane infill reticulation upgrades at this point as the extent, and implications on the network require further assessment. The requirement for upgrading the WWTP is also excluded as the extent will depend on infill as well as other developments referred to in this assessment, such as Whenua West of Coastlands and Awakeri.

The following figure shows the layout of the current Wastewater reticulation for Whakatāne, Ohope and Coastlands including the location of the treatment plant.

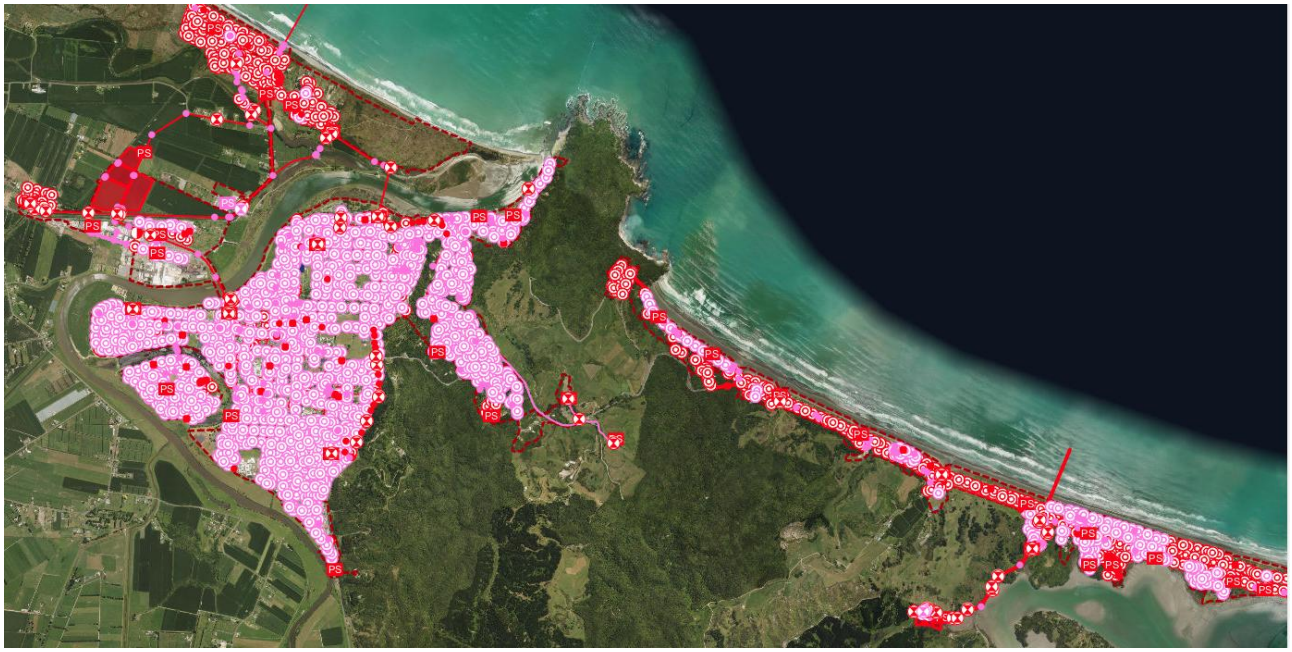


Figure 21 – Whakatāne Wastewater Reticulation and location of WWTP

4.2.4.3 Stormwater

The stormwater management network within the existing Whakatāne township extents is under review, with respect to providing a level of service that is acceptable to the provider and residents. There are river protection projects underway that also address groundwater interaction, with the outcomes to be incorporated into future infill development opportunities.

Notwithstanding the above investigations and projects, it is to be acknowledged that the Whakatāne township sits within the Whakatāne -Tauranga River catchments and the flood risk is being considered throughout the course of the Spatial Plan Project.

Resilience of the stormwater system is currently underway with the pumpstations within the township being upgraded or assessed for capacity given the effects of climate change.

4.2.5 Kopeopeo Infill

4.2.5.1 Water Supply

Water supply to the Kopeopeo area is shown in the following figure.

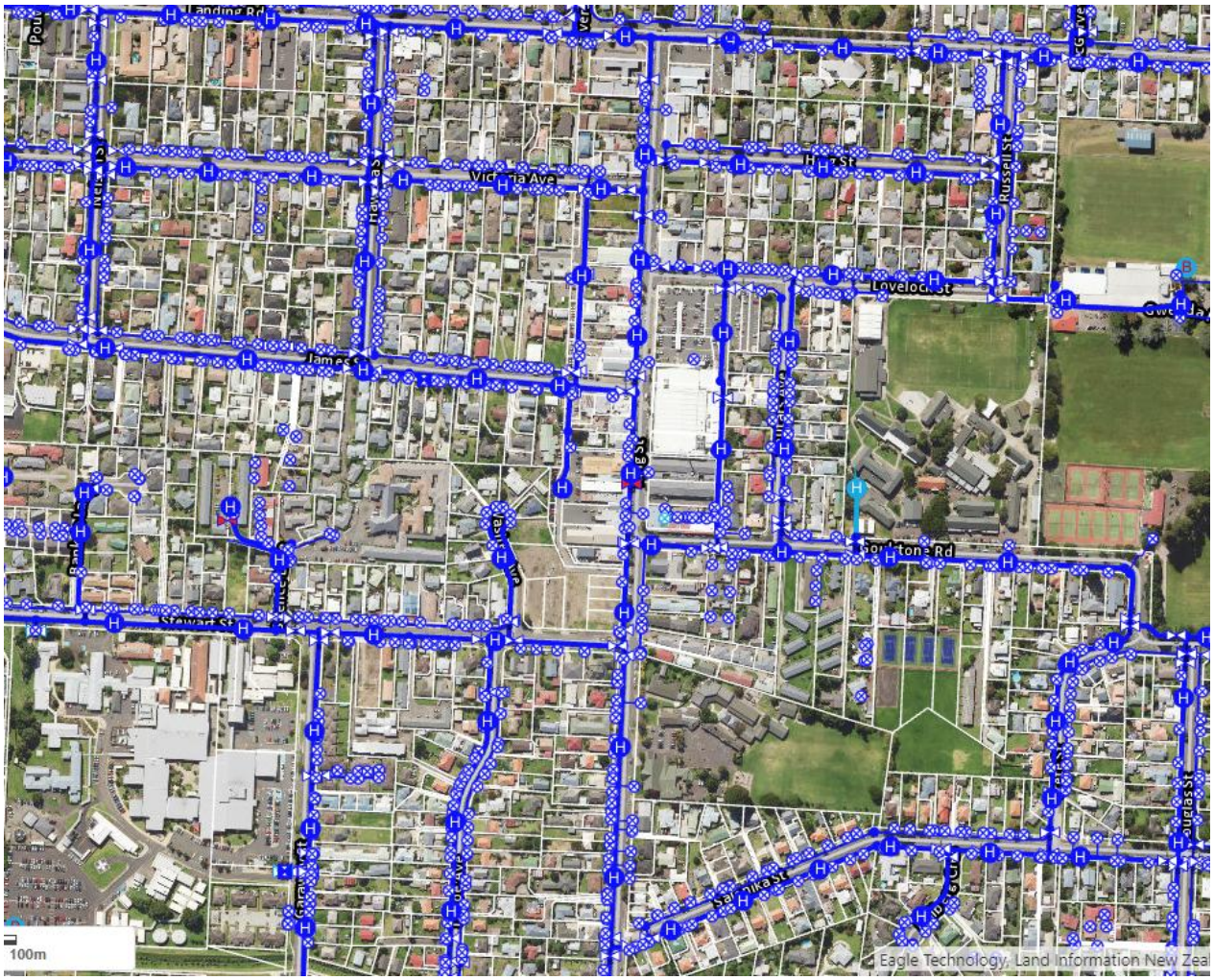


Figure 22 – Kopeopeo Water Reticulation

Key features of the reticulation are;

- Most of the reticulation comprises 100DN PVC and 50DN PVC rider mains. Pending development/ infill/ densification of Kopeopeo, reticulation may require upgrading to cope with additional demand.
- Trunk mains along Domain, down King, James and Stewart roads comprise 200DN AC (asbestos cement) pipes. Pending condition, these AC lines may presumably be nearing end of life. Pending development/infill/densification of Kopeopeo, these mains could be upgraded to PE or PVC.

4.2.5.2 Wastewater

Wastewater reticulation for the Kopeopeo area is shown in the following figure.

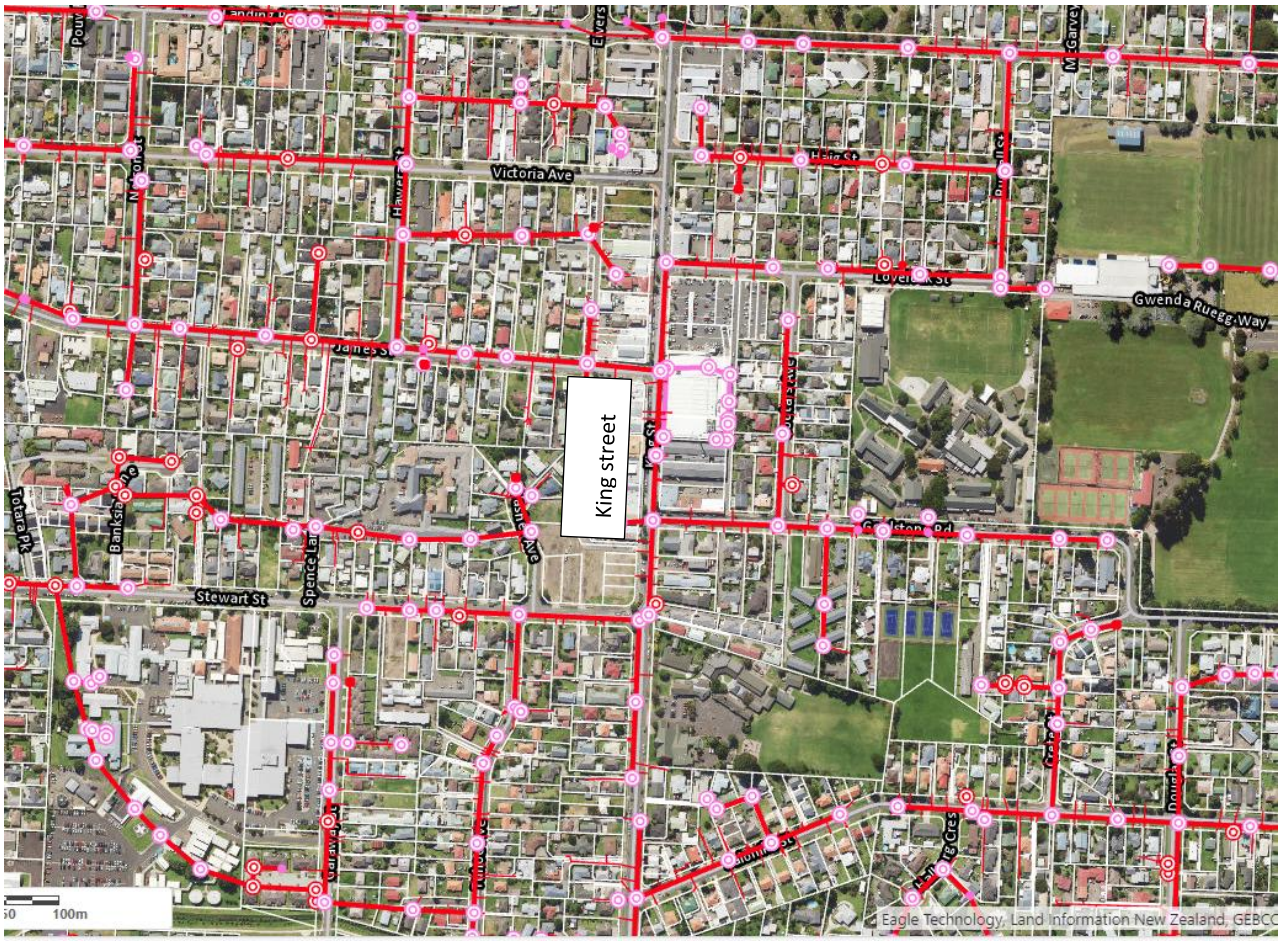


Figure 23 – Whakatāne Wastewater Reticulation

Most of the infrastructure comprises 150DN to 225DN (PVC and AC) reticulation feeding to a pumpstation and 300DN rising main to the treatment ponds.

Understandings of capacities and condition of pumps and rising main are currently being developed. However, the latter should be capable of conveying approximately 100l/s. Upgrades should best be assessed by more detailed modelling.

Whilst it is understood that the Whakatāne WWTP has spare capacity to receive WW from growth in this area, this needs to be evaluated in the broader context with other options, discussed above.

4.2.5.3 Stormwater

Kopeopeo infill area is at a slightly higher elevation than the Whakatāne CBD area, with the stormwater network that includes a pumped discharge to the Whakatāne River. The following figure shows the current stormwater piped network.

Figure 24 – Whakatāne Stormwater Reticulation

Stormwater reticulation for the Kopeopeo area is shown in Figure 24 above. The Kopeopeo stormwater service assessment has similar outcomes to the Whakatāne infill options, which is summarised as follows:

- Network within the identified infill extents is under review, with respect to providing a level of service that is acceptable to the provider and residents.
- Network discharges through a pumpstation to the Whakatāne River, which is part of the overall drainage scheme for the township
- Whakatāne township, including the Kopeopeo infill growth area, sits within the Whakatāne - Tauranga River catchments
- Hazards of flood and other elements are considered throughout the course of the Spatial Plan Project.

4.2.6 Thornton Dunes

4.2.6.1 Water Supply

Thornton is fed by a 50DN watermain. Whilst this could continue to serve the rural lifestyle development (rain harvesting, self-sufficiency), should significant growth happen here, the option could be considered to install a larger water main to a larger main to accommodate additional potable and fire water supply as well additional storage and boosters It is assumed that a 100DN water main would feed water to Thornton along a similar route to the current.

Table 19 – Water supply options assessment and cost estimate– Thornton

Development description	No.	Unit	Cost bulk infrastructure (x1000)	Cost reticulation (x1000)	Timing	LTP Funded?
New 100DN water main	2	km	$468	n/a	MT/LT	N
Storage and boosting	1	sum	$260	n/a	MT/LT	N

The following figure illustrates the possible water main upgrade.

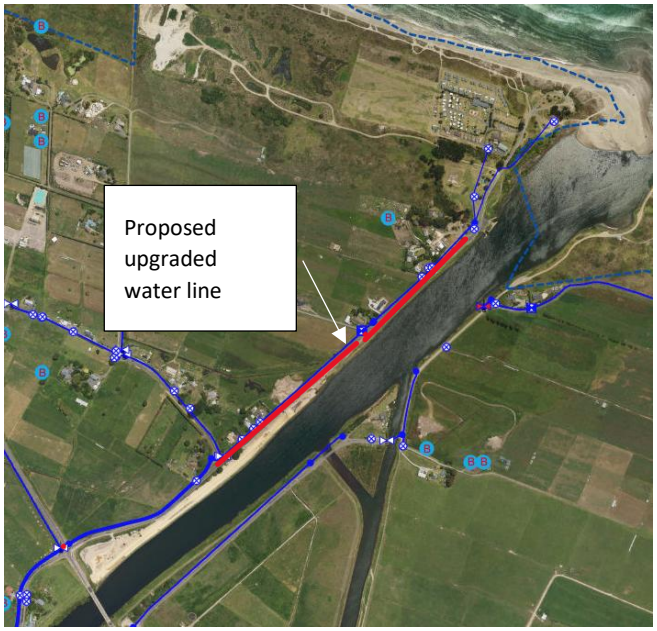


Figure 25 – Thornton Water Upgrade

4.2.6.2 Wastewater

Thornton is currently serviced by individual septic tanks. The area is remote and not easily connected to any other scheme or treatment facility. Pending growth (residents and holiday visitors), the septic tanks regime could be retained, or, pending growth, consideration could be given to a WW treatment package plant installed together with reticulation.

Rough order costs are provided in the following table.

Table 20 – Wastewater options assessment and cost estimate– Thornton

Development description	No.	Unit	Cost bulk infrastructure (x1000)	Cost reticulation (x1000)	Timing	LTP Funded?
Package Plant	1	sum	$630		MT/LT	N
Reticulation to all houses	est.[1]	sum		$702	MT/LT	N

Note:

1. Broadly estimated at 3000m (3km) of reticulation.

4.2.6.3 Stormwater

The rural residential development within the Thorton Dunes location would benefit from a catchment wide approach to stormwater management. A catchment wide Stormwater Management Plan (SMP) will include guidance as to the best practicable options for managing the effects of rural residential development din this currently rural area. The aspects to consider are:

- Onsite management of runoff to mitigate effects on receiving environs
- Treatment prior to discharge of runoff
- Erosion protection
- Climate (change) resilience.

The Thornton Dunes area is within the Rangitaiki Drainage scheme and adjacent to the Rangitaiki River. The area is in the lower area of the Rangitaiki River therefore subjected to the effects of climate change and sea level rise.

Development within this area will require landowners to undertake the stormwater management provisions at their own cost therefore costs have not been assessed for this report.

4.2.7 Whenua West of Coastlands

This area comprises approximately 130ha of land. Although development considerations are still underway, it is expected that approximately 1730 (refer WDC NASH assessment, April 2025) lots could be developed at Whenua West of Coastlands.

4.2.7.1 Water

This development could be serviced with bulk water from the existing Whakatāne reticulation in the short term. In the longer term pending the development of the secondary water main from Braemar, this could be an alternative source, free up capacity in the Whakatāne network. WDC have recently undertaken cost estimates for water supply to this area, as depicted in the table below.

Table 21 – Water supply options assessment and cost estimate – Whenua West of Coastlands

Development description	No.	Unit	Cost bulk infrastructure (x1000)	Cost reticulation (x1000)	Timing	LTP Funded?
Bulk cost estimate (NASH - WDC)			$4,683		MT/LT	Y
Reticulation estimate	1730	No.		$8,966	MT/LT	N

The area for potential development is illustrated in the following figure, along with the existing Whakatāne water supply reticulation for the areas adjacent to this potential growth area.

Figure 26 – Whenua West of Coastlands –Existing adjacent Water reticulation

4.2.7.2 Wastewater

Wastewater could be reticulated to the existing Whakatāne wastewater treatment plant (ponds) which is understood to have capacity. As noted above, this should be evaluated in the broader context, considering options to also potentially convey and treat/dispose of WW from Awakeri/other. THE costs presented in the following table are for the costs associated with ultising the Whakatāne wastewater treatment plant.

Table 22 – Wastewater options assessment and cost estimate– Whenua West of Coastlands

Development description	No.	Unit	Cost bulk infrastructure (x1000)	Cost reticulation (x1000)	Timing	LTP Funded?
Bulk reticulation, convey to WDC WWTP – refer NASH report (WDC, 2025)	1	Sum	$8,835		MT/LT	Y
Reticulation to all houses	1730			17,992	MT/LT	N

Development area of Whenua West of Coastlands could be serviced by a potential bulk wastewater reticulation upgrade. A schematic of this is shown in the figure below which has been supplied by WDC.

Figure 27 – Whenua West of Coastlands – Potential development area & WW Upgrade schematic

4.2.7.3 Stormwater

The development of the Whenua West of Coastlands area would benefit from developing a growth area stormwater management plan (SMP) which also reflects the coastal nature of this location as well as the effects of climate change. This approach to stormwater management will integrate urban planning to ensure there are multiple uses for greenspaces.

It is to be noted that this growth area is located within the Rangitaiki drainage scheme (refer to Figure below) and could discharge to the Orini Canal, however investigation into the capacity of this channel during rainfall events would need to be undertaken.

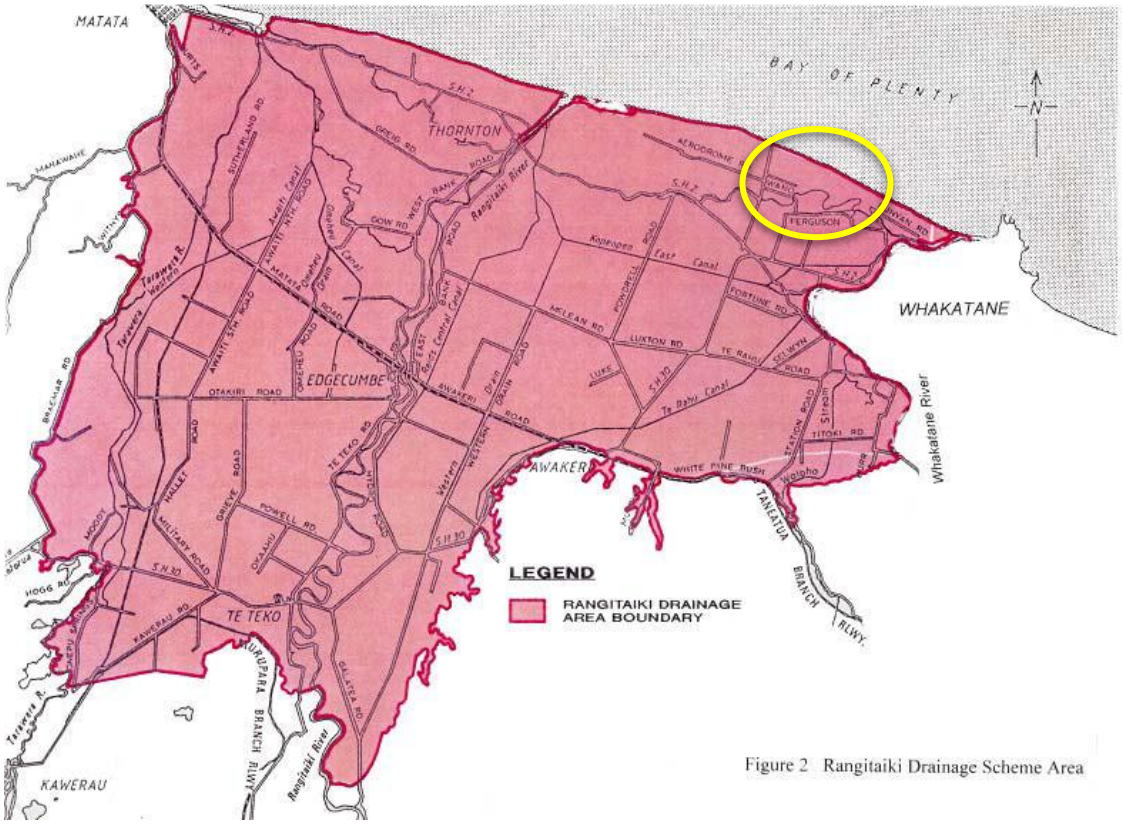


Figure 28 - Rangitaiki drainage area boundary, with Whenua West of Coastlands location

The stormwater management system to support the proposed urban development, which incorporates the strategic goals of sustainability and resilience, is likely to have a communal element for the treatment. This communal device approach is likely to include soakage as a discharge regime, as such the volume associated with these communal devices are reliant on the infiltration capacity of the underlaying soils. This stormwater management system is currently utilised in the neighbouring Coastlands. The management of the larger rainfall events will have a surface flow conveyance system to provide a resilient outcome. The receiving environment includes remnant stream bed which discharges to the Orini Canal. It is to be noted that the Orini Canal has tidal controls downstream.

A schematic location of communal devices, which are in the lower elevation areas, is illustrated in the following figure. These are schematic locations which can be confirmed and refined once the urban form is developed in the future.

Figure 29 – Whenua West of Coastlands Stormwater communal device – conceptual layout

A high-level assessment of the likely costs is presented in the following table, for the provision for stormwater management for the residential development, which includes reticulation and communal devices that is both developer and council provided.

Table 23 - Stormwater options assessment and cost estimate - Whenua West of Coastlands

Development description	No.	Unit	Cost bulk infrastructure (x1000)	Cost reticulation (x1000)	Timing	LTP Funded?
Council costs for communal devices only	1,730	Lots	communal devices only	$4,152	MT/LT	N
Developer and council costs for stormwater management	1,730	Lots	Total costs including reticulation and communal devices	$43,316	MT/LT	N

4.3 Kawerau

Sufficient water source/supply is available for infill and further development e.g. Roy Stoneham Park. Should further water supply be required this would be dependent on renewal of water take consents, which in turn may require upgrades to infrastructure to ensure compliance with drinking water standards. There is a noted issue with one of the springs - high Mn.

There is reportedly sufficient capacity at the existing WWTP for planned residential growth with respect to treatment and disposal to the pumice fields. This is with limitations of taking on more trade waste, highlighting the current limitation that the Putauaki Industrial zone supported by a pumped system. Approximately 2750 properties and few industries are at present sending waste to KDC WWTP. However, it is to be noted that the plant was significantly impacted and capacity for growth reduced by the introduction of the Waiu Dairy waste stream.

Some areas of the plant are operating at 80% capacity and others at 50%. The pumice fields can be expanded if/when required.

There is an option to accept WW from Te Teko, pending growth of the TeTeko town. It is noted that some capacity will be allocated to industrial use and expansion of Putauaki industrial zone, north of Kawerau. In this case, the treatment and disposal system would need an upgrade (subject to Beca assessment), and this option would also require a plan change so that requires consideration in terms of complexity, costs, responsibility.

With respect to stormwater management provisions, it has been reported that there is adequate capacity for increased residential lots within Stoneham Park and the K2 Hardie/Beattie Avenue growth area. In this latter area groundwater issues have been identified therefore any development would need to be cognisant of this redeeming characteristic of the area and plan to address this within the development design.

Any future development is recommended to be supported with a comprehensive stormwater management approach which includes the investigation to surface flow management and groundwater influence. This will ensure that the effects on the sensitive areas (with respect to surface and flood flows) are not exacerbated

No additional costs have been estimated as it is assumed that water and wastewater needs for infill/growth can be accommodated by existing infrastructure with any upgrades funded by renewals budgets.

5 Summary and Recommendations

The following is a summary of key findings noted above, as well as recommended further investigations relating to options and/or comparison of options, particularly relating to the three optional "new towns" Awakeri, Te Teko and Hukutaia.

5.1 Ōpōtiki

5.1.1 Hukutaia

Water

- Addition of a new river crossing at Stoney Creek and other upgrades (boosters, Dip Road – WSP, 2021) will improve water pressures (potable and fire water) in Hukutaia, Ōpōtiki and Waiōtahe
- Recommended further investigations;
    - Optimise water storage and upgrades (and timing) for potable and fire water once Hukutaia development option is further refined.
    - Consider water demand management measures to manage consumptions and losses (this is a general recommendation as well – for extending the life of all water supply assets).

Wastewater

- Plan to install low pressure sewers (minimises I/I and allows flexibility) and upgrade wastewater rising mains and pumpstations enroute to ODC WWTP.
- Alternative is to develop a new WWTP west of Hukutaia to treat WW from there, as well as Waiōtahe, and increase treatment resilience for the broader area – however at a higher cost than above.
- In the short-medium term the intention is to upgrade connectivity and pumping (from Waiōtahe and Hukutaia) to the existing ODC WWTP, which will be upgraded, initially to accommodate growth, predominantly.
- Recommended further investigations;
    - Update cost allocations for infrastructure upgrades – short and longer term, considering development options.
    - Undertake an economic (PV) assessment of treatment and disposal options for wastewater – comparing;
        - Reticulation (pressure sewers as proposed by PDP, 2023) of wastewater to the existing ODC WWTP, coupled with appropriate upgrades to reticulation and pumping as well as the WWTP upgrade to accommodate additional wastewater
        - Implementing a new WWTP at Hukutaia and reticulating all of Hukutaia and potentially Waiōtahe wastewater to the new plant (relieving pressure on the existing WWTP and improving resilience). This option needs to consider availability (and cost) of land suitable for disposal.
    - Impact of industrial growth on the above, in terms of WW management/requirements.

Stormwater

- Development in a staged approach will provide the growth aspirations for this area
- Concept design of the stormwater management to support the Hukutaia growth area has been undertaken
- Green infrastructure has been recommended where topography allows.

- Recommended further investigations:
    - Continue to the preliminary design phase to provide certainty of growth delivery
    - Ensure Hukutaia Growth area assesses and manages effects on downstream drainage systems

5.1.2 Ōpōtiki Infill

It is to be noted that this development option is not included within the highlighted options that required further consideration however the CKL team have included it for completeness.

Water

- Water supply and storage appears adequate for infill options, potentially requiring upgrades which could be catered for in the renewals budget.
- Installation of Stoney Creek River crossing will improve network pressures.
- Recommended further investigations;
    - Coupled with Hukutaia, recommendations (refer above) could include water network optimisation (pending Hukutaia scenario) and upgrade potential to improve water pressures (potable and fire water) in Ōpōtiki and Waiōtahe.

Wastewater

- Upgrades are required for the ODC WWTP, pumpstations and reticulation to cater for growth in Hukutaia and Waiōtahe, including installation of a new river crossing.
- Recommended further investigations;
    - Establishing a new WWTP in Hukutaia and diversion of Hukutaia and Waiōtahe WW away from the existing ODC WWTP (refer Hukutaia section above) to free up capacity and extend life of the existing ODC WWTP assets.
    - Longer term impact of industrial growth (mussel farm, other).

Stormwater

- Key flood resilience projects are underway which include the following:
    - Rural-Urban flood protection with southern limit of Duke Street.
    - Transfer of flood flows from Otara River to Waioeka River flood plain.
    - Duke Street pump station.
    - Tarawa Creek Pumpstation upgrade.
- Undertake a comprehensive SMP to enable development to occur without detrimental effects for the flood schemes or increasing risk due to flood and other hazards.
- Recommended further investigations:
    - BoPRC Rivers model updates to be provided.
    - Flood risk assessment for the existing Ōpōtiki township.
    - Integrated catchment-wide approaches to manage existing and future development.

5.1.3 Waiōtahe

Water

- Adequate water is available from Ōpōtiki supply for infill (building on the 116 reticulated, consented lots). Low water pressure at the reservoir is a limiting factor. However, upgrades to Ōpōtiki and Hukutaia network (WSP, 2021) will improve this situation.
- Need to possibly upgrade the storage and booster station if more significant growth is expected here.
- Recommended further investigations;
    - Improvements to Water supply in Ōpōtiki and Hukutaia and means to optimise water pressures available for potable and fire hydrant water in Waiōtahe (ensuring SNZ PAS4059 requirements are satisfied).
    - In line with the above, requirements for additional storage and/or boosting.
    - Option to bifurcate the supply from Ōpōtiki and provide water to Paerata Ridge developments to supplement the private water supply scheme (including Papakāinga), if this becomes a requirement.

Wastewater

- Capacity in the system for pumping of WW to Ōpōtiki WWTP is sufficient to accommodate projected, limited growth (116 properties on currently serviced, vacant land).
- A future river crossing is proposed to transfer wastewater from Hukutaia and Waiōtahe (PS-05) via a new pumpstation and rising main, located near the Marina, directly to the ODC WWTP.
- Recommended further investigations;
    - A PV comparison for pumping WW to a potential new WWTP west of Hukutaia vs the current arrangement (pumping to ODC WWTP).
    - Refinement of planned changes e.g. new pumpstation at Marina and new dedicated rising main across the river for Waiōtahe/ Hukutaia WW, once there is more certainty about the extent and timing of development in Hukutaia.

Stormwater

- CMP or SMP approach to provide for urban development, which includes upgrading of existing communal devices.
- Coastal retreat is to be considered however has not been assessed as part of this reporting
- Recommended further investigations:
    - Management of flows through development of comprehensive CMP and/or SMP.
    - Coastal inundation and retreat requirements from the Climate and Resilience workstream.

5.2 Kawerau

Water

- Sufficient water is available for infill and expansion e.g. Roy Stoneham Park. However this is dependent on renewal of water take consents, which in turn may require upgrades to infrastructure to ensure compliance with drinking water standards and also additional storage.
- There is an issue with one of the springs (high Mn), but reduction/management of Mn will free up that source for supporting further growth or intensification.
- Recommended further investigations;
    - Options for upgrading of water takes, quality (Mn removal) improvement of spring water, overall supply resilience and feasibility to support growth in Putauaki industrial area (currently only supply potable water) and south of Kawerau (TeTeko), should this assist with supporting additional capacity in that part of the Plains.
    - Assess option to implement water metering to manage high water demand and further extend the life of existing assets.

Wastewater

- Approximately 2750 properties and few industries sending waste to KDC WWTP.
- There is sufficient capacity at the existing WWTP for planned residential growth – with limitations of taking on more trade waste.
- Some areas of the plant are operating at 80% capacity and others at 50%.
- The pumice fields can be expanded if/when required.
- Recommended further investigations;
    - Option to accept WW from TeTeko, pending growth of the TeTeko town. The treatment and disposal system would need an upgrade (subject to Beca assessment), and this option would also require a plan change so that requires consideration in terms of complexity, costs, responsibility.
    - Option to accept additional industrial effluent from Putauaki, pending industrial growth.

Stormwater

- Adequate capacity for increased residential lots within Stoneham Park and the K2 Hardie/Beattie Avenue growth area.
- Groundwater issues have been identified in K2 area, future development to address this feature.
- Future development to be supported with a comprehensive stormwater management approach.

5.3 Whakatāne

5.3.1 Awakeri

Water (refer Appendix 4: WDC Water Supply Strategy, Concept Working Plan – for conceptual layout/ illustration, for clarity)

- In the short to medium term growth (approximately 500 units) can be supported by upgrading storage and also linkage to the Otumahi scheme.
- Future more significant growth here will benefit from linkage to the Otumahi water scheme, particularly the proposed primary water supply main enroute to Whakatāne – a sensible option for Awakeri, considering resilience and future proofing and would avoid requirement for upgrading storage at Awakeri albeit this could be an option for added resilience.
- Recommended further investigation;
    - Practicality and cost of linkage to the Otumahi scheme (direct on-line) and/or retaining existing treatment and storage facilities as a contingency/supplementary source.
    - Options for an interim, dedicated supply main from Paul Road reservoir to Awakeri, if the primary main is delayed – this could potentially be considered as an interim stage, pending decision on Awakeri growth/timing, and implications of this on the Otumahi WTP and water source.

Wastewater

- Should significant growth occur here, Awakeri's current septic tank regime should be upgraded to a full water-borne sewage reticulation system. Treatment of the towns WW could be accommodated as follows;
    - An interim modular package plant and STEP/small bore system to accommodate initial/short term growth (circa 500 houses). This would be followed by additional STEP systems and treatment modules to suit further development. However, for more substantial growth, on-site grinder pumps and small bore reticulation to a new treatment works and land disposal field would be more economical, and has been assumed. Available/suitable land for disposing treated wastewater will need consideration -disposal area is estimated at 69ha (+ 50% reserve area = total of circa 105ha)
    - An alternative consideration would be to reticulate (grinder pumps and small bore pipes) and pump all (or only future growth stages) wastewater to Whakatāne for treatment and discharge to ocean – in which upgrading of the WDC WWTP cost could be pro-rata to accommodate this. This option would however incur higher initial capital costs for the bulk main and less versatility (staging) than the above option.
- Recommended further investigations;
    - Viability and cost to develop a new WWTP to treat Awakeri WW, including assessment of available treatment technologies e.g. SBR, MBR. Key considerations would be availability and cost of land for treated effluent disposal as well as staging options.
    - More detailed assessment of cost to pump Awakeri WW to Whakatāne with possibly Matatā and Edgecumbe included, for treatment and/or ocean discharge
    - Economic (PV) assessment and comparison of the above, considering capital and operating/renewal costs as well as impact on Whakatāne WWTP i.e. adequate capacity and/or upgrades required, also considering Whenua West of Coastlands potential additional contribution as well as changing discharge standards.
    - Economic assessment of low-pressure sewer system compared with conventional gravity– including benefits of lower I/I and reduced WW flows (and hence reduced costs for WWTP).

Stormwater

- Catchment wide approach to stormwater management will provide comprehensive guidance to the support of the residential development in the area whilst honouring objectives of Rangitaiki drainage scheme.
- Integration with robust urban design outcomes which includes green infrastructure for resilient outcomes.
- Located within the Rangitaiki Drainage scheme, development needs to ensure that the objectives of this scheme are not compromised, including levels of service for rural sector.
- Stormwater management options will include quality and quantity devices to protect receiving environments.
- Recommended further investigations:
    - Urban design outcomes to integrate stormwater management.
    - Catchment wide stormwater management plan to guide development to mitigate detrimental effects.

5.3.2 Te Teko

Water

- Adequate water storage should be available with the proposed, upgraded storage capacity (4Ml) to support growth/new town and contribute to additional storage in the Plains as a whole.
- Growth would require upgrades to water reticulation but assume that bulk supply would be provided either locally, from Otumahi (as it currently is) and interlink with Plains (Braemar) supply.

Wastewater

- Significant development would require a new WWTP together with associated disposal fields/area - with similar challenges as noted above for Awakeri i.e. availability of suitable land and associated costs.
- The alternative that could be considered is to pump WW to Kawerau for treatment and disposal there. Capacity exists at Kawerau; however, upgrades would be required. There would also be a need for a Plan Change in this case.
- Recommended further investigation;
    - Investigate feasibility and economics (also land availability – approx. 69 ha +50% reserve area) of treating wastewater and disposing to land in/near TeTeko.
    - Investigate economics of pumping wastewater to Kawerau, considering plan change (implications, costs) and upgrade requirements of this option.

Stormwater

- Catchment wide approach to stormwater management will provide comprehensive guidance to the support of the residential development in the area whilst acknowledging the management of the Rangitaiki drainage scheme.
- Integration with robust urban design outcomes which includes green infrastructure for resilient outcomes.
- Located within the Rangitaiki Drainage scheme, development needs to ensure that the objectives of this scheme are not compromised, including levels of service for rural sector.
- Te Teko is located downstream of Matahina Dam, with hazard assessment acknowledged, however not included within the scope of this report.

- Stormwater management options will include quality and quantity devices, which maybe communal, to protect receiving environments.
- Recommended further investigations;
    - Urban design outcomes to integrate stormwater management.
    - Catchment wide stormwater management plan to guide development to mitigate detrimental effects.

5.3.3 Matata

Water

- The water supply from Jennings is adequate to support growth in the short to medium term and a link to Braemar supply would provide supplementary water as/when required to support longer term growth, especially if the development to the east (1500 lot potential) is realised.
- Recommended further investigation.
    - Additional storage at Matata for extended growth east of town.
    - Extent of either Braemar water supply or Jennings water supply /storage upgrade to support future, more significant growth, should this occur.

Wastewater

- The growth potential of Matata is largely dependent on the ability to treat and dispose wastewater. Staged development has been considered to accommodate uncertainty in rate of development.
- This includes implementation of STEP systems, low pressure reticulation and modular package plant treatment to accommodate initial infill and low growth (260 infill +140 new units) as well as further infill (500 units) and up to 600 units green fields growth to the east of town. Additional treatment and disposal would be required to accommodate the latter.
- Recommended further investigations;
    - Availability of land to assess feasibility of treated effluent disposal for the eastern extension.
    - Explore the option of pumping raw or semi treated wastewater to Edgecumbe for transmission to Whakatāne ponds for treatment and ocean discharge. Should pumping wastewater from Awakeri to Whakatāne be seen to be viable, these two effluent streams could be combined – however, an assessment should be undertaken assessing capacity constraints at the WWTP, given changing discharge standards as well as other competing contributions (Awakeri, Whenua West of Coastlands).
    - The alternative could also be considered i.e. pumping Edgecumbe wastewater to Matata for treatment and disposal there – this would also need to consider financial contributions for the development of this “local regional” treatment works.

Stormwater

- Eastern area is partially within the Rangitaiki drainage scheme and could discharge to the Tarawera River.
    - discharge is to be treated.
    - designed with climate change influences, such as increased tailwater conditions.
- Development in the eastern area of Matata is to have a catchment wide approach to stormwater management which integrates with urban planning to ensure there are multiple uses for greenspaces.

- Infill within the existing Matata township may occur under a catchment wide approach to stormwater management and with the co-governance approach.
    - Te Awa o Te Atua Wildlife Management Reserve, and the Te Awa o Te Atua (Matata Lagoon)
        - Management administered by Tarawera Awa Restoration Strategy group, the Joint Advisory Committee - which includes DOC, Ngāti Tūwharetoa ki Kawerau and Ngāti Awa
        - protection of the Matata Lagoon is paramount to the longevity of this resource.

5.3.4 Whakatāne infill (excl. Kopeopeo)

Water

- There is a need for future proofing the supply source and storage and also adding resilience to water supply.
- Resilience of supply is threatened by having only one bridge crossing into Whakatāne.
- The option for the primary and secondary mains/links with Braemar and Otumahi, lend well to providing for security and resilience.
    - The primary main would offer resilience of supply to (and provide capacity for infill) to Whakatāne and Ohope as well as providing water to Awakeri to support growth there. In the longer term the proposed Eastern Plains reservoir would provide buffer storage.
    - The secondary main would provide options to add resilience to supply for the Plains, Coastlands, Whenua West of Coastlands and also further Papakāinga growth considerations in that western area.
- Recommended further investigations;
    - Timing (and funding) of the primary main, eastern reservoir, Awakeri link needs assessment against bulk water requirements in Awakeri, Plains, Whakatāne.
    - Timing (and funding) of the secondary main.
    - Water demand management to manage demand and maximise use of existing assets – water metering/ tariffs, water loss management.
    - Papakāinga – Coastlands area – further investigate potential and implications.

Wastewater

- Whakatāne WWTP upgrade is planned. Opportunity exists to accept WW from various external sources to facilitate growth options in the Plains and Tāneatua, namely;
    - Awakeri, pending growth/development of new Town.
    - Edgecumbe and Matata.
    - Tāneatua, if treatment options there are prohibitive.
- Benefits of the above include ability to discharge treated WW to the ocean rather than land disposal (availability, cost).
- Recommended further investigations;
    - Assess economics (PV) and consent implications of accepting WW from the towns mentioned above.
    - Coastlands area – investigate development potential and broader implications for wastewater reticulation and treatment.
    - Continue discussions regarding Whenua West of Coastlands potential (1730 lots) development and broader implications for bulk transfer to and treatment at WDC WWTP.

Stormwater

- Whakatāne township currently has river protection works underway, including investigation into groundwater interaction.
- Pumpstation upgrades are adding an increased level of service and resilience to the stormwater management system.
- Recommended further investigations/inputs:
    - development to consider the river protection projects currently underway.
    - consideration of the Whakatāne -Tauranga River catchment responses.

5.3.5 Kopeopeo Infill

Water supply

- Most of the reticulation comprises 100DN PVC and 50DN PVC rider mains. Pending development/ infill/ densification of Kopeopeo, reticulation may require upgrading to cope with additional demand.
- Trunk mains along Domain Road, then down King, James and Stewart Roads comprise 200DN AC (asbestos cement) pipes. Pending condition, these AC lines may presumably be nearing end of life. Pending development/infill/densification of Kopeopeo, these mains could be upgraded to larger bore PE or PVC.
- Recommended further investigations;
    - Assessment of infill potential, type, extent and estimated water demands.
    - Assessment of older pipes and pumps, confirmation of any upgrades required.

Wastewater reticulation

- Most of the infrastructure comprises 150DN to 225DN PVC and AC reticulation feeding to a pumpstation and 300DN rising main to the nearby treatment ponds.
- Understandings of capacities and condition of pumps and rising main are currently being developed. This work needs to continue to refine system performance and development.
- However, the latter should be capable of conveying approximately 200l/s (equivalent of approximately 5000 residential units). Further assessment is required to confirm conveyance and treatment capacities and potential upgrades.
- Recommended further investigations;
    - Assessment of infill potential, type, extent and estimated wastewater flows.
    - Assessment of older pipes and pumps, confirmation of any upgrades required to reticulation, pumping and. Potentially WWTP.

Stormwater

Kopeopeo infill area is at a slightly higher elevation than the Whakatāne CBD area, with the stormwater network including a pumped discharge to the Whakatāne River.

Recommended further investigations/inputs:

- development to consider the river protection projects currently underway.
- consideration of the Whakatāne -Tauranga River catchment responses.

5.3.6 Thornton Dunes

- Growth in this area will require upgrading of water supply and storage infrastructure.
- Wastewater treatment and disposal could be accommodated by additional septic tanks.
- Should growth be more substantial, a package WWTP and land disposal would need consideration.

- Stormwater management would benefit from catchment wide guidance through a comprehensive stormwater management plan, with landowners undertaking the stormwater management provisions.
- Further investigation/consideration;
    - Extent of additional permanent and seasonal fluctuations of population.
    - Threshold where improvements are viable and sustainable (capex and opex).

5.3.7 Whenua West of Coastlands

- Whenua West of Coastlands has space for developing approximately 1730 lots (WDC estimate). These would be serviced with bulk water from the existing Whakatāne reticulation in the short term. In the longer term pending the development of the secondary water main from Braemar, this could be an alternative source, free up capacity in the Whakatāne network.
- Wastewater could be reticulated to the existing Whakatāne wastewater treatment plant (ponds) which is believed to have adequate capacity.
- Development would benefit from a stormwater management plan which integrates with urban planning to ensure there are multiple uses for greenspaces.
- Stormwater runoff is to utilise discharge ground through communal and at source systems, with provision for secondary flow within the urban form that discharges to the remnant stream bed that ultimately contributes to the Orini Canal.
- Development of a comprehensive SMP would guide this area to deliver a resilient and sustainable urban outcome.
- Recommended further investigation;
    - Extent of development and timing considerations – future proof potential connection to potential secondary water main.

5.4 General considerations – moving forward

As a general conclusion to these investigations, the following aspects warrant further consideration that could benefit the working group's options reporting going forward:

- Refinement of timing of developments (ST/MT/LT) – updating of CKL assumptions, and funding allocations.
- Consideration of catchment wide approach to stormwater management which integrates with:
    - Outcomes of the other Spatial Plan workstreams, such as the Hazard risk associated with flood and climate change.
    - Flood modelling being prepared by the Regional Council for various river catchments
    - Objectives and expected outcomes of the various drainage schemes within the Eastern Bay of Plan catchments.
- Funding of developments
    - Split between council funding and development funding/ development contributions, considering, for example, advantages of low-pressure sewerage and potential to split costs between developer, council, homeowner.
- Local water done well
    - With respect to the governments "Local Water Done Well" roll out further funding mechanisms will need to be investigated. This will influence the magnitude of growth and timing for the options considered within this report.
- New national wastewater quality standards

- Implications to existing and proposed treatment and disposal – lower standards could free up capacity in existing treatment plants whilst more onerous standards could require more costly treatment and disposal upgrades.

- Whakatāne treated wastewater disposal options - explore golf course irrigation possibilities for the Whakatāne WWTP disposal resilience and ROI.
- Optimised use of existing assets
  - For example, water demand management initiatives including water usage/loss monitoring, demand management could extend the life of existing assets and/or improve levels of service and similarly, reduction of I/I in wastewater networks.

6 Limitations

This report has been prepared solely for the benefit of our client with respect to the particular brief and it may not be relied upon in other contexts for any other purpose without the express approval by CKL. Neither CKL nor any employee or sub-consultant accepts any responsibility with respect to its use, either in full or in part, by any other person or entity. This disclaimer shall apply notwithstanding that the memo/report may be made available to other persons including Council for an application for consent, approval or to fulfil a legal requirement.

Appendix 1 Supporting Assumptions and Cost Estimates

Assumed infrastructure rates for project estimates - August 2024 CKL Report (updated July 2025 incl. escalation where required as well as contingencies/fees and WDC changes to staging - Matata, Awakeri)									
	Notes	Costs are based on assumed rates from various sources (CKL references, WDC rates from recent projects)							
		Escalation of 3% p.a. has been applied where required							
		Colour coding has been applied to assist with navigation - blue = water supply, brown = wastewater, green = stormwater							
W, WW, SW	**Option/ Criteria**	**Cost requirements/ description**	**No.**	**Unit**	**Rate/unit**	**Cost estimate**	**Source of info/ cost est**	**Timing ST - 2026 MT 2033 LT 2053**	**Comments/ assumptions**
W	**Table 1 – Water options assessment and estimated costs**								
	Opotiki District								
	O1 Hukutaia	New houses - water reticulation - stage 1	446	houses	sum	$2,294,727	Infrastructure Required. Cashflow, 2021 - IAF application	ST/MT	No. Houses from Devt Options Report (2024), p5
		New houses - water reticulation - future	1592	houses	5200	$8,278,400	CKL est - pro-rata above	LT pending Hukutaia growth and resilience	No. Houses from Devt Options Report (2024). CKL rate used
		Add booster pumpstation at Stoney creek and river crossing	1	No.	$2,580,000	$2,580,000	ODC discussion, April/May 25	ST/MT	Added resilience, decommission old Crooked Rd reservoir and push-pull AC main. Refer ODC - 2021-2051 Infrastructure Strategy. ODC imply - water supply ok. Options include a new booster and rising main OR allow new line to new reservoir near Hukutaia existing storage approx.4.5Ml - for 2.1Ml/d (4500 pop) ave. demand (refer below)
		Rising main	1	No.	$1,529,818	$1,529,818	WSP, 2022 and 2021 infrastructure strategy 4.4.1 and 5.1	ST - refer Infrastructure strategy 2021-50	Added resilience
	O2 Waiōtahe / The Drifts	Allow for additional 116 houses (consented)						ST/MT	Limited growth potential for Waiotahe eastern area due to flooding. Limit to 116 consented properties (refer Development Options Report 11.3.1) - confirmed reticulation I already to serve these
		Allow for additional boosting and storage from Opotiki (WSP, 2021) or Hukutaia if Stoney creek crossing added, upgrade existing booster station and tank, NRV at current river crossing.	1	Sum				MT/LT	Assume water supply is adequate to cater for growth but need additional boosting and storage in future - further research needed - refer WSP 2021 - Water pressures are low upstream of reservoir and upgrades needed in Hukutaia (booster) or Opotiki to ensure adequate pressure and adequate fire flow
	O3 Tablelands	Nil							No additional infrastructure envisaged at this stage

	O4 Paerata Ridge Urban and rural	Private water supply, no allowance made							ODC confirmed no further development is expected. Currently a private water scheme run from private bores - probably suffice. If this changes, would need a link from Waiotahe + booster p.stn and more storage.
	O5 Ōpōtiki town	Assume can tap in to existing network, minor upgrades							"Orange" rating so don't consider further. Assume LTP funding natural occurrence? May need pressure boosting for fire requirements -
	O6 Ōhiwa	Nil							"Orange" rating so don't consider further.
	Whakatāne District								
	W1 Awakeri								
		Stage 1 (<500 houses) - link from Otumahi line/scheme to Awakeri res (200DN) and upgrade reservoir - allow	3000	m	540.8	$2,000,000	CKL est	ST/MT	Assume link to existing reservoir from Otumahi scheme - sufficient storage and pressure head for short term growth. Allow some upgrades to existing reservoir to support short term growth
		Reticulation - 500 lots	500	houses	$5,200	$2,600,000	CKL est	ST/MT	Water reticulation estimate only
		Stage 2 - Upgrade Otumahi WTP - Awakeri portion - stage 2 growth	1	Sum	$5,412,000	$5,412,000	CKL est.	MT/LT	WDC feedback, May 25 - prorata $13.2m upgrade between Whakatane and Awakeri - Awakeri portion 41% of $13.2m
		Stage 2 - future growth - Pipeline Otumahi - Awakeri (630 DIA) - pro-rata 630DIA cost	1	Sum	$13,063,468	$13,063,468	CKL est.	MT/LT	Cost to Whakatane is $29m therefore prorata this 41% of total (3300 connections Awakeri vs 8000 Whakatane/Ohope), add contingencies and escalation - refer Awakeri costing
		Stage 2 - future growth - Awakeri new bulk connections to Primary main	2	No.	$50,000	$100,000	CKL est	MT/LT	Tee-off and PRV's Pending installation of primary main
		Stage 2 - future growth - Allow bulk reticulation to Awakeri developments from bulk connection	2000	m	$541	$1,081,600	CKL est	MT/LT	CKL estimate 2km 200 main - unknown length, merely an estimate
		Awakeri - reticulation longer term - 2800 lots	2800	houses	$5,200	$14,560,000	CKL est	MT/LT	Water reticulation estimate only
		Awakeri reservoir decommissioning				$578,813	McKenzie (Water supply strategy, 2022)	ST/MT	Decommissioning Awakeri reservoir - when the feed from the primary main comes on line from new Otumahi reservoir. Note alternative to refurb and keep to add resilience
		Alt - upgrade storage at Awakeri - Allow	1	sum	$1,000,000	$1,000,000	CKL est	MT/LT	Rather connect to Primary main
	W4 Tāneatua	Reticulation	200	houses	$5,200	$1,040,000	CKL est	ST (to 2026)	Not a short-listed option (flood threat). Devt. options report, Table 2 - assume additional water covered by renewals.
		Upgrade infrastructure?							Unsure of capacity and upgrade requirements - not in AMP

	W3 Matatā greenfields	Stage 1 - Reticulation for 140 additional houses and 260 infill = 400. Allow new retic for only new houses.	140	houses	$5,200	$728,000	Devt Options report and CKL Est	MT	Assume number from Devt Options Report (400 total but new retic only for new houses - existing retic serves infill).
		Stage 1 - Upgrade storage at Matata to cater for growth	80	kl	$2,600	$208,208	CKL est	ST	Confirm capacity existing and need for upgrade
		Stage 2 - Reticulation for 500 houses - available infill - reticulation	500	houses	$5,200	$2,600,000	CKL est	ST/MT	New or upgraded infrastructure - possibly reduce this estimate (as per stage 1) since some infrastructure already there (infill) - once split better known
		Stage 2 - upgrade storage for 500 houses	286	kl	$1,300	$371,800	CKL est	MT	430m3 existing storage c.f. 330m3 peak demand i.e. capacity for growth. However, further expansion east would require additional storage - allow
		Stage 2 -link to Braemar via link to existing main from Jennings- 4km 200ID (250OD PE) pipeline	4000	m	$541	$2,163,200	CKL est	MT/LT	Estimate 4km 200 DN to tie into back of Jennings supply - Only if necessary - not currently being considered
		Stage 3 - Reticulation for 600 houses (long term) to the east	600	houses	$5,200	$3,120,000	CKL est	MT/LT	Greenfields reticulation
		Stage 3 - cater for growth to east (600 houses 5 yrs) - treatment						MT/LT	Assume Jenning adequate - no upgrade allowed for here
		Stage 3 - cater for growth to east (600 houses) - upgrade storage	343	kl	$1,176	$403,669	CKL est	MT/LT	As above for stage 2
	W2 Te Teko	Reticulation for 3300	3300	houses	$5,200	$17,160,000	CKL est	MT/LT	Alternative development to Awakeri - assume same number of units
		Upgrade reservoir to 4Ml	**1**	sum	$4,371	$4,371	WDC conceptual costing (McKenzie)	MT	Linked to Otumahi scheme for supply - assume adequate pipe link/size - need for this reservoir questionable
		Link WTP to reservoir	**1**	sum	$3,059,636	$3,059,636	WDC conceptual costing (McKenzie)	ST/MT	
		Bore upgrade	**1**	sum	$546,364	$546,364	WDC conceptual costing (McKenzie)	ST/MT	Refer to McKenzie report - either upgrade bore and storage and WTP OR link to Paul rd.
		Upgraded the link to Otumahi system - 7 km 200ID (250ODPE) pipe	7000	m	$541	$3,785,600	CKL est	MT	Assume upgrade required to existing 100DN pipe
	W5 Minginui	Aspire to 50 houses	50	houses	$5,200	$260,000	Devt options report 16.1, est	ST/MT	
	W6 Murupara	Aspire to 300 houses	300		$5,200	$1,560,000	Devt options report 16.1	MT	Devt options report - assume additional 300 - W covered by renewals
	W7 Whakatāne town, excluding Kopeopeo	Otumahi Reservoir (4Ml - current)	1	Sum	$4,000,000	$4,000,000	WDC - actual	ST	Current, built
		Upgrade Otumahi WTP	1	Sum	$7,788,000	$7,788,000	CKL est.	MT	WDC feedback, May 25 - prorata $13.2m upgrade - split pro-rata between Whakatane and Awakeri
		Primary main - Otumahi to Whakatane (20km)	1	Sum	$18,798,649	$18,798,649	WDC conceptual costing (McKenzie)	MT/LT	Cost to Whakatane is $29m therefore prorata this 69% of total (3300 connections vs 8000 Whakatane/Ohope)...OR assume 8km of 200ID dedicated main
		Secondary trunk main from Braemar to Coastlands	1	Sum	$24,145,005	$24,145,005	WDC conceptual costing (McKenzie)	LT	All incl. - incl. bridge crossing
		Alternative bulk supply from secondary main	1	sum	$4,098,819	$4,098,819	WDC conceptual costing (McKenzie) - Coastlands	MT	Assume Warrens Coastlands loop costing

	W7 Whakatāne town, excluding Kopeopeo	Boosters on primary main	1	Sum	$1,092,727	$1,092,727	McKenzie Presentation	MT/LT	2 x shown on McKenzie presentation, assume one on primary main
		Booster pumpstation (Valley Road)	1	Sum	$1,639,091	$1,639,091	WDC conceptual costing (McKenzie)	MT/LT	May also not be required primary/secondary main built
		Pipe from E. Plains Reservoir	1	Sum	$3,343,745	$3,343,745	WDC conceptual costing (McKenzie)	LT	
		Eastern reservoir 10 Ml	1	Sum	$6,556,362	$6,556,362	WDC conceptual costing (McKenzie)	LT	NOTE - Costs excl. Valley rd. Braemar reservoirs refurb/renewal excluded
		Decom Whakatane WTP	1	Sum	$1,639,091	$1,639,091	WDC conceptual costing (McKenzie)	LT	
		Other - valves, bulk connections	1	Sum	$546,364	$546,364	WDC conceptual costing (McKenzie)	LT	
	W8 Kopeopeo	Unknown development and hence consumptions							Confirm development and consumptions, impact on infrastructure
	W10 Ohope Beach	Ohope W linkage with Whakatane?							Uncertainty re coastal inundation
	W9 Matatā infill	140 - assume infill (on top of 260 existing) - tot 400	140	No.	$5,200	$728,000	Devt options report 16.1	ST	Pending WWTP upgrade to accommodate 400 units - see W3 above
	W11 Thornton dunes	Upgrade existing 50DN pipe to (assumed) 100 DIA (or 150DN)	2000	m	$234	$468,000	CKL est	MT/LT	Leave as is (rural lifestyle) - only upgrade if demand warrants - could draw water from secondary main/Plains scheme
		Provide storage / boosting for FH's	100	m3	$2,600	$260,000	CKL est	MT/LT	Estimate only
	Whenua West of Coastlands	Development for approx. 1730 lots - **bulk reticulation** to serve this	1	sum	$4,682,500	$4,682,500	WDC est - NASH	MT/LT	Bul reticulation - ref NASH report from WDC
		Development reticulation estimate	1730	houses	$5,200	$8,996,000	CKL Est	MT/LT	
	W12 Manawahe	As-is							
	W13 Ōhiwa Harbour	As-is							
	Kawerau District								
	K1 Roy Stoneham Park	Development of 82 houses planned	104	houses	$5,200	$540,800	Devt Options Report 15.1, CKL Est	ST/MT	General - ave. demand 4100m3/d, storage = 11250m3. However, low pressures during peak summer demand will necessitate pipeline upgrades in future. Water source and volume of storage acceptable – sufficient contingency supply, high consumption could be tempered with rates/metering if required
	K2 Hardie/Beattie Ave area	?							
	K3 Valley Road	?							
	K4 Kawerau town	?							

	K5 Western rural area	?							
WW	**Table 2 – Wastewater options assessment and estimated costs**								
	Option/ Criteria	Cost requirements/ description	No.	Unit	Rate/unit	Cost estimate	Source of info/ cost est	Timing ST - 2026 MT 2033 LT 2053	Comments/ assumptions
	Opotiki District								
	O1 Hukutaia (to existing WWTP	Stage 1 pressure sewer system - 446 (prev. 427) new units - PDP 2023 (Early devt), appendix - extracted costs per PDP guidance	446	Houses		$3,500,000	PDP appendix to early devt. And discussion PDP	ST/MT	In LTP - 25% Council, 75% DC.
		Stage 1A - infill and existing conversion - Pressure sewer system -- 1187-446 units	741			$5,093,912	PDP appendix to early devt. And discussion PDP and ODC May 25	MT	Balance of Stage 1 units up to 1187 - not in LTP
		Stage 2 - Pressure sewer system - PDP 2022 option 2 stage 1 Balance of lots, future	1592	Houses		$8,200	PDP appendix to early devt. And discussion PDP	LT	Refer PDP report, 2022, Table 7 - total $26.85m escalated - above. Assume 25%/75% split Council/DC. Reduced from $19k, changed ref to $7,480k (Table 7 PDP) and escalated
		Opotiki WWTP and disposal field upgrade	1	sum		$16,300,000	Infrastructure requirements cash flow	MT	Updated based on ODC discussion/comment
		Developer portion all a stages	1	sum		$65,083,559	PDP report 2022/2023, Table 7	ST/MT/LT	Assume this relates to grinder pump, boundary kit installation, small bore reticulation - use PDP figures - pro-rata stages 1, 1A, 2 - $10,445k, $17,354k, $37,284k
	O1 Hukutaia (to new WWTP)	Stage 1 pressure sewer system - 446 (prev. 427) new units - PDP 2023 (Early devt), appendix - extracted costs per PDP guidance	446	sum		$3,500,000	PDP report, 2023, Table 7	MT	NOTE - In this instance, Marina P.stn and upgrades to get WW to existing ODC plant can be excluded (pump to new WWTP) - however, pro-rata cost split unknown so assume similar to above since location of new WWTP not known. - may need review
		Stage 1A - infill and existing conversion - Pressure sewer system -- 1187-446 units	741			$5,093,912	PDP appendix to early devt. And discussion PDP and ODC May 25	MT	Balance of Stage 1 units up to 1187 - not in LTP
		Stage 2 - Pressure sewer system - PDP 2022 option 2 stage 1 Balance of lots, future	1592	sum		$8,200	PDP report, 2023, Table 7	MT/LT	Refer PDP report, 2022, Table 18 (same as 2023 report table 7) - pro-rata stage 1 for option 3. Note 2023 report differs - confirm
		New WWTP plant near Hukutaia - treatment - cater for Hukutaia and Waiotahi (Paerata?) - locate to N or S. Assume caters for Hukutaia new and Waiōtahe	1817	m3	$14,100	$25,613,807	CKL est guided by above figs + Waiotahi figure PDP 2022 Table 19	LT	Confirmed with ODC - PDP report identified a further option of new WWTP (for added resilience) to potentially accommodate Hukutaia, Waiotahi. Discussed with PDP - assume peak factor 1.2 for WWTP, 300 houses Waiotahi and round up by 30% x $10k/m3
		New WWTP plant near Hukutaia - **land disposal cost** - incl. Waiotahe		sum		$6,851,215	CKL estimate guided by PDP Matata numbers as well as Ormistons feedback as a guide	LT	Excludes land acquisition - revised Feb 25 using Ormistons estimates

O2 Waiōtahe / The Drifts	Pump station and/or storage upgrade (pump to ODC WWTP)					CKL est		Exclude - assume existing adequately sized for whole development
	Pump station and rising main to potential Hukutaia WWTP	12000	m	$541	$6,489,600	CKL est	LT	Estimate 12km of 200 dia rising main to WWTP - use existing P. Stn
	Assume existing retic ok for whole development incl. 116 consented lots							Already reticulated - confirmed by ODC
	Upgrade contribution for ODC WWTP?							Assume already accounted for in WW transfer and treatment
O3 Tablelands	Nil							
O4 Paerata Ridge Urban and rural	Assume no development and continue as-is							Red rating so don't consider further - assume infill on current basis for W and WW services - private
O5 Ōpōtiki town	Infill costs as occur – WW could use pressure sewers to minimise I/I, but capacity of WWTP would need upgrade, pending volume of infill/uptake/limitations	50						Orange rating so don't consider further. Assume LTP funding natural occurrence? Confirm Nathan.
O6 Ōhiwa	Nil							Orange rating so don't consider further. Assume LTP funding natural occurrence? Confirm Nathan.
Whakatāne District								
W1 Awakeri 3300 units	Stage 1 - STEP, low pressure retic. and develop new WWTP at Awakeri - ST/MT - 500 houses - Innoflow or similar modular plant	500	houses	$58,500	$29,250,000	Discussion WDC, May 2024	ST/MT	Initial stage to enable development - modular easier to stage in. Rate is all inclusive - STEP, small bore retic., treatment and disposal
	Stage 2 - Option 1 - future development - 2800 units - grinders, reticulate (small bore), conventional WWTP and land disposal, staged						MT/LT	
	Stage 2 - Option 1 - Grinders on site (developer/build)	2800	Houses	$15,000	$42,500,000	CKL est	MT/LT	Reduced $22k on-lot cost since greenfield
	Stage 2 - Option 1 - Reticulation (small bore) for new houses in Awakeri	2800	Houses	$13,000	$36,900,000	CKL est	MT/LT	Assumed low pressure system - retic cost is an estimate
	Stage 2 - Option 1 - develop new WWTP at Awakeri LT - 2800 houses - conventional large plant	1747	m3/d	$14,100	$24,635,141	CKL est	MT/LT	New WWTP for Awakeri new town 2800 only - excl. current Awakeri, Fonterra and Edgecumbe
	Stage 2 - Option 1 - land disposal - for. Above (58 ha)	ha	58	$110,455	$6,406,400	CKL Est	MT/LT	Ormistons guidance - 3mm/d, $11/m2
	Stage 2 - Option 2 - reticulate all stage 2 effluent to pumpstation and pump to Whakatane (retain stage 1 infrastructure)						MT/LT	
	Stage 2 - option 2 - Grinders	2800	No	$15,000	$42,000,000	Discussion WDC, May 2025	MT/LT	Assume 90% full STEP cost by Innoflow since greenfields

	W1 Awakeri 3300 units	Stage 2 - option 2 -retic	2800	houses	$9,750	$27,300,000	CKL est.	MT/LT	Assumed 1.2 Innoflow $15k/lot
		Stage 2 - option 2 - pumpstation	1	no	$2,600,000	$2,600,000	CKL est	MT/LT	est
		Stage 2 - option 2 - rising main to Whakatane	9000	m	$1,040	$9,360,000	CKL est	MT/LT	3301 + current say = 5000 units (future proof) x2.6x200l/p/d = 2,500,000 l/d x PF 5/(3600*24) = 140l/s. 350ID (400OD) PE pipe
		Stage 2 - option 2 - upgrade Whakatane WWTP	1	sum	$4,100,000	$4,100,000	CKL est, guidance from WDC	MT/LT	WDC - allowed $10m for Whakatane upgrade - apportion 41% to Awakeri (3300/8000 connections) - OR Est $10k/m3 - assume portion/contribution (**1/2 est. rate/m3**) only for Awakeri new town effluent - assess/review marginal cost -once new discharge standards announced and impact understood. Similar outcome
		Optional - pump WW from Edgecombe (pre-treated?) to Awakeri? Add $1000k for pumpstation New pipe 8km x 250 OD (say) plus pump stn (assume 80kW)	8000	m	$541	$5,326,400	CKL est	MT/LT	**Exclude here** - future consideration only - for on-pumping on to Whakatane for treatment and disposal. Includes pipeline and pumpstation
	W4 Tāneatua	Aspire to 200 houses	200	houses	$ 8,000	$1,900,000	Devt options report	ST (to 2026)	Devt options report - assume additional 200 - W covered by renewals
		Upgrade WWTP (pond)	104	m3	$ 13,650	$1,719,600	CKL est.		Assume new works rate to extend (high)
	Matata	Stage 1 - 140 new houses - STEP tanks (on-site)	140	No	$28,600	$4,004,000	Discussion WDC, May 2025	ST/MT	Assume full STEP and treatment cost by Innoflow since Brownfields
		Stage 1 - 140 new houses -small bore reticulation (developer)	140	houses	$13,000	$1,820,000	CKL est.	ST/MT	
		Stage 1 - 140 new houses (+ 260 infill) - bulk pipe to treatment plant (council) (for stage 1 and 2)	1	sum	$1,000,000	$1,000,000	CKL est.	ST/MT	
		Stage 1 - 400 units - Innoflow WWTP and land disposal	400	houses	$9,750	$3,900,000	CKL est.	ST/MT	

	Matata	Stage 2 - 500 units infill available sections, sub-divisions - STEP tanks (on-site)	500	No	$28,600	$14,300,000	Discussion WDC, May 2025	MT/LT	Assume full STEP and treatment cost by Innoflow since Brownfields
		Stage 2 - 500 units infill available sections, sub-divisions - small bore reticulation (developer)	500	houses	$13,000	$6,500,000	CKL est.	MT/LT	
		Stage 2 - 500 units - bulk pipe to treatment plant (council)						MT/LT	Assume stage 1 bulk line caters for this
		Stage 2 - 500 units - Innoflow WWTP and land disposal	500	houses	$9,750	$4,875,000	CKL est.	MT/LT	
		Stage 3 - 600 units greenfield - STEP tanks (on-site)	600	No	$25,740	$15,444,000	Discussion WDC, May 2025	LT	Assume 90% full STEP cost by Innoflow since greenfields
		Stage3 - 600 units -small bore reticulation (developer)	600	houses	$13,000	$7,800,000	CKL est.	LT	
		Stage 3 - 600 units - bulk pipe to treatment plant (council)	600	houses	$1,000,000	$1,000,000	CKL est.	LT	New pipe since WWTP assumed to the west of town
		Stage 3 - 600 units - Innoflow WWTP and land disposal- west of town	600	houses	$9,750	$5,850,000	CKL est.	LT	
		Alternative - pump all WW to Whakatane - 25km x 250OD rising main + p.stn	25000	m	$541	$15,020,000	CKL est.	MT/LT	Allowed $1500,000 for p.stn & storage + rising main to Whakatane (confirm viable?) - rates may need adjustment - road reserve etc? and add (initial) dilution for septicity
		-	-	-	-	-	-	-	-
	W2 Te Teko - 3300 units	Reticulation for new houses	3300	houses	$10,400	$34,820,000	CKL est	MT/LT	3300 units, assumed devt rate fir WW retic (could consider grinders and split $ - recommend NPV similar to Hukutaia
		Option 1 - develop new WWTP at TeTeko - for new town only	2059	m3	$14,386	$29,622,744	Discussion WDC, May 2025	MT/LT	Note - similar split to Awakeri can be assumed - short term STEP and modular, longer term larger plant
		Option 1 - new WWTP at TeTeko - land disposal cost	1	sum	$7,550,400	$7,550,400		MT/LT	Incl. in above
		Pump to Kawerau - 12km 200ID + pumpstation	12000	m	$541	$9,089,600	CKL est	MT/LT	Assume 200DN pipe + pumpstation

	W5 Minginui	Aspirations 50 houses	50	houses	$8,000	$400,000	Future devt options, est	ST	
	W6 Murupara	Aspire to 300 houses	300	houses	$8,000	$2,400,000	Devt options rep0rt - 200		Devt options report - assume additional 200 - W covered by renewals
	W7 Whakatāne town, excluding Kopeopeo	Expand WWTP to accept Awakeri, Matata, Edgecumbe/Fonterra - covered above							Included in Awakeri numbers
		Expand WWTP to accept growth in Whakatane	1	sum	$5,900,000	$5,900,000			Assume pro-rata $10m x 59% 8000 conns vs 3300 Awakeri
	W8 Kopeopeo								Qualitative comments only (report) - Uncertain of development and implications on infrastructure - TBC with WDC
	W10 Ohope Beach	Uncertainty of infill - coastal inundation							
	W9 Matatā infill	Assum number of infill - 140						ST/MT	Refer above
	W11 Thornton dunes	Standalone – assume septic tanks							Possible upgrade?
		Alt reticulation (125OD)	3000	m	234	$702,000	CKL Est	MT/LT	Unlikely but assume possible
		Alt. New package plant	1	sum		$630,000	CKL Est	MT/LT	Unlikely but assume possible - treatment and land disposal - based on 300 people permanent, same again holiday
	Whenua West of Coastlands	Bulk reticulation	1	sum	$8,835,450	$8,835,450	WDC est - NASH	MT/LT	Bulk reticulation - ref NASH report from Leilani
		Development - wastewater reticulation	1730	houses	$10,400	$17,992,000	CKL Est	MT/LT	Reticulation - ref NASH report from Leilani. Assume WWTP can accommodate - included'. In portion of $10m upgrade - ref Whakatane above
	W12 Manawahe	As-is							
	W13 Ōhiwa Harbour	As-is							
	Kawerau District								
	K1 Roy Stoneham Park	WW treatment and disposal – sufficient capacity and contingency							Assume current bulk infrastructure can cope with expansion
	K2 Hardie/Beattie Ave area	As above							Assume current bulk infrastructure can cope with expansion
	K3 Valley Road	As above							Assume current bulk infrastructure can cope with expansion
	K4 Kawerau town	As above							Assume current bulk infrastructure can cope with expansion

	K5 Western rural area								Assume current bulk infrastructure can cope with expansion
SW	**Table 3 – Stormwater Options Assessment and estimated costs**								
	Option/ Criteria	Cost requirements/ description	No.	Unit	Rate/unit	Cost estimate	Source of info/ cost est	Timing ST - 2026 MT 2033 LT 2053	Comments/ assumptions
	Opotiki District								
	O1 Hukutaia Stage 1	Extending or new wetland and reticulation to support new lots	446	lots	**$ 25,038.42**	**$11,167,135**	PDP: Civil construction cost estimate (pg105/110)	ST/MT	
	O1 Hukutaia Stage 2	Extending or new wetland and reticulation to support new lots	1592	lots	**$ 32,727.27**	**$ 52,101,818.18**	PDP: Civil construction cost estimate (pg105/110)	LT	
	O2 Waiōtahe / The Drifts	Extending existing communal device	116	lots	**$ 2,400.00**	**$ 278,400.00**	PDP: Civil construction cost estimate (pg105/110)	MT	soakage device (only) is similar in cost to wetland establishment
	O4 Paerata Ridge	This has not been short-listed in the Future Development Options report							
	O5 Ōpōtiki town	This has not been short-listed in the Future Development Options report							
	O4 Paerata Ridge	This has not been short-listed in the Future Development Options report							
	O3 Tablelands	This has not been short-listed in the Future Development Options report							
	O6 Ōhiwa	This has not been short-listed in the Future Development Options report							
	Whakatāne District								
	W1 Awakeri	**New houses**	**500**	**Houses**	**$ 2,400.00**	**$ 12,519,210**	PDP (Hukutaia August 2022 report)	**ST/MT**	total cost of centralised treatment and attenuation plus conveyance
	W1 Awakeri	**New houses**	**2800**	**Houses**	**$ 25,038.42**	**$ 70,107,574**	PDP (Hukutaia August 2022 report)	**MT/LT**	total cost of centralised treatment and attenuation plus conveyance
	W4 Tāneatua	This has not been short-listed in the Future Development Options report							
	W3 Matatā	**Infill within the Township**	**640**	**Houses**	**$ 11,319**	**$7,244,294.18**	PDP (Hukutaia August 2022 report)	**ST/MT**	Allowance for expansion of existing system with allowance at 50% of the greenfields costs for reticulation as not all the system would require upgrading
	W3 Matatā	**Development to the east of the township**	**600**	**Houses**	**$ 25,038**	**$15,023,052**	PDP (Hukutaia August 2022 report)	**LT**	Total costs for stormwater servicing including council and developer led costs

	W2 Te Teko	**Total costs for stormwater servicing including council and developer led costs**	**3300**	**Houses**	**$ 25,038**	**$82,626,784**	PDP (Hukutaia August 2022 report)	**MT/LT**	Total costs for stormwater servicing including council and developer led costs
	W5 Minginui	This has not been short-listed in the Future Development Options report							
	W6 Murupara	This has not been short-listed in the Future Development Options report							
	W7 Whakatāne town, excluding Kopeopeo	This has not included costings for this infill option							
	W8 Kopeopeo	This has not been short-listed in the Future Development Options report							
	W10 Ohope Beach	This has not been short-listed in the Future Development Options report							
	W9 Matatā	**Infill within the Township**	**640**	**Houses**	**$ 11,319.21**	**$ 7,244,294.18**	PDP (Hukutaia August 2022 report)		Allowance for expansion of existing system with allowance at 50% of the greenfields costs for reticulation as not all the system would require upgrading
	W11 Thornton dunes	This has not included costings for this option							
	Whenua West of Coastlands		**1730**	**lots**	**$ 4,152.00**	**$ 4,152,000.00**	0	**MT/LT**	soakage device (only) is similar in cost to wetland establishment
	Whenua West of Coastlands		**1730**	**lots**		**$43,316,465**		**MT?LT**	Total costs for stormwater servicing including council and developer led costs
	W12 Manawahe	This has not been short-listed in the Future Development Options report							
	W13 Ōhiwa Harbour	This has not been short-listed in the Future Development Options report							
	Kawerau District								
	K1 Roy Stoneham Park	This has not included costings for this option							
	K2 Hardie/Beattie Ave area	This has not included costings for this option							
	K3 Valley Road	This has not included costings for this option							
	K4 Kawerau town	This has not included costings for this option							
	K5 Western rural area	This has not included costings for this option							

Appendix 2 Review of Options Ratings and Comments

Appendix 2

Review of Options Ratings and Comments

The working group have updated their ratings, refer to Section 15 draft options report (May 2024), referred to as DOR, which provides direction to the short listed options that will be assessed further in this report. These short-listed (preferred by the working group) options are considered, namely;

- suitable for further investigation (or already in development)

- suitable for further investigation, subject to conditions

The following is a review of the options, including the working group comments.

Table 1 – Commentary on development options draft report ratings

	Option area	Type	Rating – ref section 14	Comments (EBoP Spatial Plan working group) - ref section 15 DOR	Further Comments CKL (incorporating working group review) - February '25
	Ōpōtiki District				
O1 Hukutaia up to 2000 new units		Greenfield	Good	• W - Adequate water for low growth. Constraint is resilience (low storage volume and security of river crossing to Hukutaia). Upgrades would support growth and also benefit Ōpōtiki township between the rivers (resilience plus managed retreat). • WW - Pressure sewer system is being considered ideal for undulating terrain, managing uncertainty around speed and location of development (can be staged) and small diameter mains can be installed within council owned road reserve at a smaller costs than conventional gravity based systems. • SW – Early work suggests viability for a stormwater management system can be developed to accommodate proposed growth. However, more technical assessment required.	Good option for development. Costs to consider; • WW ○ Pressure sewer system and bulk transfer line to link with existing infrastructure to convey wastewater to existing WWTP via existing pumpstations and rising mains – which will need upgrading, plus additional river crossing to link directly to WWTP ○ A new WWTP is being considered (PDP, 2024) W of the Waioeka River to cater for WW from Hukutaia and Waiotahe – adding resilience by reducing burden on existing WWTP and providing an alternative site if existing site is compromised (i.e. from a natural hazard) – await update • W ○ Water supply resilience options in the form of additional storage and or an additional (3rd) water pipe-crossing at Stoney Creek Rd to Hukutaia and added water boosting/storage in Hukutaia are being considered by ODC (Ref WSP 2021). Upgrades will benefit Waiotahe Drifts and Dunes developments. • SW ○ Stormwater management with downstream ponding can be increased for mitigation purposes ○ Ōpōtiki Hukutaia Stormwater Concept design report dated August 2022, provides overview of treatment and attenuation requirements together with location of upgrades and new infrastructure
O2 Waiōtahe / The Drifts Add 116 units		Greenfield	Poor	• W - has limited growth potential as existing area is fairly developed and has as supply constraints. Would benefit from additional storage and pressure boosting. Assumed adequate bulk water supply and storage to support low growth but upgrades required to support larger growth. • SW - Existing area is fairly developed and little evidence that this area will be infilled. • WW - Expanding Waiōtahe / the Drifts & along Paerata Ridge is possible, may require WWPS upgrade and will need increase in emergency storage or install a pressure sewer network. One river crossing is a resiliency issue.	Good option for development. Costs to consider; • WW ○ Pressure sewer system and bulk transfer line to link with existing infrastructure to convey wastewater to existing WWTP via existing pumpstations and rising mains – which will need upgrading, plus additional river crossing to link directly to WWTP ○ A new WWTP is being considered (PDP, 2024) W of the Waioeka River (being assessed by PDP, 2024) which could cater for WW from Hukutaia and Waiotahe – adding resilience by reducing burden on existing WWTP and providing an alternative site if existing site is compromised (i.e. from a natural hazard) Current work suggests this option is unlikely within the next 20 years but is still being considered, • W ○ Water supply resilience options in the form of additional storage and or an additional (3rd) water pipe-crossing at Stoney Creek Rd to Hukutaia and added water boosting/storage in Hukutaia are being considered by ODC (Ref WSP 2021). Upgrades will benefit Waiotahe Drifts and Dunes developments. • SW ○ Stormwater management with downstream ponding can be increased for mitigation purposes ○ Influenced by climate change to which Waiotahe has limited ability to adapt, flood risk in the eastern areas from Waioeka River and coastal influences ○ Ōpōtiki Hukutaia Stormwater Concept design report dated August 2022, provides overview of treatment and attenuation requirements together with location of upgrades and new infrastructure

Option area	Type	Rating – ref section 14	Comments (EBoP Spatial Plan working group) - ref section 15 DOR	Further Comments CKL (incorporating working group review) - February '25

O4 Paerata Ridge	Greenfield	Poor	• Has capacity for growth
			• Expanding along Paerata Ridge is possible, may require WWPS upgrade and will need increase in emergency storage or install a pressure sewer network. One river crossing is a resiliency issue.
			• Can connect to wider system
				• W
				  ○ Bore water, reticulation is via a private scheme and likely to remain as such. If change, link to Ōpōtiki supply (bifurcation Waiotahe connection), but pending cost.
				  ○ Alt - boosting water onto the ridge from Ōpōtiki main to Waiotahe (bifurcation) + provision for additional storage.
				• WW
				  ○ Likely stay on septic tanks but option to pump WW to Waiotahe for transfer to ODC WWTP but economics need consideration – upgrade delivery main, emergency storage.
				  ○ However, that could encourage the consideration of a WWTP west of the Waioeka River to accommodate this expansion adding resilience by reducing burden on existing WWTP and providing an alternative site if existing site is compromised (i.e. from a natural hazard). Current work suggests this option is unlikely within the next 20 years but is still being considered, SW
				  ○ Elevation can provide good conveyance, treatment and attenuation in lower areas. Influenced by outlet to the receiving environments.

O5 Ōpōtiki town	Infill	Fair	• W - Adequate water supply
			• WW - Can connect to wastewater however further assessment and work is required to reduce inflow and infiltration into the network to accommodate growth.
			• SW – Infill within Opotiki township between the rivers will add pressure to an already under pressure stormwater network and existing at risk low lying areas. Duke Street flood protection options underway by District Council to reduce floodwater from the rural catchment making it's way into the urban area.
			• Regional flood modelling implications need assessment.
				• W
				  ○ Tap into existing source - ok
				• WW
				  ○ Infill incurs costs as needed – WW could use pressure sewers to minimise I/I. Capacity of WWTP will need upgrades, pending volume of infill/ uptake/ limitations.
				  ○ However, if new WWTP west of the Waioeka River could free up capacity.
				• SW
				Key stormwater projects are underway which include the following
				  ○ Rural-Urban flood protection with southern limit of Duke Street
				  ○ Transfer oof flood flows from Otara to Waioeka River flood plain
				  ○ Duke street pump station
				  ○ Tarawa Creek Pumpstation upgrade
				• BoPRC Waioeka Otara River Scheme model currently being updated to inform the development of 100yr river strategy and BOPRC reliance projects.
				• Township lays between the two rivers therefore flood hazard assessment to be undertaken for any infill proposal. Refer to Climate and Resilience workstream being undertaken by others in the EBoP Spatial Plan project team

O4 Paerata Ridge	Rural residential	Fair	• W - Water supply needs to be extended and additional storage and boosting would be required.
			• WW - Expanding WW along Paerata Ridge is possible, but would require additional pumping, main upgrades and possible emergency storage. A pressure sewer network could be considered. One river crossing is a resiliency issue and investing in Paerata infrastructure may stretch capital resources to also develop areas like Hukutaia.
				• W
				  ○ Could be left as-is (self sufficient, private bore and reticulation/water harvesting and septic tanks).
				• WW
				  ○ Option to pump WW to Waiotahe for transfer to ODC WWTP but economics need consideration – upgrade delivery main, emergency storage.
				• SW
				  ○ Stormwater to have a catchment wide approach to achieve best practicable outcomes
				  ○ Discharge with on-site management without effecting downstream properties

O3 Tablelands	Rural residential	Fair	Rural residential supply would continue to be fed from existing sources/rain tanks (harvesting) i.e. generally self-sufficient.	Nil
O6 Ohiwa	Rural residential	Fair	Rural residential supply would continue to be fed from existing sources/rain tanks (harvesting) i.e. generally self-sufficient.	Nil

Option area	Type	Rating – ref section 14	Comments (EBoP Spatial Plan working group) - ref section 15 DOR	Further Comments CKL (incorporating working group review) - February '25
Whakatāne District				

W1 Awakeri	Greenfield	Good	• Support growth with a stormwater catchment management plan integrated with urban planning and green infrastructure for resilient outcomes.
			• Has water supply storage constraints (low elevation, low capacity), however could draw from future Paul Road supply enroute to Whakatāne south – improve pressures in town.
			• Can reticulate and pump to upsized existing WWTP(s) or build a new regional WWTP and treat/dispose locally.
				• W
				  ○ Linkage to proposed Primary trunk main proposed. Otumahi water reservoir and pipeline will improve pressure and flow and add resilience
				  ○ Need to install PRV's at connections to the proposed Primary main for pressure management
				• WW - reticulation and treatment and disposal the challenge – space and cost. WW – options;
				  ○ pump Awakeri WW to the upgraded plant in Whakatane – flow and cost of pipeline and pumpstation – approx. 12km pipeline
				  ○ OR develop new WWTP here and (optionally) accept WW from Edgecombe and Fonterra (assume pre-treated?) Further investigate area for land disposal and cost.
				• SW - as per working group comments
				  ○ stormwater catchment management plan integrated with urban planning and green infrastructure for resilient outcomes.
				  ○ Considerations of the River flooding modelling due to climate change
				  ○ Integration of discharge to the Rangitaiki Drainage scheme

W4 Tāneatua	Greenfield	Poor	Area under investigation for fluvial river flooding	• W
				  ○ Upgrades by renewals (bore) program to cater for 200 (or 20- confirm number) (Future Development Options, 2024) additional houses.
				• WW
				  ○ WWTP (pond) is due for consent renewal – may need upgrades.
				• SW
				  ○ Fluvial river flooding considerations limit SW management options

W3 Matatā	Greenfield	Good	• As a growth node has sufficient access to water from Jennings Spring with no significant constraints.
			• Expansion of the piped infrastructure to the east for growth on the edge of the Tarawera plains
			• Currently planning a new WWTP – if consented and built will be easy to accommodate further growth but will require further assessment.
			• Catchment wide approach to SW management.
				• W
				  ○ Assume upgrade storage in short term to cater for 400 houses (140 houses in addition to 260 existing), possible to also link to Braemar for additional supply (4km pipe approx. 200DIA) if eastern development expands to 1500 houses.
				• WW
				  ○ Refer PDP estimates and numbers (2024) - short-med term infill only – 400 houses catered for (refer above) using STEP system, SBR plant and land disposal.
				  ○ Further development hinges on WW treatment and disposal, so a key consideration. If feasible, future, longer term 1500 houses to eastern area will require even more substantial WWTP and significant disposal area.
				• SW
				  ○ stormwater catchment management plan integrated with urban planning and green infrastructure for resilient outcomes.
				  ○ Considerations of the River flooding modelling due to climate change
				  ○ Integration of discharge to the Tarawera River and the Rangitaiki drainage scheme. Eastern area likely to include communal stormwater management options.

Option area	Type	Rating – ref section 14	Comments (EBoP Spatial Plan working group) - ref section 15 DOR	Further Comments CKL (incorporating working group review) - February '25

W2 Te Teko	Greenfield	Good	• Growth provides opportunity to support a catchment wide approach to stormwater management in a comprehensive manner and develop a resilient SW network.
			• Requires upgrade to reticulation, treatment and storage and new water source for significant growth – well situated for supplementation from Otumahi scheme (current).
				• W
				  ○ Requires additional water storage. However, linkage to the Otumahi scheme could mitigate current risk of influence of Rangitaiki river level on existing shallow bore and improve resilience of supply.
				• WW
				  ○ Currently on septic tanks so would require a new WWTP OR pump back to Kawerau (current capacity but plan change needed as it is currently a prohibited activity)
				• SW
				  ○ stormwater catchment management plan integrated with urban planning and green infrastructure for resilient outcomes.
				  ○ Considerations of the River flooding modelling due to climate change
				  ○ Integration of discharge to the Rangitaiki River and the Rangitaiki drainage scheme

W5 Minginui	Greenfield			• Aspiration to place a further 50 houses. • W covered by renewals • WW - Septic tanks for management of WW, privately owned

W6 Murupara	Greenfield			• W
				  ○ Shallow spring, no treatment currently, but being considered – would need upgrading
				• WW
				  ○ WWTP (pond) consent needs renewal 2026 and upgrade to suit
				• SW
				  ○ Comprehensive SMP to be developed to guide catchment wide approach

W7 Whakatāne town, excluding Kopeopeo	Infill	Fair	• Assumed adequate bulk water supply and storage to support low/short term growth. Constraints are reliability of source water. Good opportunity to link to future schemes and boost resilience.
			• WWTP has scope to upgrade (25ha ponds) due to land already purchased.
			• Protection from flooding events currently via 14 pumpstations. Increase design capacity of current system to meet 10yr annual recurrence interval (ARI) standards.
			• Has climate change risks (coastal inundation, sea level rise, coastal flooding and groundwater rise that impact SW management).
				• W
				  ○ Opportunity to be supplied by via primary and/or secondary main – more resilient supply in future, reduce risk and challenges of current supply. Costs = bulk pipelines + additional local storage (ref McKenzie report) and distribution network upgrades
				• WW
				  ○ Option for expansion (land already purchased) and potentially accept WW from Awakeri for ocean discharge
				  ○ Cost of pumpstation and pipe option to accept Edgecumbe and Fonterra (pre-treated) (and/or Matata?) wastewater to be assessed – compare options capex and operational costs (NPV)
				• SW
				  ○ Resilience to the SW pump network is currently underway
				SW- options for consideration
				  ○ Limited areas for infill, extent to be developed through district plan updates
				  ○ Catchment wide modelling includes climate change considerations to guide planning
				  ○ Integration with the overall Whakatāne-Tauranga Rivers Scheme

Option area	Type	Rating – ref section 14	Comments (EBoP Spatial Plan working group) - ref section 15 DOR	Further Comments CKL (incorporating working group review) - February '25
W8 Kopeopeo	Infill			• W ○ Opportunity to be supplied by via primary and/or secondary main – more resilient supply in future, reduce risk and challenges of current supply. Costs = bulk pipelines + additional local storage (ref McKenzie report) and distribution network upgrades • WW ○ Option for expansion (land already purchased) and potentially accept WW from Awakeri for ocean discharge ○ Cost of pumpstation and pipe option to accept Edgecumbe and Fonterra (pre-treated) (and/or Matata?) wastewater to be assessed – compare options capex and operational costs (NPV) • SW ○ Resilience to the SW pump network is currently underway *SW- options for consideration* ○ Limited areas for infill, extent to be developed through district plan updates ○ Catchment wide modelling includes climate change considerations to guide planning ○ Integration with the overall Whakatāne-Tauranga Rivers Scheme
W10 Ohope Beach	Infill	Fair	• Can manage its own growth capacity needs. • Existing upgrade of stormwater network in Ōtarawairere, opportunities for further connections limited. • Has climate change risks (coastal inundation, sea level rise, coastal flooding and groundwater rise that impact SW management).	• W ○ Link from Valley Rd reservoirs and Bridger Glade Pumpstation dependency/risk? – increase size (current size?) of storage at Otarawairere? ○ Primary trunk main would provide additional supply resilience to reservoirs • WW ○ Continue pumping to Whakatane WWTP • SW ○ Climate change effects, including coastal inundation sea level rise, groundwater interaction ○ Pipe capacity analysis to support future connection
W9 Matatā	Infill	Good	• Matatā's water supply is adequate for short term growth with minimal upgrades required. More substantial growth will require connection to an additional source (Braemar) for increased resilience. • Water losses are high and better use of assets could be realised by minimising losses through water-loss reduction interventions.	• W ○ Supply from Jennings spring and current storage ok, water loss reduction plan underway • WW ○ – currently on septic tanks and could remain as such if further development did not proceed in short term. ○ Include OSET system in short term to allow for infill of up to approximately 140 houses ○ Longer term WW reticulation and local treatment/ land disposal could be considered • SW- ○ Climate change effects, including coastal inundation sea level rise, groundwater interaction ○ Discharge through to the current SW system including wetlands ○ Pipe & wetland capacity analysis to support future connections ○ Climate change effects, including coastal inundation, sea level rise, groundwater interaction

Option area	Type	Rating – ref section 14	Comments (EBoP Spatial Plan working group) - ref section 15 DOR	Further Comments CKL (incorporating working group review) - February '25
W11 Thornton dunes	Rural residential	Fair	• Water supply accessible from plains Matatā/Whakatāne/schemes for growth. • Current supply understood to be adequate and limited growth under this scenario assumed to be sustainable – could however be supplemented by Matatā or schemes link in future • Current infrastructure aligned with road network. • Establish catchment wide approach for good environmental outcomes. • Growth in Thornton can benefit from supply from Matatā and/or potential linkage between Braemar/Paul Road and the Plains.	• W ○ Current supply is limited by the 50DN supply line from the Palins. However, option to increase pipe size (to approx. 150DN) and storage to accommodate supply for future growth. • WW ○ Septic tanks currently. Consider staying on septic tanks in short term. Future - localised treatment (package plant -potential) and disposal vs pumping to Opotiki WWTP – pending growth • SW ○ Stormwater to have a catchment wide approach to achieve best practicable outcomes ○ discharge with on-site management without effecting downstream properties ○ management to discharge through Rangitaiki Drainage scheme
W12 Manawahe	Rural residential	Fair	Rural residential supply would continue to be fed from existing sources/rain tanks (harvesting) i.e. generally self-sufficient.	Assumed stay as-is
W13 Ohiwa Harbour	Rural residential	Fair	Rural residential supply would continue to be fed from existing sources/rain tanks (harvesting) i.e. generally self-sufficient.	Assumed stay as-is
Kawerau District				
K1 Roy Stoneham Park	Greenfield	Good	• Water source and supply capacity is adequate to support growth in Kawerau. • WW treatment can be upsized for local growth. • SW existing capacity within the township	• W ○ Water source and volume of storage reported as acceptable and sufficient contingency supply. If required, high water consumption could be managed with rates/water-metering/tariff • WW ○ WW treatment and disposal – sufficient capacity and contingency reportedly exists, room for upgrading WWTP process and extending disposal area (pumice) • SW ○ Remains as per the current capacity
K2 Hardie/Beattie Ave area	Greenfield	Good	• Water source and supply capacity is adequate to support growth in Kawerau. • WW treatment can be upsized for local growth. • SW existing capacity within the township. Groundwater issues, high water table leads to localised flooding.	• W and WW ○ As above • SW ○ Design needs to be cognisant of the groundwater issues
K3 Valley Road	Greenfield	Poor	• Water source and supply capacity is adequate to support growth in Kawerau. • WW treatment can be upsized for local growth. • SW existing capacity within the township • Remaining undeveloped area of Residential Zone is steep and contains numerous archaeological sites.	• Need to enquire why poor – potentially could be archaeological and topographical constraints
K4 Kawerau town	Infill	Good	• Water source and supply capacity is adequate to support growth in Kawerau. Upgrades could be planned to suit growth. • WW treatment can be upsized for local growth. • SW existing capacity within the township	• W and WW ○ As above • SW ○ Design needs to be cognisant of existing pipe capacity
K5 Western rural area	Rural residential	Fair	Rural residential supply would continue to be fed from existing sources/rain tanks (harvesting) i.e. generally self-sufficient	• SW ○ Stormwater to have a catchment wide approach to achieve best practicable outcomes, check in with KDC CoP ○ discharge with on-site management without effecting downstream properties

Appendix 3 Assessment of Wastewater treatment and land disposal requirements

Memo

Date:	26 February 2025
To:	John Sternberg – CKL Ltd
	Bronwyn Rhynd – CKL Ltd.
From:	Trisha Simonson – Ormiston Associates Ltd.
Subject:	**Our Places – Eastern Bay Spatial Plan**
	Wastewater Land Disposal Feasibility

Further to your instructions of 23 January 2025, the following observations, comments and recommendations are provided with regard to land discharge of treated effluent at Hukutaia, Awakeri and Matatā. Our work is based on desk top information and general regional knowledge only, we have not undertaken site visits or soil investigations at any of the locations.

1. Background and Brief:

We understand that the Whakatāne, Kawerau, and Ōpōtiki District Councils are working with iwi, government agencies and Toi Moana Bay of Plenty Regional Council to create a spatial plan that will shape the future of development in the Eastern Bay of Plenty. The 'Our Places – Eastern Bay Spatial Plan Scenarios and Development Options Report: Draft version for engagement' was released in October 2024 for consultation. CKL have been engaged to provide professional advice with respect to three waters services and infrastructure. The October 2024 report has identified a short list of emerging preferred residential development options over multiple time periods (short term, medium term etc.). Within the preferred development areas, three locations have been identified as needing further advice regarding the feasibility of land disposal of treated wastewater. These areas include Hukutaia (west of Opotiki), Awakeri and Matatā.

Our brief was to provide, for each of the three areas:

- Estimate of soil types
- Estimated flow volumes. Assume approximately 200 l/p/d x 2.6 p/house (Awakeri, Matatā) and 2.95 p/house for Hukutaia for flow estimates.
- Advice on appropriate treated wastewater land disposal options (drip. LPED, other ?)
- Estimated land disposal application rates (mm/d)
- Estimated land disposal areas required (please also offer guidance on reserve area requirements)
- If treatment type plays a role in the above (effluent quality), please provide an estimated area for a typical pond treatment system and alternatively a more sophisticated e.g. Sequencing Batch Reactor/Membrane Bioreactor/other treatment plant for Hukutaia and Awakeri, noting that for Matatā, Whakatane District Council have already opted (conceptually) for a SBR.

We provide the following information and further comment and analysis:

General Notes on Wastewater Discharge to Land Methodologies:

As background to the individual site analysis to follow, we note that a range of wastewater disposal to land methodologies exist, and provide a brief description of those relevant to this project, along with positive and negative attributes.

Conventional Soakage Trenches and Beds:

These systems rely on soakage of treated effluent into the ground from a constructed trench, or wider bed, which includes a distribution pipe set into drainage aggregate. The method is only applicable to soils with moderate to good soakage, i.e. category 5 or better (AS/NZS 1547: 2012[1]). Either primary or secondary treated effluent can be discharged using this method, with higher loading rates allowed for secondary treated effluent. Loading rates use the base of the trench/bed only, and are higher than that allowed for the area-based systems such as PCDI or LPED. These systems will use less land area than PCDI but are approximately 4 times more expensive to install. Conventional systems require level ground to operate effectively, and large systems need to be dosed by pump. Vegetation maintenance may be problematic and expensive.

Pressure Compensating Dripper Irrigation (PCDI):

PCDI discharges secondary quality or better treated effluent only, through emitters or holes, in a small diameter plastic pipeline. The system discharges effluent at a low rate over a large area, at pressure via pumps. PCDI can be installed on sloping sites due the pressurise compensating emitters within the lines. They are relatively inexpensive, but require treated effluent having consistently low levels of suspended solids and Biochemical Oxygen Demand to function effectively, and take up a large area. PCDI can be used in all soil types.

Low Pressure Effluent Distribution (LPED):

The use of Low Pressure Effluent Distribution (LPED) as a disposal system option does not provide any advantages over PCDI and is more expensive to install, hence this is not assessed further.

Spray Irrigation:

Spray irrigation of treated effluent can be achieved via pop-up sprinklers, gun-sprinklers or a centre-pivot system. Irrigation is generally only undertaken at nighttime to reduce the public health risks of aerosol production which is where tiny droplets of wastewater can become airborne and float across the air for great distances. This can present risks via pathogens in the wastewater. Due to nighttime irrigation only, storage of treated wastewater needs to be accounted for in a treatment system design. Aerosols can be limited by the establishment of shelter belts and use of buffer zones. Spray irrigation discharge rates can be higher than area based systems depending on soil types and environmental constraints. Risks can be limited by improved levels of treatment. Vegetation management can be easily achieved, and even used for fodder crops or timber production.

Wetland Polishing and Discharge:

While constructed wetlands may include a final discharge to water, there are some advantages to their use to provide final polishing of wastewater and land contact after a treatment system. Sizing and design is a very specific field of expertise, and any wetland could be expected to require a large footprint.

[1] Australian/New Zealand Standard 1547:2012 On-site domestic wastewater management

2. Hukutaia (Opotiki)

Receiving Environment:

Soil maps indicate the area is underlain by multiple soil types including predominantly imperfectly drained Hanaia silty and sandy loam soils (category 4) in the low-lying northern half, poorly drained peaty Mateo soils (category 5) in the central valley and well drained Opotiki sandy loam soils (category 2) on the higher ground to the south. Soil maps for each site are included at the end of this document. The identified area includes drains and watercourses in the northern area which ultimately discharge to the Waioeka River. Land slopes are generally gentle at 5°, with the eroded valley slopes moderately steep at up to 25°. The lower lying area to north is noted as experiencing infrequent flooding, while the higher ground is not noted to flood. No information on groundwater level is available.

Potential Discharge Volumes:

3,000 houses x 2.95 people per house = 8,850 people
8,850 people x 200 litres/person/day = 1,770 m^3/day (1,770,000 litres/day).

Wastewater Treatment Levels and Land Disposal Options:

The level of wastewater treatment in combination with the soil type at each site will dictate which disposal methods are available for use.

Primary treatment quality

Primary treatment systems or traditional facultative oxidation ponds will not reduce suspended solids to an acceptable level (<30gm/L) to allow the use of pressure compensating dripper irrigation (PCDI), and would also require the use of lower basal loading rates to utilise conventional soakage trenches or beds. Given the volume of wastewater to be discharged, conventional soakage systems based on primary treated effluent are likely to be high in cost. Spray irrigation may be an option; however, this would raise concerns regarding aerosol production, odour and public health risks using primary treated effluent.

Secondary treatment quality

We would expect that any new wastewater treatment plant would reach at least secondary wastewater quality, due to council policies and the expectations of iwi and the public. On the basis of secondary treatment quality and that the majority of the site is underlain by category 4 soils, the most appropriate disposal method at this location will likely be pressure compensating dripper irrigation (PCDI). If the effluent was also disinfected, spray irrigation may be an option. Should the disposal area be located in the Opotiki sandy loam soils then conventional soakage beds with a high loading rate would be an option, however, level land is required for the installation of beds and the sandy loam soils to the south appear to be located on gently slopes. The use of a wetland for further polishing of effluent and ultimate discharge to water may also be an option, as it could satisfy iwi concerns regarding land contact.

Loading rates:

All loading rate calculations provided in this document are based on the recommendations within AS/NZS1547:2012, however it is worth noting that the Standard provides guidance for smaller scale domestic situations, and potentially higher rates may be able to be justified in any design, based on site specific information.

On the basis of secondary treated wastewater and PCDI discharge to category 4 soils, the loading rate recommended by AS/NZS 1547:2012 Table M1 is 3.5 mm/day (3.5 l/m^2/day).

Discharging secondary treated effluent into conventional beds or trenches in category 4 soils could utilise a basal loading rate of up to 30 mm/day (30 l/m^2/day) (Table L1).
If the disposal area was located within the category 2 Opotiki sandy loam soil, the PCDI rate would be 5 mm/day, and the conventional bed/trench rate would be up to 50 mm/day.

Area-based spray irrigation rates of tertiary treated wastewater could be higher than PCDI based systems, but would need to be specifically designed after investigation into soils including disc permeameter testing. Any spray irrigation system would need to incorporate significant buffer zones around the irrigation site to protect against aerosol formation and spray drift.

Wetland sizing would require site specific design by NIWA.

Disposal and Reserve Areas Required:
PCDI disposal of 1,770 m^3/day at 3.5 mm/day will require 50.6 hectares, in the category 4 soils.
PCDI disposal of 1,770 m^3/day at 5 mm/day will require 35.4 hectares, in the category 2 soils.

Conventional bed disposal of 1,770 m^3/day at 30 mm/day within the category 4 soils would require 5.9 hectares of basal soakage area, which would then require approximately 8 hectares enclosing area to account for the required spaces between the beds.
Conventional bed disposal of 1,770 m^3/day at 50 mm/day within the category 2 soils would require 3.5 hectares of basal soakage area, which would then require approximately 5 hectares enclosing area to account for the required spaces between the beds.

Given the scale of the development and that this is a municipal situation, the provision of a reserve disposal area may be able to be waived/avoided. As the system will be regularly managed and monitored, it is less likely that overloading or failure will occur. However, it may be prudent to set aside reserve land in case of unforeseen growth. In that case 50% of the above areas would likely be sufficient.

Treatment system area requirements:
Design sizing of facultative ponds is outside our area of expertise however based on the published guidelines of 1200 people per hectare of pond, approximately 8 hectares of pond would be required.

A Sequencing Batch Reactor treatment system serving this proposed population would likely require approximately 2 hectares of land, based on the system installed at Whitianga which has an SBR serving a population of approximately 7,000 people. At Whitianga a calamity pond is utilised to manage peak population events and extreme weather events, and this represents an additional 2 hectares of land.

Hukutaia Location Limitations/Potential Issues Identified:
Poorly drained soil
We do not have any information on the depth to groundwater which may limit land disposal options and the location of land suitable for land discharge.

3. Awakeri

Receiving Environment:

Two main soil types underlie the Awakeri identified area, the poorly drained Paroa soils (category 5) on peat lie in the southern part of the area with most of the sites underlain by the poorly drained Pongakawa peaty sand (category 5), which is mapped as very poorly drained on the S-Map. Flooding is noted to be protected by stopbank. The moderately well-drained Te Rahu loamy sand (category 3) lies some 500m to the north. The site is traversed by drains which discharge into the Te Rehu Canal which is located in the south-eastern corner of the identified area. The site is generally flat. Groundwater levels are known to be high, with the Awakeri School site identifying a winter groundwater level of 0.5m below ground surface.

Potential Discharge Volumes

3,300 houses x 2.6 people per house = 8,580 people
8,580 people x 200 litres/person/day = 1,716 m^3/day (1,716,000 litres/day).

Wastewater Treatment Levels and Land Disposal Options:

The level of wastewater treatment in combination with the soil type at each site will dictate which disposal methods are available for use.

Primary treatment quality

Primary treatment systems or traditional facultative oxidation ponds will not reduce suspended solids to an acceptable level (<30gm/L) to allow the use of pressure compensating dripper irrigation (PCDI), and would also require the use of lower basal loading rates to utilise conventional soakage trenches or beds. Given the volume of wastewater to be discharged, conventional soakage systems are likely to be high in cost. Given the high groundwater levels on site, conventional systems would need to be raised above ground level, using imported soil. Spray irrigation may be an option; however, this would raise concerns regarding aerosol production, odour and public health risks using primary treated effluent. Wetland treatment and discharge may be a viable option.

Secondary treatment quality

We would expect that any new wastewater treatment plant would reach at least secondary wastewater quality, due to council policies and the expectations of iwi and the public. On the basis of secondary treatment quality and that the majority of the site is underlain by category 5 soils, with a high groundwater table, the most appropriate disposal method at this location will likely be pressure compensating dripper irrigation (PCDI). If the effluent was also disinfected, spray irrigation may be an option. The use of a wetland for further polishing of effluent and ultimate discharge to water may also be an option, as it could potentially satisfy iwi concerns regarding land contact. Raised conventional soakage beds are also an option.

All disposal methodologies will be limited at this location by high groundwater levels. The required clearance to groundwater beneath a disposal system is noted in AS/NZS 1547:2012 to varies from 0.6m minimum to greater than 1.5m depending on the risk factors involved. Should groundwater levels be similar to Awakeri School, then the required groundwater clearance will not be met by PCDI which is generally installed at 100-150mm depth, or conventional soakage systems, which are generally installed at 450mm depth. The ground

surface will need to be raised to provide additional separation distances, or tertiary treatment with disinfection considered, and permission sought from BOPRC to employ a lesser separation distance.

Loading rates:

On the basis of secondary treated effluent and PCDI discharge to category 5 soils, the loading rate recommended by AS/NZS 1547: 2012 is 3 mm/day (3 l/m^2/day).

Discharging secondary treated wastewater into conventional beds or trenches in category 5 soils could utilise a basal loading rate of up to 12 mm/day (12 l/m^2/day).

If the disposal area was located within the category 3 Te Rahu loamy sand soil, the PCDI rate would be 4 mm/day and the conventional bed/trench rate would be up to 50 mm/day

Area-based spray irrigation rates of tertiary treated effluent could be higher than the PCDI rates, but would need to be specifically designed after investigation into soils including disc permeameter and double ring infiltrometer testing. Any spray irrigation system would need to incorporate significant buffer zones around the irrigation site to protect against aerosol formation and spray drift. Wetland sizing would require site specific design by NIWA.

Disposal and Reserve Areas Required:

PCDI disposal of 1,716 m^3/day at 3 mm/day will require 57.2 hectares, in the category 5 soils.
PCDI disposal of 1,716 m^3/day at 4 mm/day will require 42.9 hectares, in the category 3 soils.

Conventional bed disposal of 1,716 m^3/day at 12 mm/day within the category 5 soils would require 14.3 hectares of basal soakage area, which would then require approximately 18 hectares enclosing area to account for the required spaces between the beds.
Conventional bed disposal of 1,716 m^3/day at 50 mm/day within the category 3 soils would require 3.4 hectares of basal soakage area, which would then require approximately 5 hectares enclosing area to account for the required spaces between the beds.

Given the scale of the development and that this is a municipal situation, the provision of a reserve disposal area may be able to be waived/avoided. As the system will be regularly managed and monitored, it is less likely that overloading or failure will occur. However, it may be prudent to set aside reserve land in case of unforeseen growth. In that case 50% of the above areas would likely be sufficient.

Treatment system area requirements:

Design sizing of facultative ponds is outside our area of expertise however based on the published guidelines of 1,200 people per hectare of pond, approximately 8 hectares of pond will be required.

A Sequencing Batch Reactor treatment system serving this proposed population would likely require approximately 2 hectares of land, based on the system installed at Whitianga which has an SBR serving a population of approximately 7,000 people. At Whitianga a calamity pond is utilised to manage peak population events and extreme weather events, and this represents an additional 2 hectares of land.

Awakeri Location Limitations/Potential Issues Identified:

Poorly drained soil
High groundwater levels
Proximity to surface watercourses

4. Matatā

Receiving Environment:

The discharge location is mainly underlain by the Kopeopeo coarse loamy sand, which is described as well drained (category 2). The north-western corner of the site intersects the Opouriao fine sandy loam which is also well drained (category 2). The maps note that the area is subject to rare flooding. The site generally rises gently from the south-east to the north-west, with the area to the east of the drain crossing the site being almost at sea level. Groundwater levels may be a concern with water bores located in the area showing static water levels of 0.0m to 2.5m below ground level.

Potential Discharge Volumes:

1,500 houses x 2.6 people per house = 3,900 people
3,900 people x 200 litres/person/day = 780 m^3/day (780,000 litres/day).

Wastewater Treatment Levels and Land Disposal Options:

The level of wastewater treatment in combination with the soil type at each site will dictate which disposal methods are suitable for use.

Secondary treatment quality

On the basis of secondary treatment quality from the proposed SBR and that the majority of the site is underlain by category 2 soils, with a potentially high groundwater table, the most appropriate disposal method at this location will likely be pressure compensating dripper irrigation (PCDI). Conventional soakage beds with a high loading rate may be an appropriate option, depending on groundwater levels, however these are more costly to install. If the effluent was also disinfected, spray irrigation may be an option. The use of a wetland for further polishing of effluent and ultimate discharge to water may also be an option, as it could satisfy iwi concerns regarding land contact.

All disposal methodologies could be limited at this location by potentially high groundwater levels. The required clearance to groundwater beneath a disposal system is noted in AS/NZS 1547:2012 to vary from 0.6m minimum to greater than 1.5m depending on the risk factors involved.

Loading rates:

On the basis of secondary treated wastewater and PCDI discharge to category 2 soils, the loading rate recommended by AS/NZS 1547: 2012 is 5 mm/day (5 l/m^2/day).

Discharging secondary treated wastewater into conventional beds or trenches in category 2 soils could utilise a basal loading rate of up to 50 mm/day (50 l/m^2/day).

Area-based spray irrigation rates of tertiary treated wastewater could be higher than PCDI rates, but would need to be specifically designed after investigation into soils including disc permeameter testing. Any spray irrigation system would need to incorporate significant buffer zones around the irrigation site to protect against aerosol formation and spray drift.

Wetland sizing would require site specific design by NIWA.

Disposal and Reserve Areas Required:
PCDI disposal of 780 m^3/day at 5 mm/day will require 15.6 hectares, in the category 2 soils.

Conventional bed disposal of 780 m^3/day at 50 mm/day within the category 2 soils would require 1.6 hectares of basal soakage area, which would then require approximately 3 hectares enclosing area to account for the required spaces between the beds.

Given the scale of the development and that this is a municipal situation, the provision of a reserve disposal area may be able to be waived/avoided. As the system will be regularly managed and monitored, it is less likely that overloading or failure will occur. However, it may be prudent to set aside reserve land in case of unforeseen growth. In that case 50% of the above areas would likely be sufficient.

Treatment system area requirements:
A Sequencing Batch Reactor treatment system serving this proposed population would likely require approximately 2 hectares of land, based on the system installed at Whitianga which has an SBR serving a population of approximately 7,000 people. At Whitianga a calamity pond is utilised to manage peak population events and extreme weather events, and this represents an additional 2 hectares of land.

Matatā Location Limitations/Potential Issues Identified:
Potentially high groundwater levels

5. Summary:

The information presented above is summarised in Table 1 below:

In summary, the determination of land area required for disposal of treated wastewater is dependent on treatment quality, soil type, disposal system methodology and vegetation maintenance. As we have not undertaken any site specific soil investigations, these conclusions may not be accurate.

There are potential issues of concern for the sites with high groundwater levels, in particular, Awakeri, however land disposal of wastewater on all sites is expected to be feasible, with the use of appropriate technologies and risk management.

Seasonally high groundwater may prevent winter irrigation and also limit the practical land disposal method to wetlands and possibly spray irrigation.

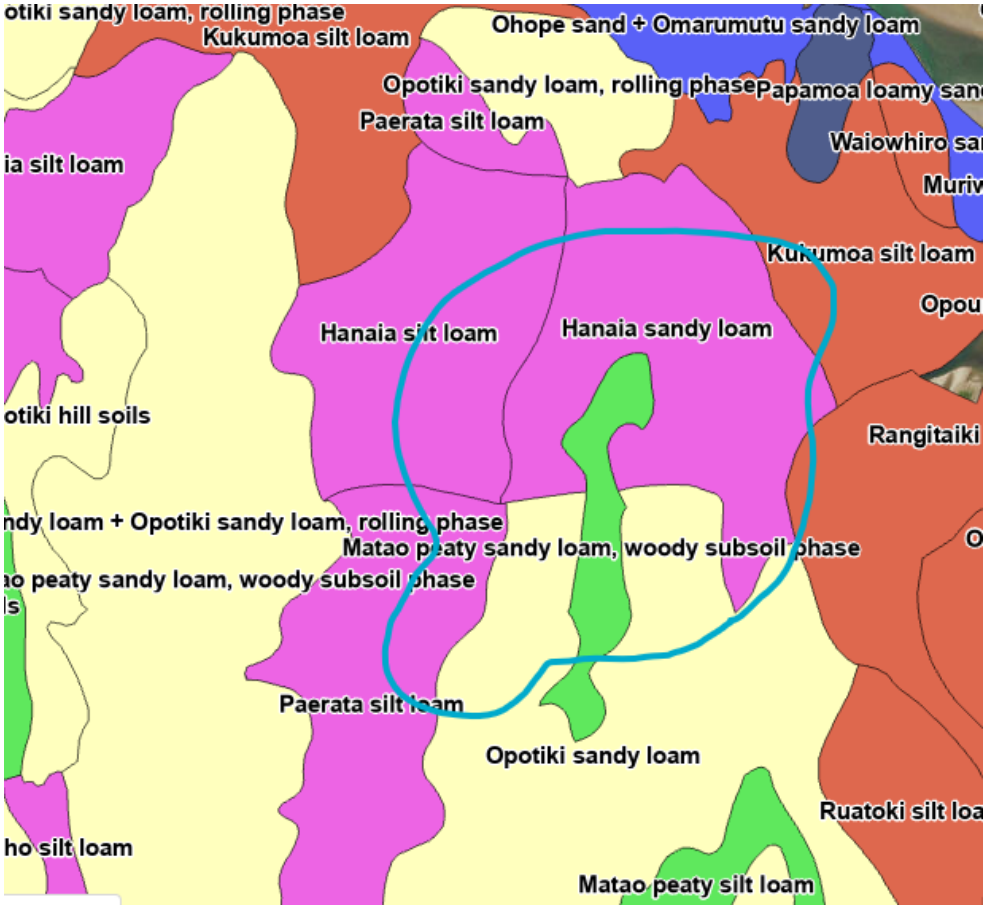
Wetlands and spray irrigation may be the only practical options in terms of shallow groundwater, seasonally high groundwater and practicality of vegetation maintenance.

Table 1: Summary of Information

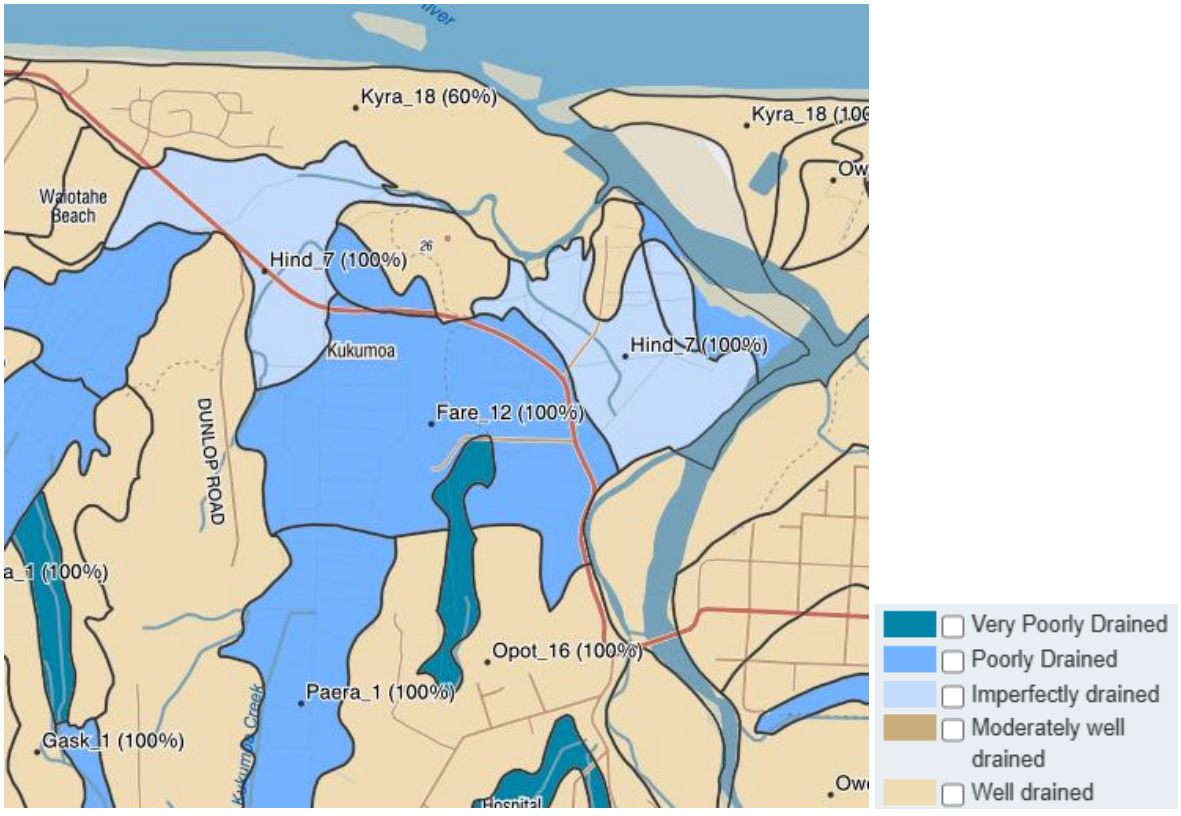
Parameter	Hukutaia	Awakeri	Matatā
Soil Type (BOPRC Map) Drainage characteristics (S-Map) Soil category (AS/NZS1547:2012)	Hanaia silt loam (imperfectly drained) category 4 Hanaia sandy loam (imperfectly drained) category 4 Matao peaty sandy loam, woody subsoil phase (poorly drained) category 5 Opotiki sandy loam (well drained) category 2	Paroa soils on peat (poorly drained) category 5 Pongakawa peaty sand (poorly drained) category 5 Te Rahu loamy sand (moderately well-drained) category 3:some 500m to the north	Kopeopeo coarse loamy sand (well drained) category 2 Opouriao fine sandy loam (well drained) category 2
Flow volume	3,000 houses x 2.95 people per house = 8,850 people 8,850 people x 200 litres/person/day = **1,770 m^3/day (1,770,000 litres/day).**	3,300 houses x 2.6 people per house = 8,580 people 8,580 people x 200 litres/person/day = **1,716 m^3/day (1,716,000 litres/day).**	1,500 houses x 2.6 people per house = 3,900 people 3,900 people x 200 litres/person/day = **780 m^3/day (780,000 litres/day).**
Wastewater disposal methodology options	Primary treatment: Conventional soakage system or spray irrigation (risks) Secondary treatment: PDCI Conventional soakage system Spray irrigation Wetland	Primary treatment: Conventional soakage system or spray irrigation (risks) Secondary treatment: PDCI Conventional soakage system Spray irrigation Wetland	Secondary treatment (SBR): PDCI Conventional soakage system Spray irrigation Wetland
Land disposal loading rates	Category 4 soils: PCDI = 3.5 mm/day Conventional Beds: 30 mm/day Spray and Wetland: specific design Category 2 soils: PCDI = 5 mm/day Conventional Beds = 50 mm/day	Category 5 soils: PCDI = 3 mm/day Conventional Beds: 12 mm/day Spray and Wetland: specific design Category 3 soils: PCDI = 4 mm/day Conventional Beds = 50 mm/day	Category 2 soils: PCDI = 5 mm/day Conventional Beds = 50 mm/day Spray and Wetland: specific design

Parameter	**Hukutaia**	**Awakeri**	**Matatā**
Land disposal areas required:	Category 4 PCDI = 50.6 Ha Category 4 Conventional Soakage = Basal soakage 5.9 Ha, enclosing 8 Ha Category 2 PCDI = 35.4 Ha Category 2 Conventional Soakage = Basal soakage 3.5 Ha, enclosing 5 Ha	Category 5 PCDI = 57.2 Ha Category 5 Conventional Soakage = Basal soakage 14.3 Ha, enclosing 18 Ha Category 3 PCDI = 42.9 Ha Category 3 Conventional Soakage = Basal soakage 3.4 Ha, enclosing 5 Ha	Category 2 PCDI = 15.6 Ha Category 2 Conventional Soakage = Basal soakage 1.6 Ha, enclosing 3 Ha
Reserve disposal areas required:	Plus 50%	Plus 50%	Plus 50%
Area for WWTP:	Facultative Pond Approx 8 Ha SBR approx. 2 Ha, calamity pond further 2Ha	Facultative Pond Approx 8 Ha SBR approx. 2 Ha, calamity pond further 2Ha	SBR approx. 2 Ha, calamity pond further 2Ha
Total Areas:	15.5Ha to 80Ha	15.5Ha to 94Ha	8.5Ha to 27Ha
Issues of concern:	Poorly drained soil Unknown groundwater levels	High groundwater levels Poorly drained soil Proximity to watercourses	Potentially high groundwater levels

Hukutaia

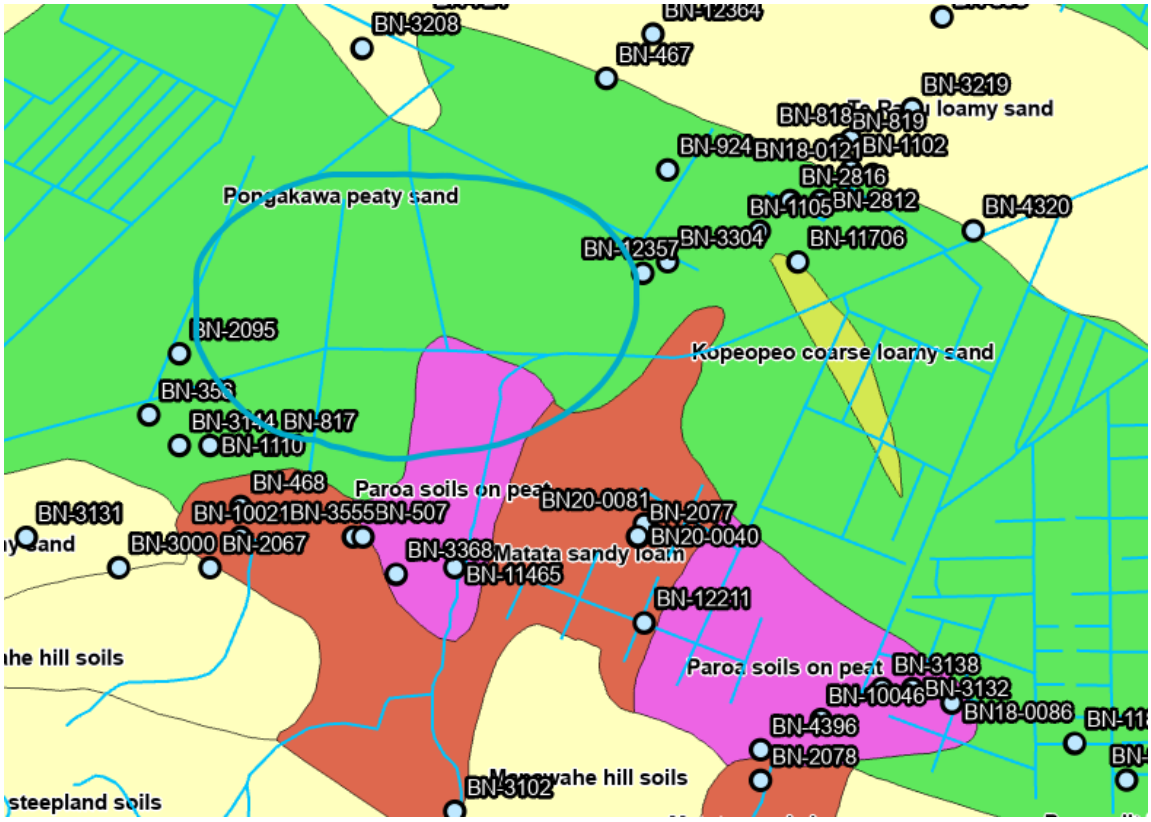


BOPRC Soil Maps

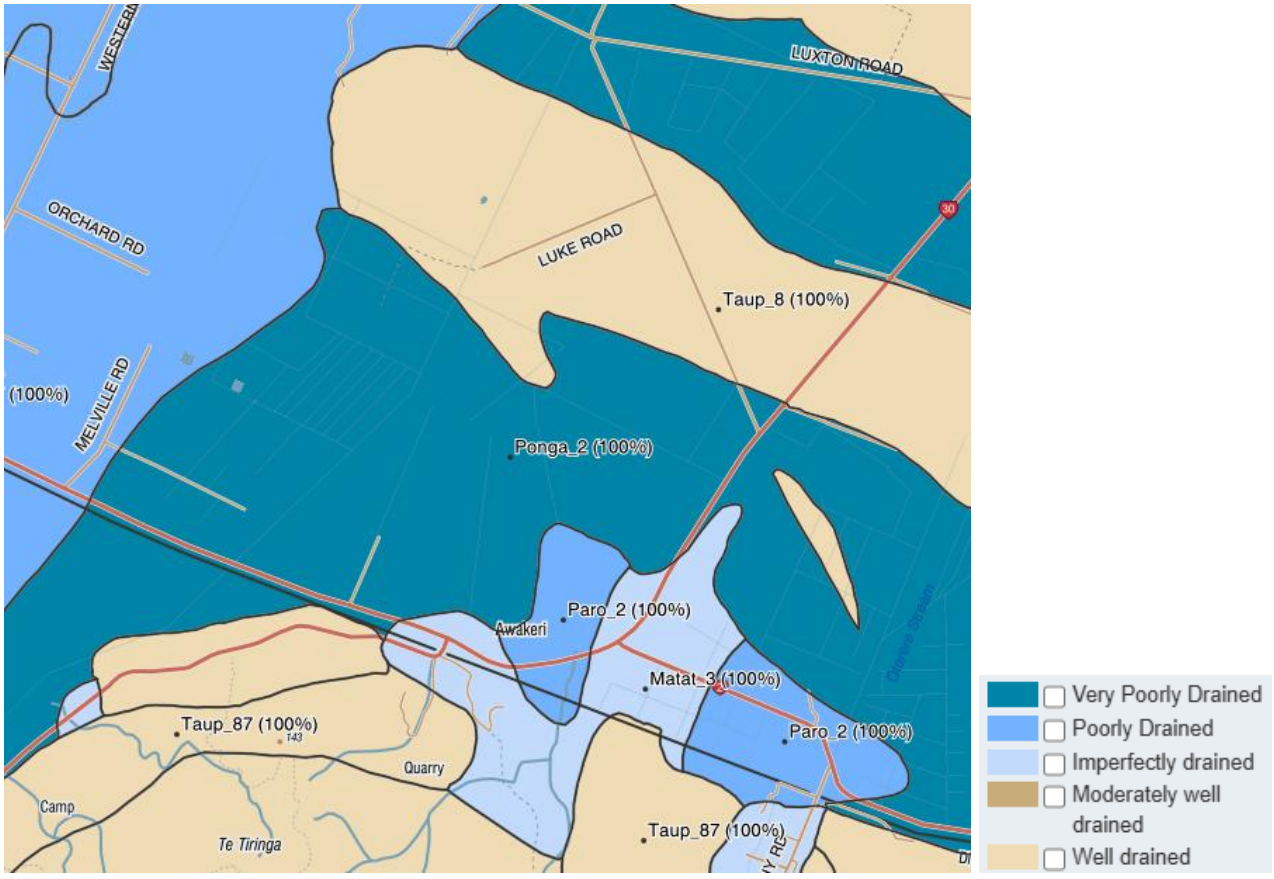


Landcare S-Maps

Awakeri

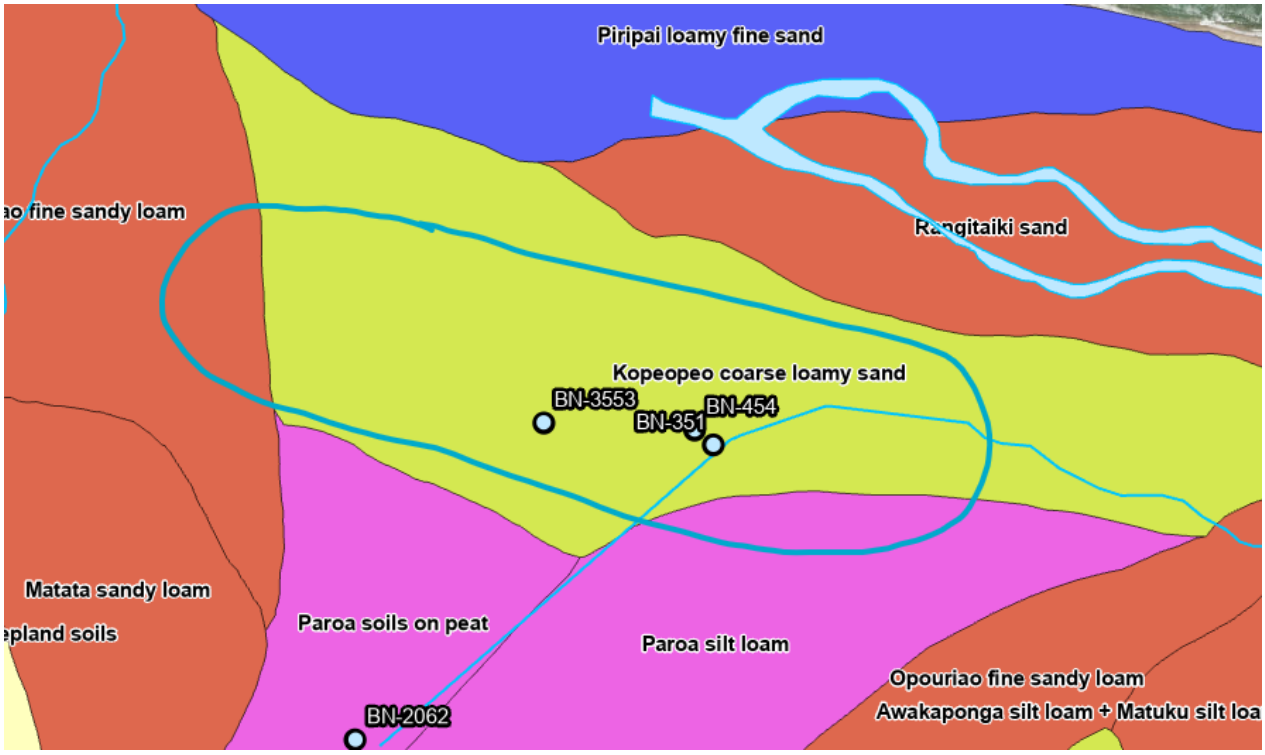


BOPRC Soil Maps

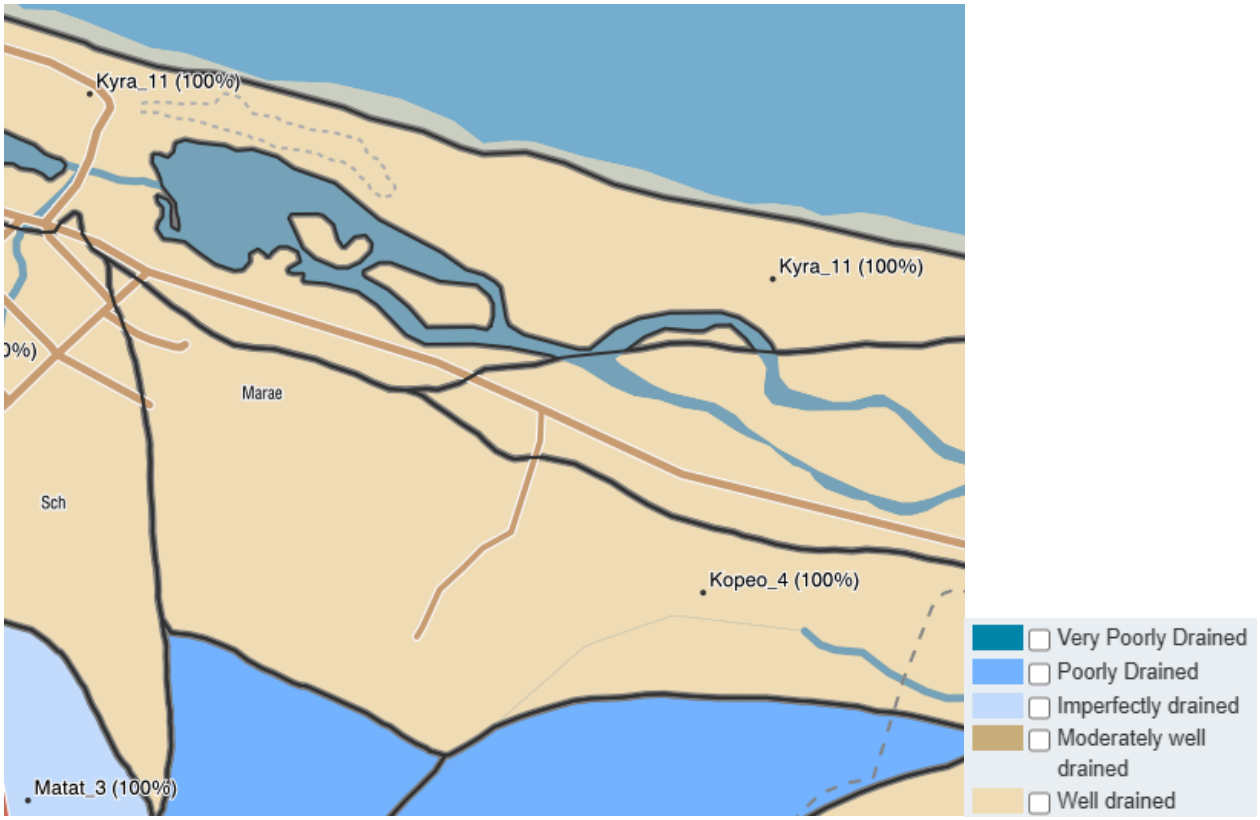


Landcare S-Maps

Matatā

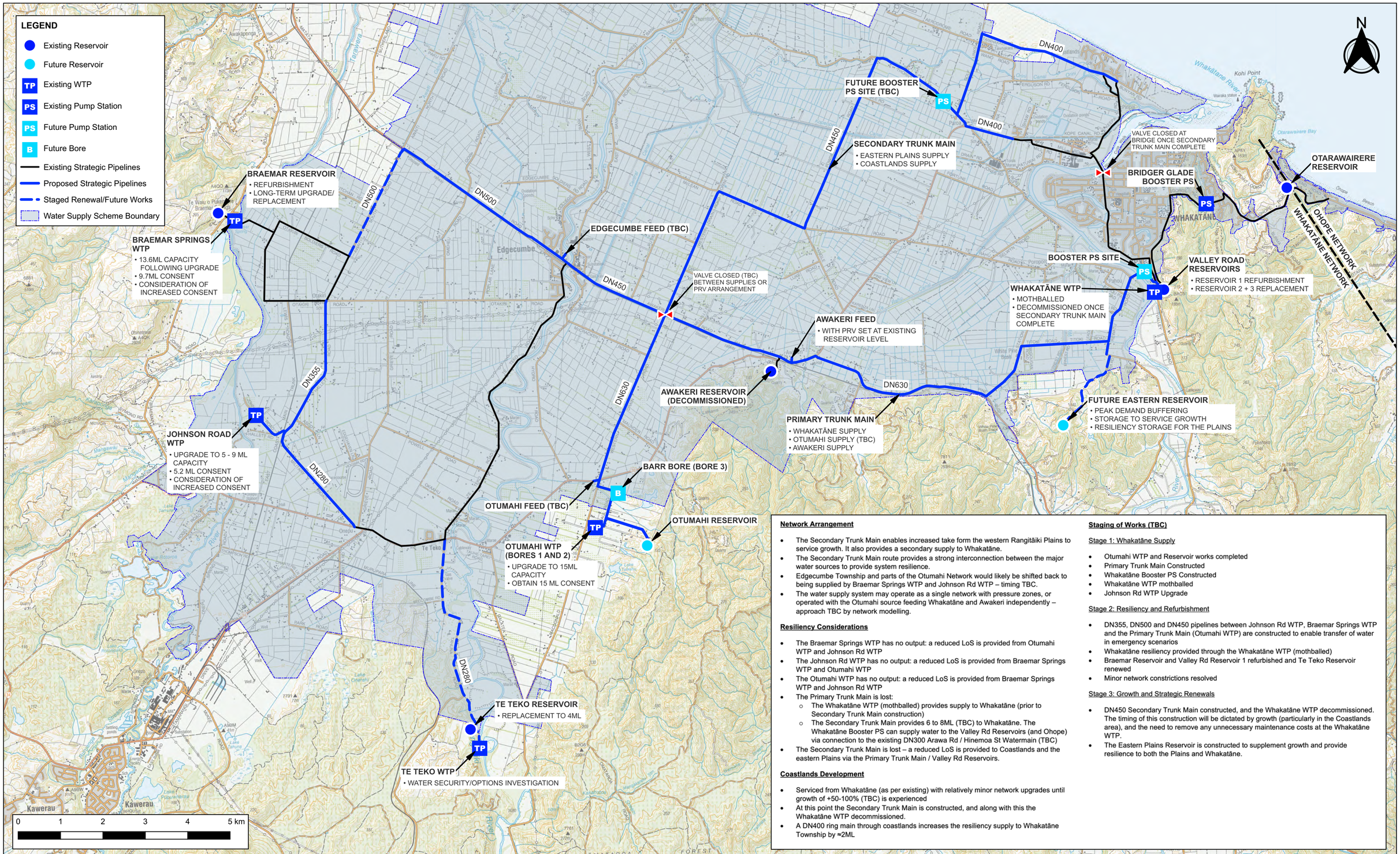


BOPRC Soil Maps



Landcare S-Maps

Appendix 4 Whakatāne Water Supply Strategy Concept Working Plan (McKenzie, 2022)



Network Arrangement

- The Secondary Trunk Main enables increased take form the western Rangitāiki Plains to service growth. It also provides a secondary supply to Whakatāne.
- The Secondary Trunk Main route provides a strong interconnection between the major water sources to provide system resilience.
- Edgecumbe Township and parts of the Otumahi Network would likely be shifted back to being supplied by Braemar Springs WTP and Johnson Rd WTP – timing TBC.
- The water supply system may operate as a single network with pressure zones, or operated with the Otumahi source feeding Whakatāne and Awakeri independently – approach TBC by network modelling.

Resiliency Considerations

- The Braemar Springs WTP has no output: a reduced LoS is provided from Otumahi WTP and Johnson Rd WTP
- The Johnson Rd WTP has no output: a reduced LoS is provided from Braemar Springs WTP and Otumahi WTP
- The Otumahi WTP has no output: a reduced LoS is provided from Braemar Springs WTP and Johnson Rd WTP
- The Primary Trunk Main is lost:
  - The Whakatāne WTP (mothballed) provides supply to Whakatāne (prior to Secondary Trunk Main construction)
  - The Secondary Trunk Main provides 6 to 8ML (TBC) to Whakatāne. The Whakatāne Booster PS can supply water to the Valley Rd Reservoirs (and Ohope) via connection to the existing DN300 Arawa Rd / Hinemoa St Watermain (TBC)
- The Secondary Trunk Main is lost – a reduced LoS is provided to Coastlands and the eastern Plains via the Primary Trunk Main / Valley Rd Reservoirs.

Coastlands Development

- Serviced from Whakatāne (as per existing) with relatively minor network upgrades until growth of +50-100% (TBC) is experienced
- At this point the Secondary Trunk Main is constructed, and along with this the Whakatāne WTP decommissioned.
- A DN400 ring main through coastlands increases the resiliency supply to Whakatāne Township by ≈2ML

Staging of Works (TBC)

Stage 1: Whakatāne Supply

- Otumahi WTP and Reservoir works completed
- Primary Trunk Main Constructed
- Whakatāne Booster PS Constructed
- Whakatāne WTP mothballed
- Johnson Rd WTP Upgrade

Stage 2: Resiliency and Refurbishment

- DN355, DN500 and DN450 pipelines between Johnson Rd WTP, Braemar Springs WTP and the Primary Trunk Main (Otumahi WTP) are constructed to enable transfer of water in emergency scenarios
- Whakatāne resiliency provided through the Whakatāne WTP (mothballed)
- Braemar Reservoir and Valley Rd Reservoir 1 refurbished and Te Teko Reservoir renewed
- Minor network constrictions resolved

Stage 3: Growth and Strategic Renewals

- DN450 Secondary Trunk Main constructed, and the Whakatāne WTP decommissioned. The timing of this construction will be dictated by growth (particularly in the Coastlands area), and the need to remove any unnecessary maintenance costs at the Whakatāne WTP.
- The Eastern Plains Reservoir is constructed to supplement growth and provide resilience to both the Plains and Whakatāne.

NOTES:
1. ALL PIPE SIZES SHOWN ARE FOR PE PIPEWORK (OD)
2. ALL ASSESSMENT AND ANALYSIS IS SUBJECT TO COMPREHENSIVE NETWORK MODELLING

A	Issued for Review	December 2022
Revision		Date

Planned by Warren McKenzie; Drawn by Aaron Falconer
Approved by Warren McKenzie

REVIEW ISSUE

Prepared for: WHAKATĀNE District Council — Kia Whakatāne au i ahau

Prepared by: Warren McKenzie CONSULTING LTD — SERVICE | QUALITY | INTEGRITY

Project: WDC 3152-001

WHAKATĀNE WATER SUPPLY STRATEGY

Title: CONCEPT WORKING PLAN

Scale	Project No.	Drawing No.	Revision
1:75,000	153	01	A

Appendix 3

Our Places Eastern Bay Spatial Plan Engagement Summary Report (2025)

The Our Places Eastern Bay Spatial Plan Engagement Summary Report was published under seperate cover.

Appendix 4

Eastern Bay Spatial Plan Transport analysis, Beca (2024)

Eastern Bay of Plenty Spatial Plan - Transport Analysis

Prepared for Whakatāne District Council
Prepared by Beca Limited

18 June 2024

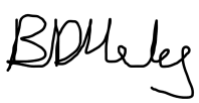
Contents

Appendices

Revision History

Revision N°	Prepared By	Description	Date
1.	Bryson Huxley, Vicky Li	Draft	17/04/2024
2.	Bryson Huxley, Vicky Li	Final	18/06/2024

Document Acceptance

Action	Name	Signed	Date
Prepared by	Bryson Huxley, Vicky Li		01/05/2024
Reviewed by	Craig Richards		02/05/2024
Approved by	Craig Richards		18/06/2024
on behalf of	Beca Limited		

1 Introduction

Beca Limited (Beca) has been commissioned by Whakatāne District Council to provide transport analysis services to inform the Eastern Bay of Plenty Spatial Plan (EBOPSP) project.

As part of this, a multimodal sketch planning tool (SPT) was developed to estimate transport outcomes using trasnport modelling techniques. The SPT was used to estimate comparative outcomes between different long term land use scenarios taking account of high level transport network improvement interventions. The multimodal tool estimates likely changes in daily travel demand by mode and emissions between areas within the study area, across car, public transport, walking, cycling and trucks.

The transport analysis also reviews the potential comparitave impacts on safety and resilience of the network arising from the EBOPSP land use options.

1.1 Study Area

Figure 1-1 depicts the study area and modelling extent (including Whakatāne and Ōpōtiki). The boundaries and numeric labels define the zone assumptions used in the sketch planning tool (including 54 internal zones highlighted by orange borders, and five external zones highlighted in pale blue boxes). Key potential EBOPSP development areas are coloured.

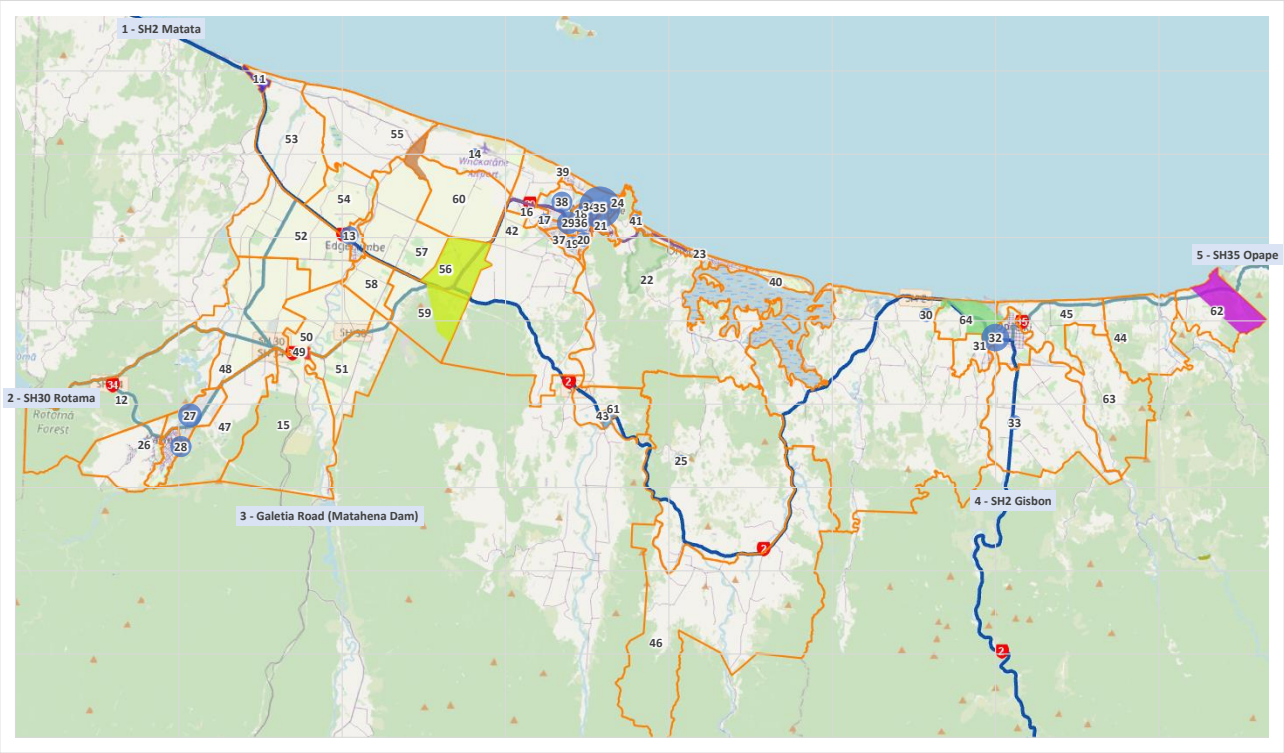


Figure 1-1: Model Extent and Zone Boundaries

2 Modelling Process

The SPT follows similar structure as a traditional four-stage transport model. The following diagram depicts the general model structure.

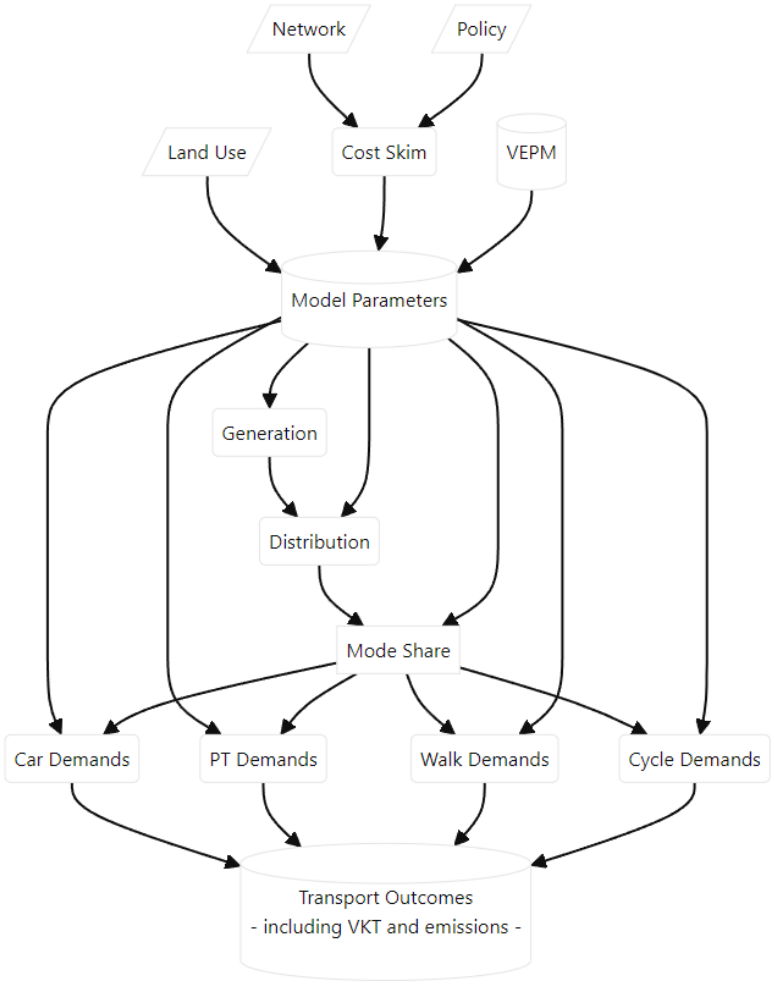


Figure 2-1. Model Prosses Diagram

The tool can estimate transport outcomes from land use and transport network input data through the following four stages:

Model Stage	Functionality	Specifications
Generation	Calculate total trips produced by population and attracted to the activities (e.g. employment) within individual geographical areas (i.e. zone) by trip purposes.	Trip purposes: • Home based work • Home based education • Home based other • Non-home based business • Non-home based other • Trucks (a separate mode but modelled separately due to its unique behaviour from all other modes).
Distribution:	Spread production and attraction trips within individual zones to production and attraction zone pair based on accessibility between the zones.	Generalised cost components (for accessibility): • Travel time by mode (based on shortest path distance and travel speed between the zonal pair) • Vehicle operating cost (fuel and fleet composition) • Parking cost • Public Transport (PT) fare and service frequency.
Mode Share:	Distribute trips by trip purposes across different modes.	Modes: • Car • PT • Walking • Cycling.
Assignment:	High-level origin and destination level allocation (from production/attraction to origin/destination). Link (road) level assignment is not undertaken in the SPT.	

2.1 Model Input Assumptions

The main model inputs are base (existing) and future land use and networks. This section describes the assumptions that were used to create base year inputs. Future year land use inputs and network interventions were provided by Whakatāne District Council (WDC) in the format consistent with that used in the base year. For more details on the input assumptions, please refer to **Appendix A** – Base Model Development and Calibration.

Land use information for the study area is modelled by zones as depicted in **Figure 1-1**. The zone boundaries were originally based on statistical area 2 (SA2) units defined by Statistics New Zealand, with refinements in development areas and geographically large zones.

Census 2018 information was used to create the base year land use information for each zone, which includes the following categories:

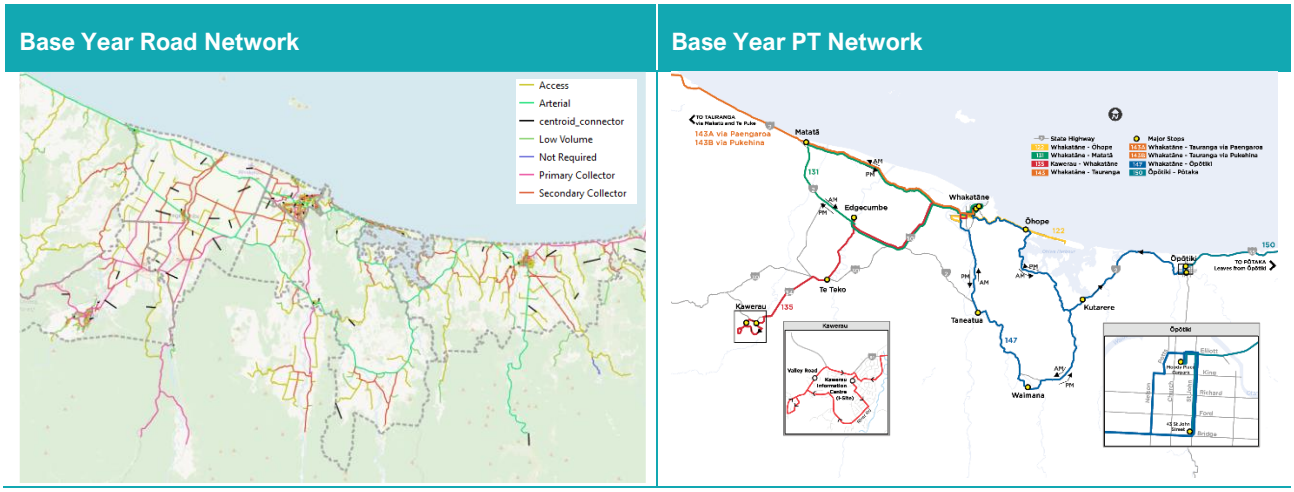
- Population and household
- Employment by industry type (agriculture, education, industry, retail and services)
- School by type (primary, secondary and tertiary).

New Zealand Transport Agency (NZTA) Traffic Monitoring System (TMS) traffic counts are used to derive the production and attraction of trips for external zones.

The ONRC (one network road classification) network from NZTA is used as the basis for the base year network input, with minor corrections to ensure connectivity (see Figure 2-2). Speed limit information from NZTA for the region is overlaid on the network and adjusted based on road classification to simulate operating speed. A shortest path algorithm is run between all origin and destination zone pairs on the network to derive distance, travel time and average speed information for:

- Car (with adjusted speed from posted speed information)
- Walk (with 5km/hr travelling speed)
- Cycle (with 15km/hr travelling speed)
- Public transport (same speed as car where there is a PT service with minimum service headway added onto the travel time, walking speed is assumed where there is not, see Figure 2-2). For education trips, due to lack of bus service information for school buses, it is assumed that the PT travel time is a function of car travel time (with additional walk time penalty to represent the first and last mile).

Figure 2-2: Road and PT Network



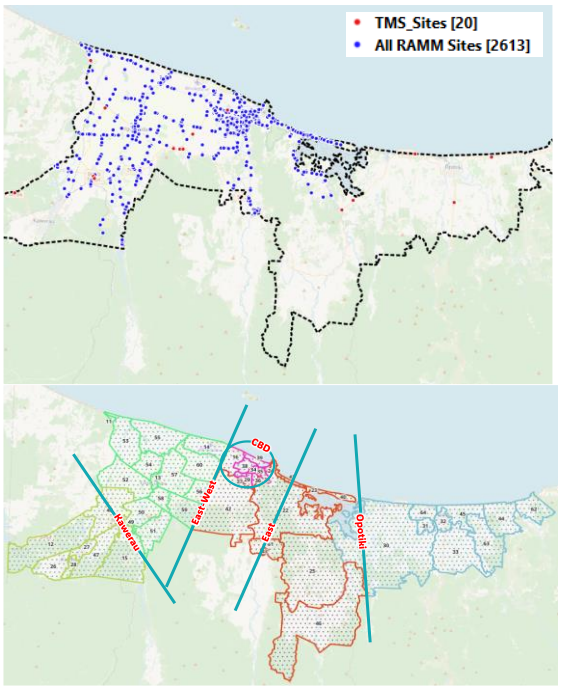
2.2 Base Model Calibration

The base year model is calibrated based on the following observed data:

- 2018 census journey to work and journey to education data
- RAMM and TMS traffic counts (AADT).

Using this information, relevant model parameters are tuned so that the model response for the following components is reflective of the observed data at a high-level:

- Traffic generation for home based work and home based education trips
- Model share for home based work and home based education trips
- Average trip length for home based work and home based education trips
- High level match in traffic counts across five screen lines (as shown in the map on the right).



In summary, the base year model is considered reflective of the actual conditions in 2018. Model outputs are summarised in **Appendix A** – Base Model Development and Calibration.

2.3 Future Scenario Assumptions

From the calibrated base year 2018 scenario, three land use scenarios prepared and provided by the EBOPSP team were tested, including:

- Future year 2048 – “Business as usual”
- Future year 2048 – “New town development”
- Future year 2048 – “Max infill development”.

For the New Town and Max Infill land use scenarios, four associated network intervention scenarios were created, these being:

- Network changes
- Policy changes – parking charges
- Policy changes – fuel price increase
- Network changes with all policy changes.

The Network changes include cycle facilities, public transport improvements and a new bridge access for traffic to the Whakatāne township. The new bridge is assumed to cross the Whakatāne River at the southern end of the town (see Figure 2-3). The bridge would connect to SH30 via Rewatu Road and Te Rahu Road. Cycle improvements include increased cycle networks within the township plus wider networks connecting townships. Public transport improvements refer to increased frequency of both urban and inter-urban bus services.

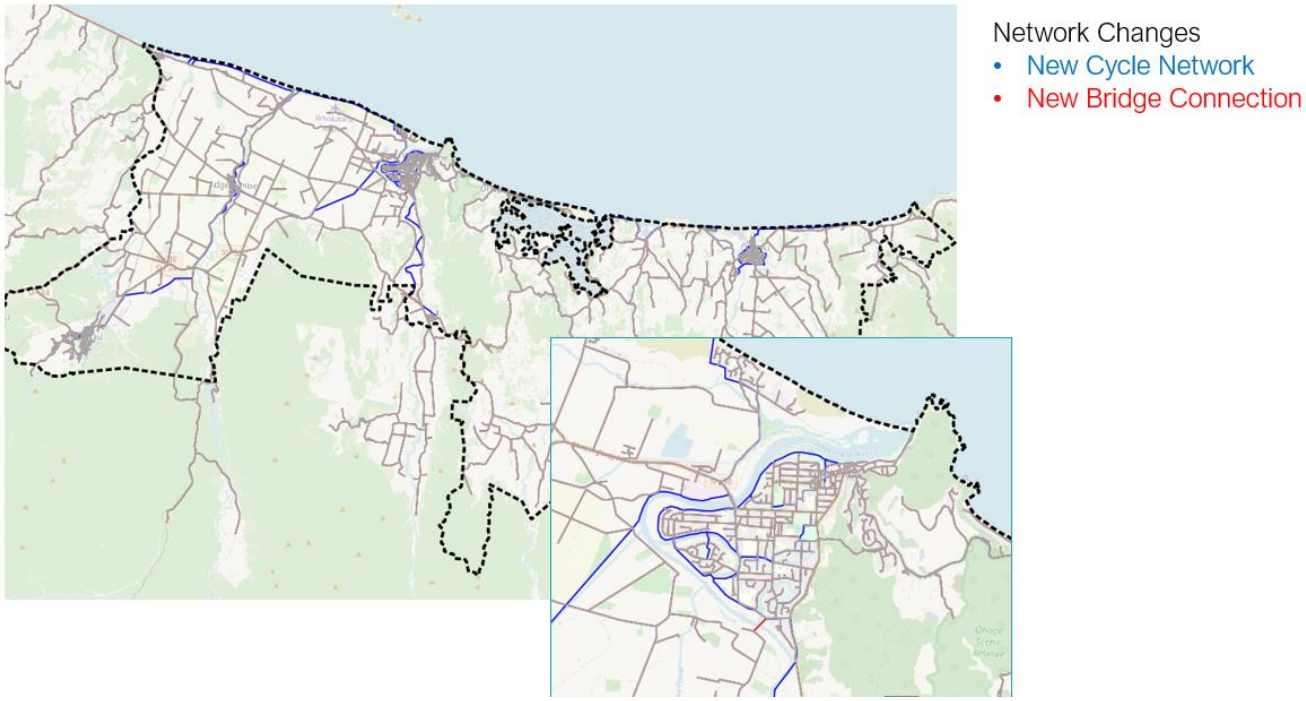


Figure 2-3. Network Changes including Cycle Network and Bridge Access

Details on the land use and network assumptions used for the future scenarios can be found in **Appendix B** – Future Year Scenarios.

3 Findings

Full model outputs are provided in **Appendix B**. Note that these are derived from comparing scenarios with the base business as usual or land use scenario without network intervention. While the estimates generated by the tool are quantitative and precise by nature (down to individual vehicle and person), the scenario results should be considered indicative, and relative to its reference case scenario).

A summary of key findings is provided in the following list:

- The total change in key metrics such as VKT and emissions is limited on a regional basis (maximum of 6.7% reduction in projected emissions). This is influenced by the level of change (population and job numbers and location) being a relatively small proportion of the existing total (approx. 75% of population and households do not change)
- Improvements to the network could see the most reduction in car mode share (from around 87% to 70%). This is largely due to the assumed widespread cycle network improvements, which result in the cycle mode share increase from about 3% to 21% (some of this is shifting walk trips to cycle but the largest shift is from car driving). This would improve efficiency and productivity of the network for vehicles that remain on road where congestion exists.
- Parking charges in the CBD would encourage more people to shift from cars to walking. With parking charges, the mode share for cars decreases by about 7%, while that for walk increases by 5%.
- Fuel price increase is not estimated to have a significant impact on the overall mode share, which is reflective of the assumption that the perceived vehicle operating cost (VOC) by the road users were lower than the actual VOC.
- The New Town scenarios generally result in higher VKT and emissions compared with Max Infill scenarios.

- When combined with all network improvements, the Max Infill scenario is estimated to have the lowest VKT and emissions, with about 7% lower total daily emission compared with the 2048 BAU scenario (most efficiency gains).
- With this lower mode share for car driving and higher uptake of active modes (walking and cycling), the Max Infill scenario is likely to achieve greater health benefits through more physical activity and less pollution / cleaner air. This assumes that new infrastructure is safe for use.
- Accessibility is best supported in the scenarios with network improvements such as cycleways, improved PT and the new bridge. The Max Infill scenario is likely to have better accessibility given most jobs and opportunities will continue to be located in the township. It is assumed the new town would offer schools, jobs and local services, but many people are still likely to need to travel to Whakatāne.

3.1 Round 2 Modelling Findings

Subsequent to discussion of the above findings with WDC, a second round of modelling was undertaken to examine two aspects of the outputs in more detail, these being:

- **Bridge Intervention**: an additional model run with only the bridge intervention to isolate its effects.
- **Mode Share Breakdown**: Add a breakout of mode share for trips to Whakatane CBD, Opotiki CBD, and Kawerau CBD. This will help us tailor considerations for each area.

Outputs from this round of modelling are provided in **Appendix C**. This modelling indicates:

- The new bridge takes some trips from the existing Whakatane Bridge and a smaller number from the Pekatahi Bridge. The greatest reduction in trips across the existing bridges occurs in the Max Infill + All Interventions scenario, which has a combination of the new bridge, parking policy and walk, cycle and PT intervention to reduce traffic volumes.
- The Bridge intervention alone does not change mode share, emissions or VKT.
- Mode share outputs for the town centre areas indicate that Opotiki has the highest proportion of walking and cycling trips, but volumes are much lower than Whakatane or Kawerau. Also the model is not refined in Opotiki (there is only one zone), so the results may not be accurate at this level.
- The New Town scenario reduces trips in all three existing towns.

4 Transport Planning Findings

In all future model scenarios, traffic volumes increase across the network as the number of households and population increases. The safety and resilience of the network was assessed for all scenarios to determine potential improvements to support increasing use of the network.

4.1 Safety

The safety assessment uses collective and personal risk metrics provided in Mega Maps Road to Zero Edition 2 by the NZTA as base data.

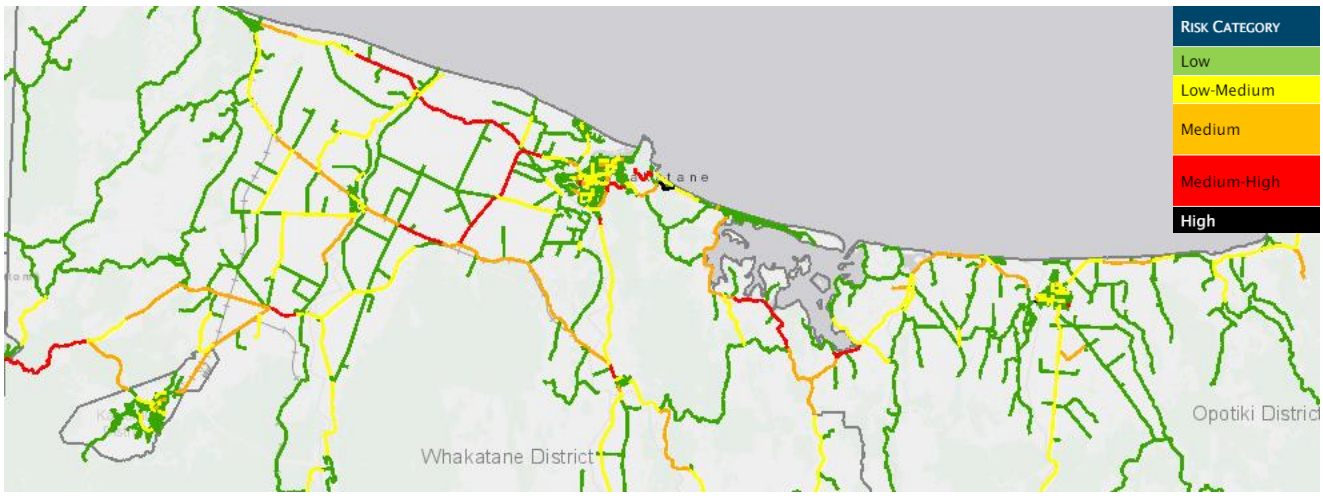


Figure 4-1 Mega Maps Collective Risk Extract Map (NZTA)

4.1.1 Assumptions

This section describes the key network and land use assumptions for the safety analysis:

- The transport model is a high level model and uses screen lines to define key movements in the Eastern Bay of Plenty. Key roads where screen lines are placed have been used to assume future volumes on the corridors assessed.
- The predicted change in traffic volumes across the screen lines is shown in Table 4-1 below.
- The Safe System Intervention Toolkit was used to give an indicative cost based on the level of intervention and length of treatment required.
- The highest collective risk sections were assessed for each corridor.

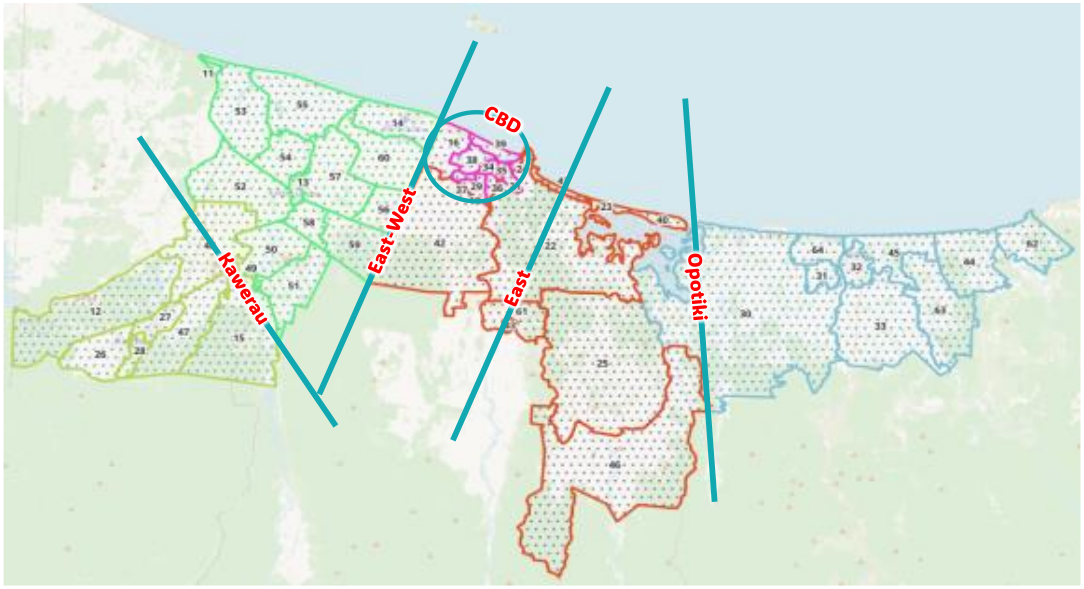


Figure 4-2. Vehicle Volume Screen Lines

Table 4-1 shows the predicted traffic volume increase from the base model under the various land use scenarios. Table 4-2 defines the scale of the volume increases within Table 4-2. The Whakatāne CBD screen line shows high growth centred around Whakatāne regardless of the land use scenario. The Ōpōtiki screen line has a low increase in traffic. The "New Town" land use scenario has a larger increase for the Whakatāne East-West screen line compared to the other land use scenarios.

Table 4-1 Volume Increases Though Screen Lines Compared to Base 2018 Model

Screen Line	Base 2048	New Town	Max Infill
Whakatāne East-West	High	Very High	High
Whakatāne East	Medium	Medium	Medium
Ōpōtiki	Low	Low	Low
Whakatāne CBD	Very High	Very High	Very High
Kawerau	Medium	Medium	Medium

Table 4-2 Volume Increase Scale

	Lower Limit (Vehicles per day)	Upper Limit (Vehicles per day)
Low	0	2999
Medium	3000	5999
High	6000	9999
Very High	10000+	

4.1.2 Findings

Table 4-2 defines a list of corridors and intersections where safety improvements could be necessary based on the current safety risk and future demands on the network under the EBOPSP scenarios.

The intervention list below is ranked based on the collective risk and future network volume. The corridors were assessed for all land use scenarios and found that the highest rank corridors remained the same as the vehicle volume increase do not change greatly between the scenarios as shown in Table 4-2. Indicative costs shown are rough order costs only and not cost estimates the actual cost will depend on design and site features etc.

Table 4-3. Ranked List of Road Corridors and Intersections Identified for Safety Improvement

Rank	Link / location	Collective Risk	Personal Risk	Safe System Treatment Philosophy 1.	Potential Treatment Category	Indicative Cost $<=5M	Spatial Plan Scenario
1.	Ohope Road	High	Medium High	Safe System Transformation	Road Side /Median barriers	$	All
2.	SH30/34 Intersection	High	Medium High	Safe System Transformation	Roundabout	$$	All
3.	SH2 (Kuatere to Ōpōtiki)	High	High	Safe System Transformation	Road Side /Median barriers	$	All
4.	Thornton Road	Medium High	Medium High	Safe System Transformation	Road Side /Median barriers, Intersection treatments	$$$$	All
5.	SH30 (North Awakeri to Whakatāne)	Medium High	Medium	Safer Corridors	Road Side /Median barriers, Intersection treatments	$$$$	New Town
6.	Tāneatua Road	Medium High	Medium High	Safe System Transformation	Road Side /Median barriers	$	All
7.	Valley Road	Medium High	Medium	Safer Corridors	Speed calming, Road side barriers	$	All
8.	SH2 (Matatā to Awakeri)	Medium High	Medium	Safer Corridors	Road Side Barriers	$	All
9.	SH30 (Rotoma to SH34 Te Teko)	Medium High	Medium High	Safe System Transformation	Road Side /Median barriers	$$	All
10.	SH30 (SH34 Te Teko to Awakeri)	Medium High	Medium	Safer Corridors	Road Side Barriers	$	All
11.	SH2 (Awakeri to Taneatau)	Medium High	Medium High	Safe System Transformation	Road Side /Median barriers	$	New Town
12.	Wainui Road	Medium High	High	Safe System Transformation	Road Side /Median barriers	$$	All
13.	SH2 (Tāneatua to Kutarere)	Medium High	Medium High	Safe System Transformation	Road Side /Median barriers	$	All

1. See link for definitions: https://www.nzta.govt.nz/assets/resources/standard-safety-intervention-toolkit/standard-safety-intervention-toolkit.pdf

4.2 Resilience

The transport resilience assessment was completed using a risk-based approach. Potential impacts to road corridors were assessed based on likelihood and consequence of closures across the network using the risk matrix in Table 4-3. The risks were assessed based on knowledge of the local area and the Bay of Plenty Regional Council Hazard identification maps (Bay Hazards). The projected change in traffic volumes from the SPT also informed this analysis.

Table 4-4. Risk Matrix

			Consequence				
			Insignificant	Minor	Moderate	Major	Severe
			1	2	3	4	5
Likelihood	Almost Certain	5	Medium	Medium	High	Critical	Critical
	Likely	4	Medium	Medium	High	High	Critical
	Possible	3	Low	Medium	Medium	High	High
	Unlikely	2	Low	Low	Medium	Medium	High
	Rare	1	Low	Low	Low	Medium	Medium

4.2.1 Findings

Table 4-4 defines the risks associated with the key transport network corridors in the EBOP. These risks affect all land use scenarios as there is no area not affected by the risk of natural hazards. There are a variety of natural hazards identified with flooding being the key risk due to the potential to restrict or eliminate access to key urban areas such as Whakatāne.

Table 4-5. Natural Hazard Risks for the Transport Network in the Eastern Bay of Plenty

Resilience Risk	Indicative Risk	Likelihood	Consequence	Risk	Score	Key affected corridors / areas
Flooding - Whakatāne / Kawerau	Key rivers and streams	Possible	Major	High	12	Bridges crossing the Tarawera, Rangitaiki and Whakatāne River
Flooding - Ōpōtiki	Key rivers and streams	Possible	Major	High	12	Bridges crossing the Waioeka and Otara River
Landslide	There are some key road corridors with risk of landslides	Possible	Major	High	12	SH2 Waimana Gorge / SH2 Waiotahe, Ohope Road /Wainui Road
Volcanic eruption - Whakaari/White Island	Most hazards localised to the Island, Minor ash fall on Mainland and possible tsunami	Likely	Minor	Medium	8	Whakatāne areas affected by ash fall on roads
Sea Level Rise / King Tides	Inundation in coastal areas affecting some residential areas	Possible	minor	Medium	6	Costal erosion on roads near coast including Wainui Road
Tsunami EBOP Wide	Inundation in coastal areas and critical infrastructure including bridge	Rare	Severe	Medium	5	Bridges/ roads on coastal areas (SH30 and SH2) including access to Whakatāne
Earthquake EBOP wide	There are multiple fault	Rare	Severe	Medium	5	All areas mainly affecting key bridges, landslip risks areas

	line recorded in the EBOP.					
Volcanic eruption - Pūtauaki/Mt Edgecumbe	Localised Pyroclastic flows and other hazards[1.]	Rare	Severe	Medium	5	Kawerau could be cut off by Pyroclastic flows and area affected with ash
Volcanic eruption - Okataina Volcanic Centre	Ashfall and pyroclastic flows and lake break out floods[1.]	Rare	Severe	Medium	5	Flooding from lake break out could affect bridges and roads along the Tarawera River. and ashfall affect other key routes into the EBOP
Liquefaction	There are large areas where liquefaction is possible in residential areas[1.]	Rare	Major	Medium	4	Whakatāne, Awakeri, Edgecumbe, Kawerau, and Ōpōtiki. Minor effects to roads potential to destabilise old bridges

1. Extracted from Bay of Plenty Regional Volcanic Hazards Scoping Study 2023, Bay of Plenty Regional Council

5 Programme of Interventions

5.1 Programme of Interventions for Consideration

The safety projects and resilience risk areas identified above, along with potential transport interventions tested in the SPT, have informed development of a proposed improvement programme to compliment the spatial plan land use changes. The programme consists of corridor, network and policy interventions.

The following table provides a draft programme of interventions that could be considered as part of the EBOPSP project to improve safety, resilience and contribute toward the outputs predicted in the SPT (trips, mode shift etc).

Indicative costs are rough order costs only and not cost estimates, the actual cost will depend on design and site features etc. Where applicable related existing programmes from the State Highway Investment Proposal (NZTA) and Long Term Plan (WDC) have been identified along with a potential way forward for Council team consideration.

Table 5-1. Potential Transport Improvements Programme

Corridor	Improvement Type	Potential Treatment Category	Indicative Cost $=5M	Spatial Plan Scenario	Alignment with Planned Projects (LTP, SHIP)	Potential Way Forward
Whakatāne Eastern (Ohope and Wainui Road)	Safe System Transformation	Roadside / Median Barriers	$$	All		Detailed Business Case
SH30 (Rotoma to Awakeri including SH30/34 Intersection)	Safe System Transformation	Roadside / Median Barriers / Roundabout	$$$$	All		Detailed Business Case
SH2 (Awakeri to Ōpōtiki)	Safe System Transformation and Resilience	Roadside / Median Barriers / Roundabout, Landslide protection, Coastal erosion protection	$$$$+	All	• SH2 Awakeri to Ōpōtiki Resilience (SHIP) • SH2 Wainui Road to Ōpōtiki, NSRRP (SHIP)	Programme Business Case
Thornton Road	Safe System Transformation and Resilience	Roadside / Median Barriers, Intersection treatments, Improved drainage	$$$$	All	• Thornton Road – Blueberry Curves – safety improvements (WDC LTP) • Network wide Resilience (WDC LTP)	Programme Business Case
SH30 (North Awakeri to Whakatāne)	Safer Corridors	Roadside / Median Barriers, Intersection treatments	$$$$	New Town	• SH30 Awakeri to Whakatane (SHIP) • Shaw Road – Mill Road RAB Connection (WDC LTP)	Detailed Business Case
Whakatāne Southern Link	Safe System Transformation	Roadside / Median Barriers, Speed calming	$	All		Detailed Business Case
SH2 (Matatā to Awakeri)	Safer Corridors	Roadside Barriers	$$	All		Detailed Business Case
Waioeka Gorge Resilience	Resilience Improvements	Landslide / erosion protection	$$$$	All	• SH2 Waioeka Gorge Business Case (SHIP)	Single Stage Business Case
Whakatāne - Additional River Crossing	Resilience and Accessibility Improvements	New bridge connecting to Arawa Road and Rewatu Road	$$$$	All	Additional River Crossing IBC/DBC (WDC LTP)	Indicative Business Case
Public Transport and Cycling Improvements (as defined in SPT input)	Urban Network improvements	Increase frequency both in Whakatāne and the wider region	$$$	All		Programme Business Case
Parking Pricing	Policy Improvements	Implementing paid parking to existing parking in Whakatāne	<$	All		Parking Strategy / Plan

5.2 Transport Economics

Economic evaluation of the spatial plan and associated programme can only be considered robustly once more detailed cost estimates and timeframes are confirmed. Indicatively the max infill scenario may provide greater economic benefit (in terms of transport), as a result of lowering VKT and enabling improvements to travel time and vehicle operating cost, as well as delivering benefits associated with higher cycle use (health benefits), public transport user benefits and emission reduction benefits.

The economic benefit of the associated programme would need to be determined through the business case stage. Depending on the cost of implementation, the programme should deliver a positive economic return from a reduction in crashes (lives and serious injury reduction), and reduction in delay / risk of road closure via the resilience improvements. The business case process should help to ensure that the actual programme delivered provides benefits that exceed the cost over 40 years.

Generally the spatial plan delivered with associated transport improvements over time should return positive monetised and non monetised transport benefits, assuming implementation costs are reasonable.

6 Conclusion

A sketch planning tool was developed to estimate comparative outocmes between different long term land use scenarios proposed for the EBOPSP. The tool indicates small differances between the scenarios in terms of daily trips and emissions. Transport interventions help to reduce traffic volumes which will make the network more efficienct in places where congestion / delay may occur by reducing demands.

This transport assessment also considers safety and resilience of the network taking account of projected change in traffic volumes under the EBOPSP scenarios. A number of safety and resiliance projects were identified with indicative rough order cost levels. These projects aim to mitigate road safety and resiliance risks and support the outcomes indicated by the SPT and could be considered further for inclusion by the EBOPSP team.

A

Appendix A – Base Model Development and Calibration

Eastern Bay of Plenty Sketch Planning Tool

Model Development and Initial Results

April 2024

make everyday better.

Agenda

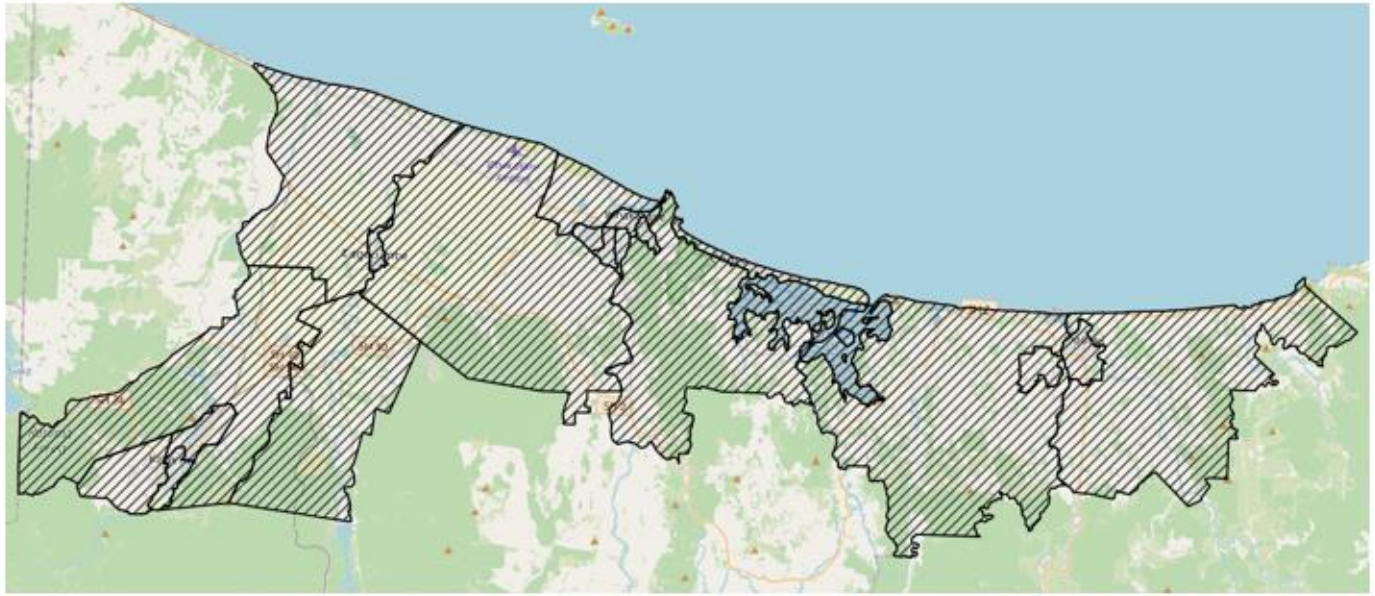
- Tool Structure and Setup
- Tool Calibration and Base Year Results
- Future Scenarios
- Next Steps – questions on network interventions

Tool Purpose

From Offer of Service:

The focus of the tool would be on comparative measures between different long term land use scenarios, at a sector-to-sector level (preferably at Statistical Area 2 spatial unit level – noting this may need some adaptation in the region), rather than detailed prediction of individual link movements (this is not a detailed transport modelling exercise). We propose to use the tool specifically for the Whakatane / Opotiki area as depicted in the image below. This is because we understand most of the land use changes will be within these areas and extending the tool would require more time and effort than beneficial.

Geographic scope of model



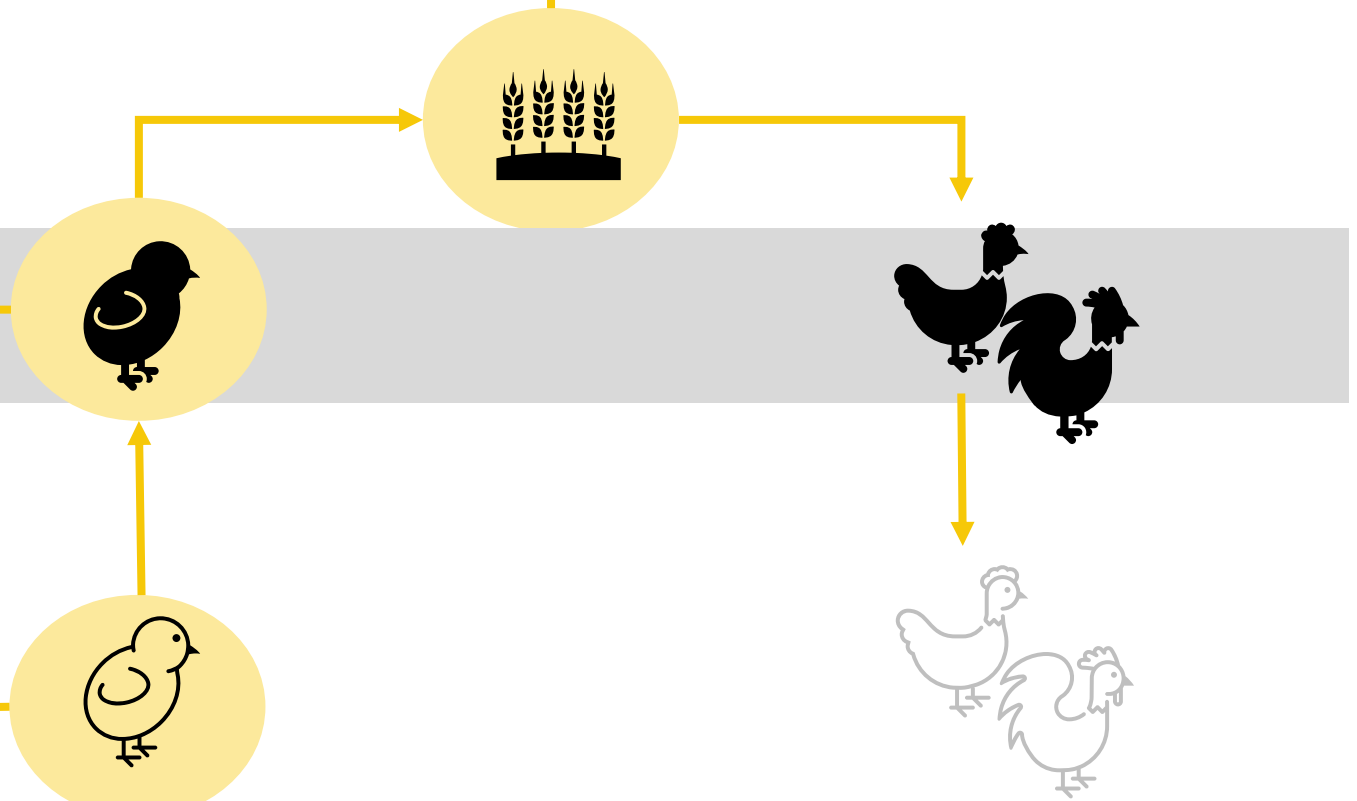
The scope is dependent on the data availability and scenario specifications. There are opportunities for the tool to be enhanced in future to include extra functionalities and precision for other analysis. For example, the granularity of the spatial representation for the tool would be determined post discussion with the client, after gathering more details on the scenarios to be tested. It is understood that SA2 spatial unit is too coarse for Whakatāne, additional exploration work would be conducted, looking at data available to support refining the zones.

Modelling Process

How to create scenario inputs?

How do we tune the base model?

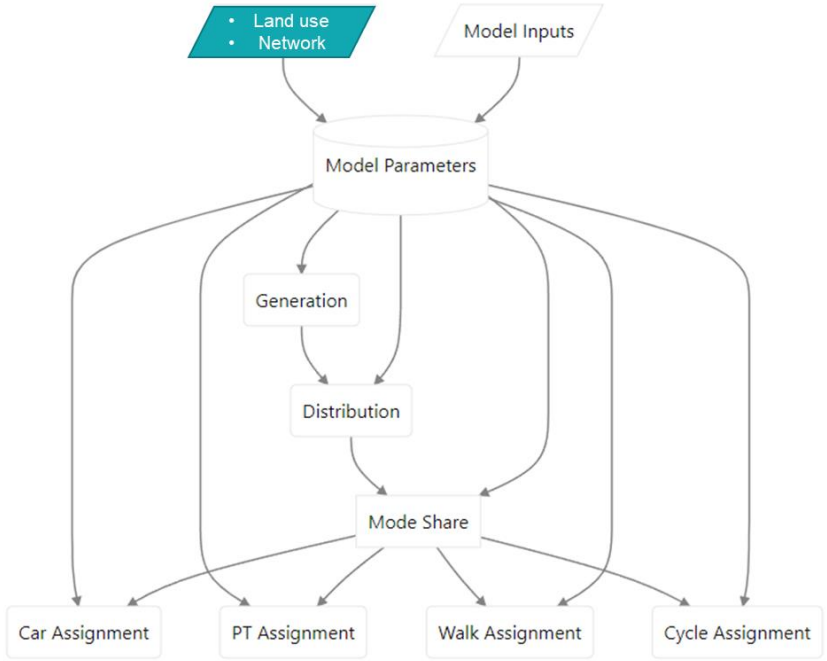
How do we structure the base model?
- Inputs
- Responses



Base

Scenario

Tool Structure



Outputs (including VKT and emission)

Trip Purposes

- Home based work
- Home based education
- Home based other
- Non-home based business
- Non-home based other
- Trucks

Modes

- Car
- Public Transport (PT)
- Walk
- Cycle

Trip Generation

Production = Trip Rate * Production Land Use
Attraction = Trip Rate * Attraction Land Use

Trip Distribution

Doubly-constrained gravity distribution model, based on generalised cost by trip purpose across all modes. Generalised cost (GC) is a function of:

- Travel time
- Travel cost (fuel, parking and fares)
- Mode specific constant (MSC)

Mode Share

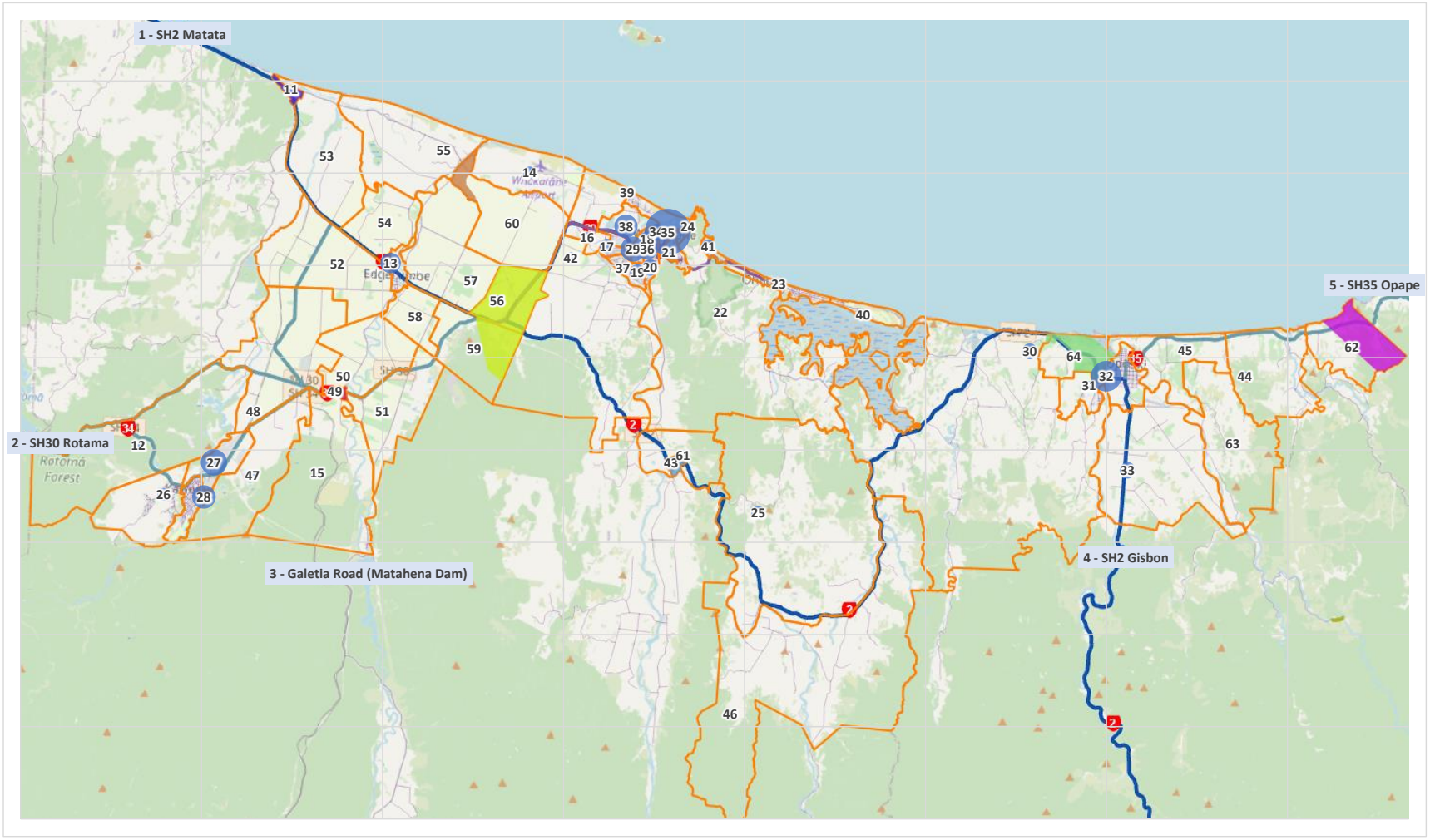
Logit choice model, based on mode specific GC over composite GC by trip purpose

Input Assumptions – Land Use

Zones
- 5 External
- 54 Internals

Internal Zones (54) – Census Land Use
- Population and Household
- Employment by Industry Type:
  - Agriculture
  - Education
  - Industry
  - Retail
  - Service
- School by Type:
  - Primary
  - Secondary
  - Tertiary

External Zones (5) – TMS counts



Input Assumptions – Network

Network

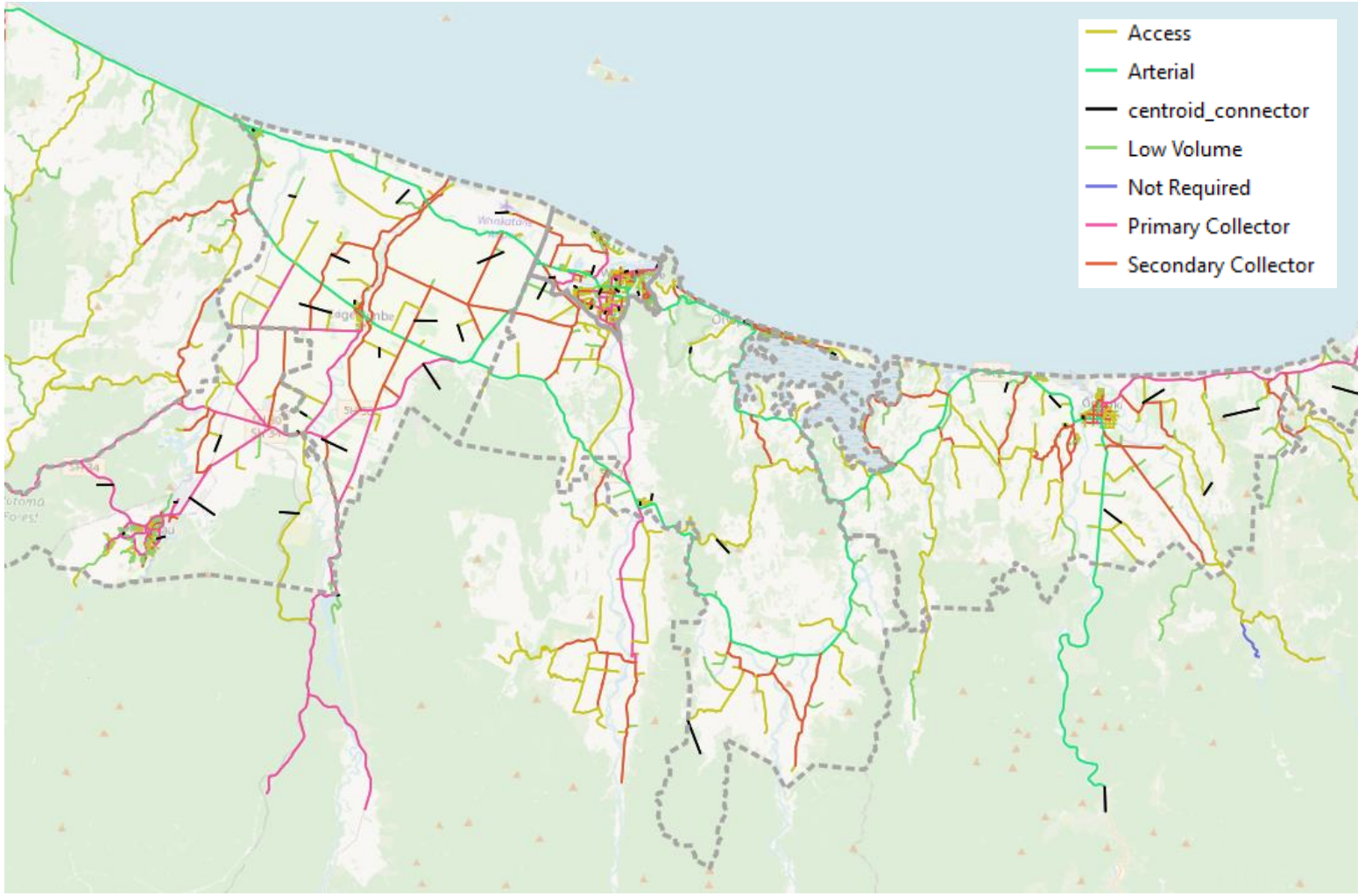
- Car travel time and distance
- Walk travel time and distance
- Cycle travel time and distance

Skimmed, based on shortest path from ONRC network;

Speed limit adjusted to better reflect travel time at a high-level;

Land use loading points in zones based on centroid location;

Minor changes made where there are missing connections.



Input Assumptions – Network

Network

- Car travel time and distance
- Walk travel time and distance
- Cycle travel time and distance
- PT travel time (incl. headway) and distance
- PT fare

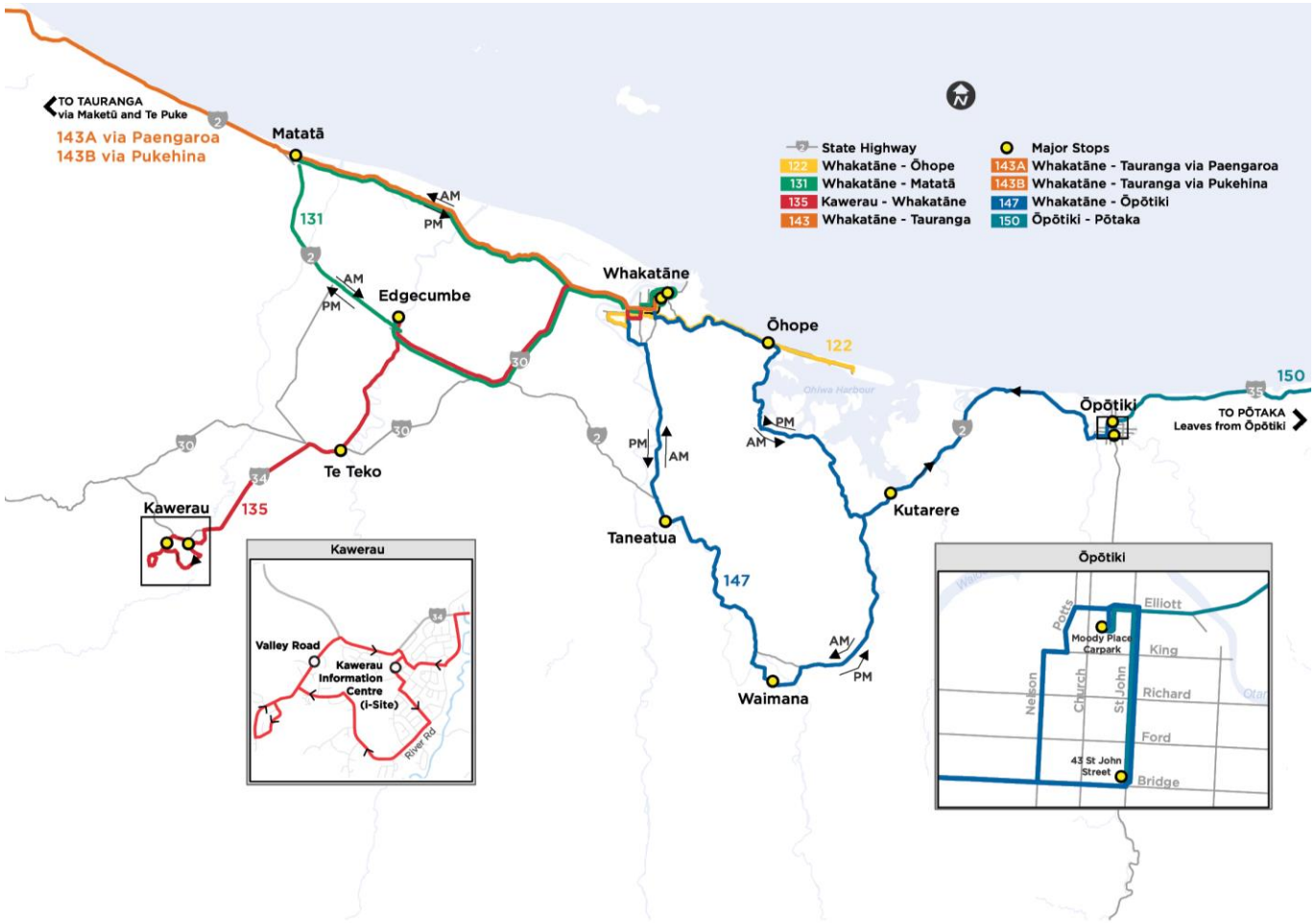
PT headway assumption on roads where bus is available;

If no bus available, walking speed is assumed;

For education trips, due to lack of bus service information for school buses, it is assumed that the PT travel time is a function of car travel time (with additional walk time penalty to represent the last mile);

PT fare (from BayBus website) is applied on origin and destination zone pair level.

No parking charges are assumed in the base year.



Tool Calibration and Base Year Results

- Observed data
- Trip Generation
- Trip Distribution
- Mode Share
- Trip Length
- Screenline Counts Comparison

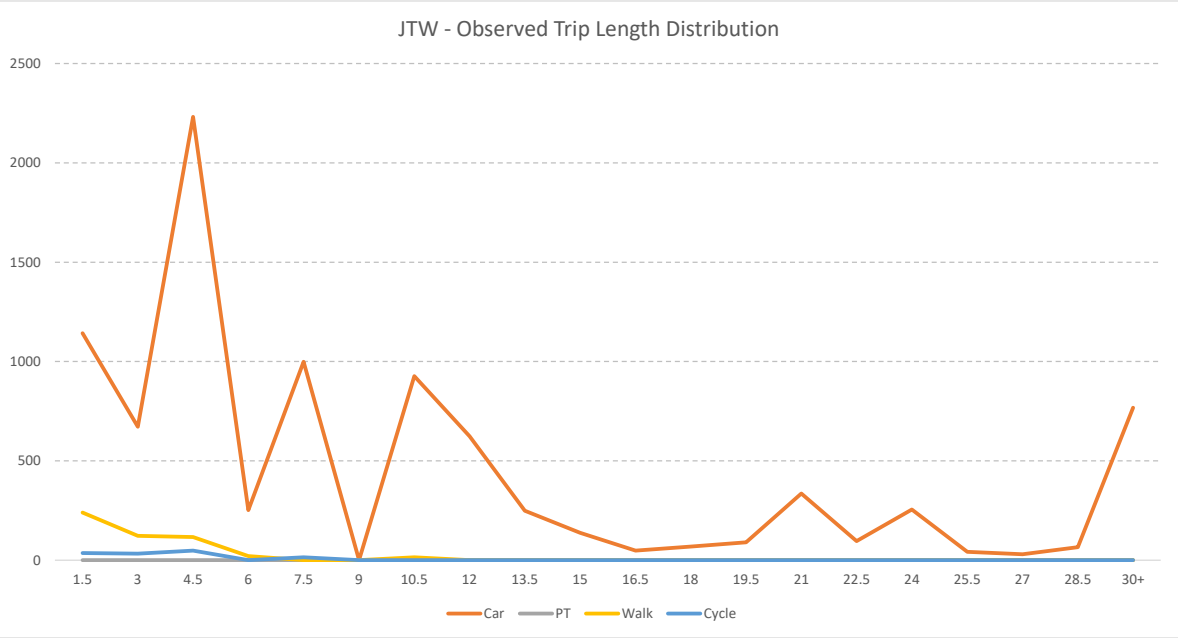
Observed Data

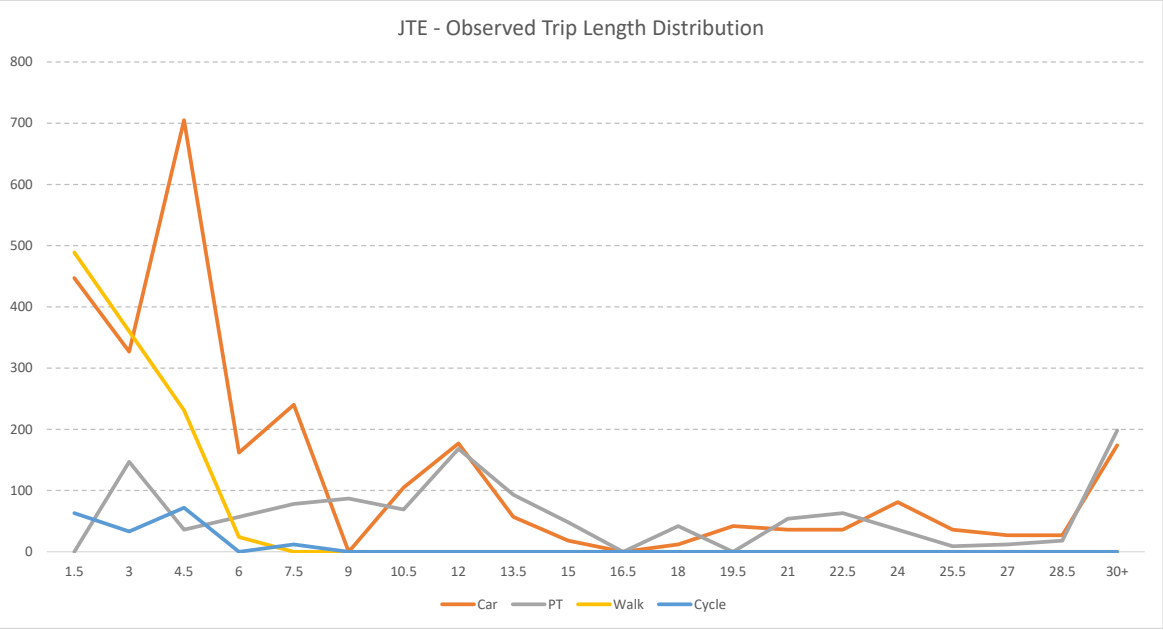
Census Journey to Work and Journey to Education

- Production: SA2 summary of main means of travel to work/education by usual residence address for census usually resident population count
- Attraction: SA2 summary of main means of travel to work/education by workplace/education institution address for census usually resident population count
- Origin-Destination: From SA2 usual residence address to SA2 workplace/education institution address for census usually resident population

Observed Data

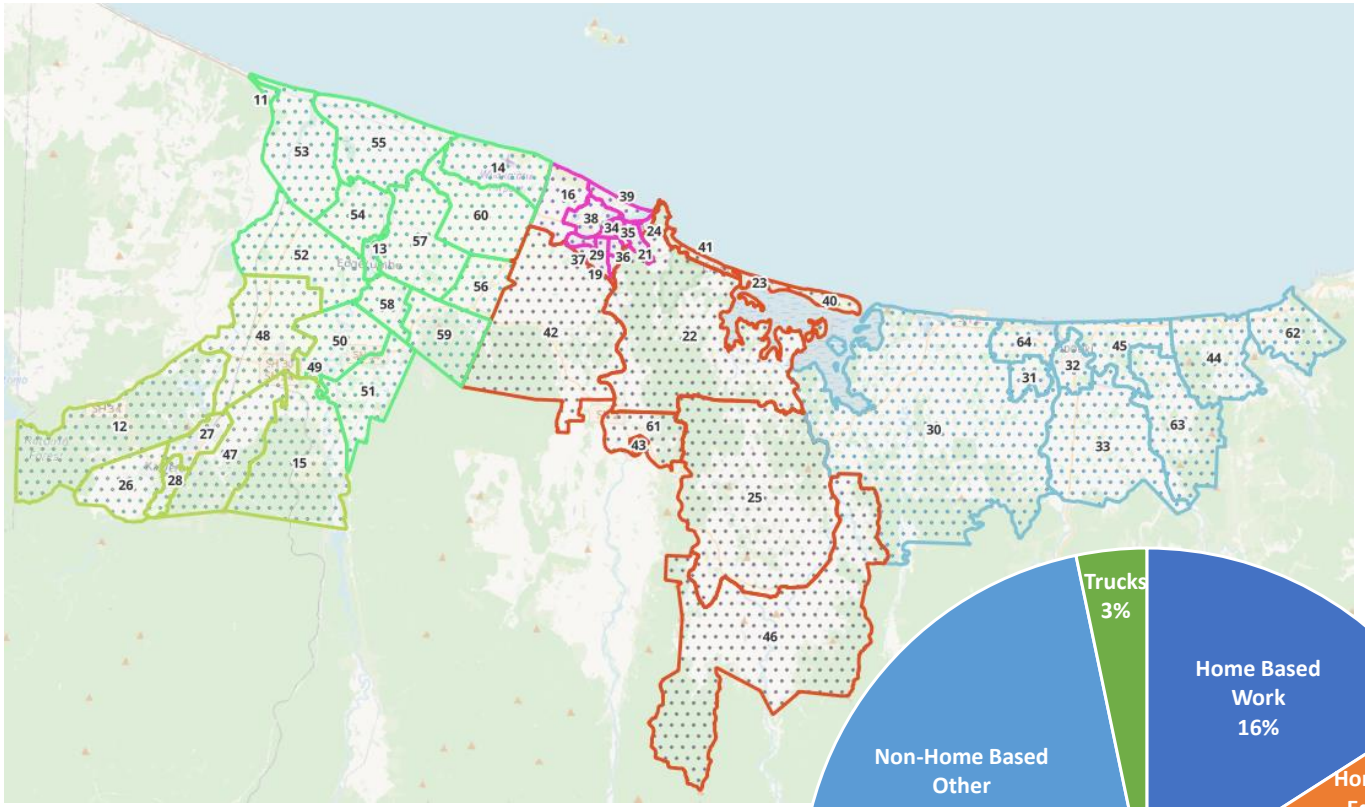
Census (with District Adjustment)	Car	PT	Walk	Cycle	Total
Observed HBW	31,702	50	1,902	720	34,373
Observed HBE	10,585	4,655	4,117	670	20,026

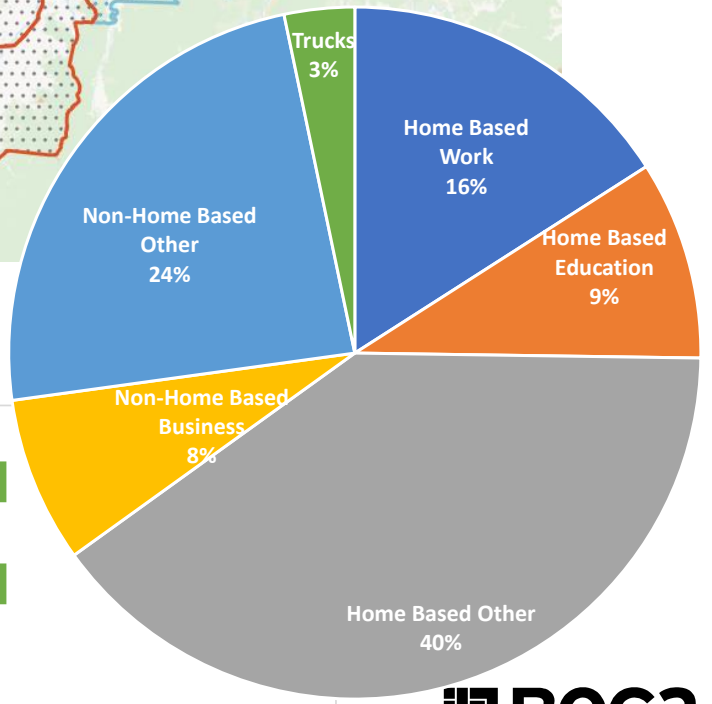


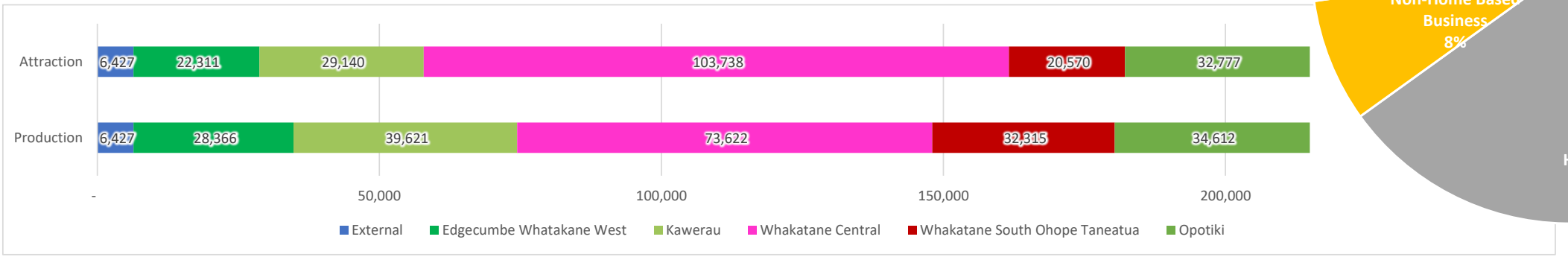


Trip Generation

- Daily person trips by trip purpose produced by and attracted to individual zones
- Overall home based work and home based education trips from internal zones to match census journey to work (~34k) / education (~20k) total for EBoP





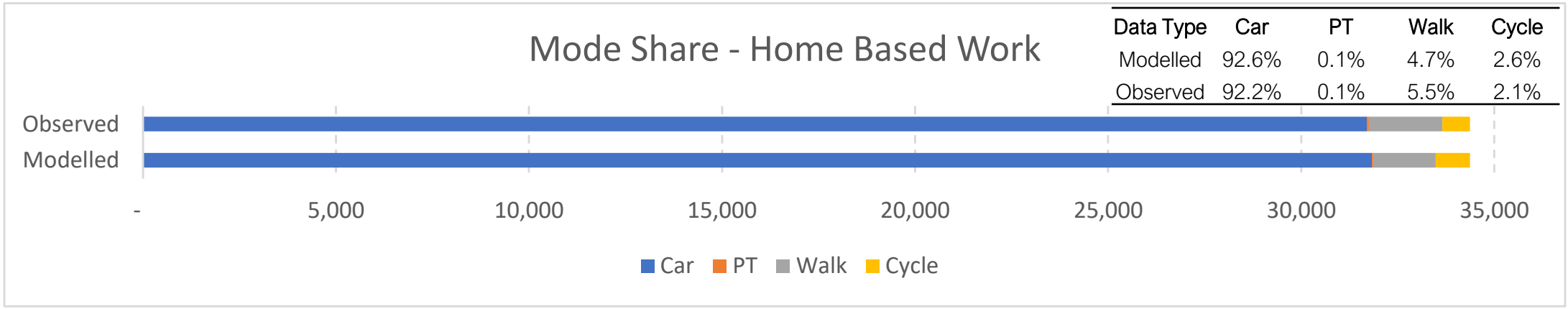


Trip Distribution

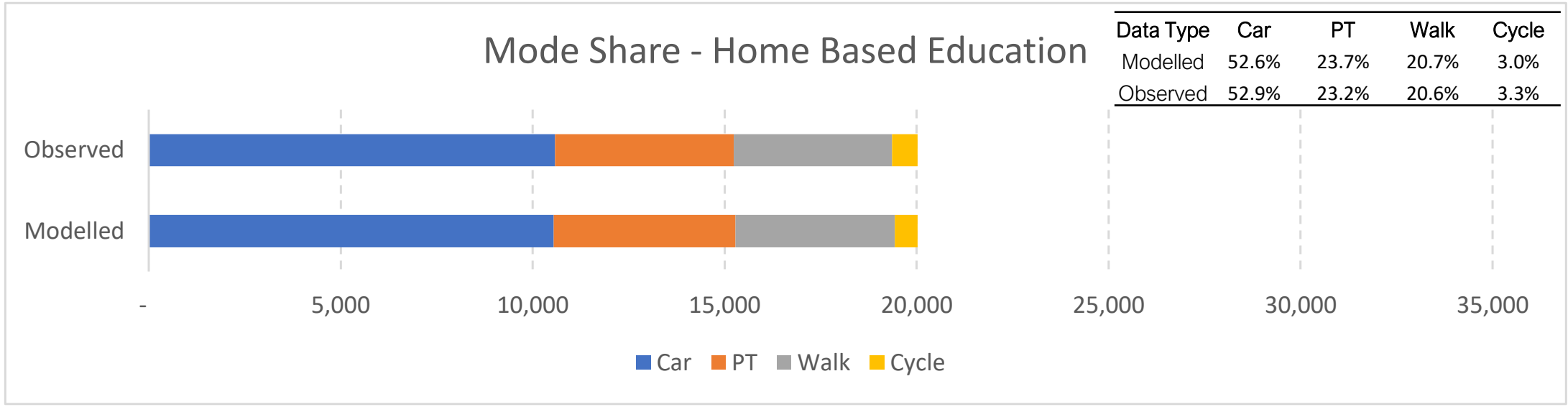
- Daily person trips by trip purpose between individual zones.

	Edgecumbe Whakatane West	Kawerau	Whakatane Central	Whakatane South Ohope Taneatua	Opotiki	Total
Edgecumbe Whakatane West	11,666	2,380	8,683	1,352	7	24,087
Kawerau	4,674	26,123	2,549	431	3	33,780
Whakatane Central	3,319	246	76,689	5,944	30	86,227
Whakatane South Ohope Taneatua	1,263	110	14,489	11,463	402	27,726
Opotiki	32	3	351	1,104	31,345	32,836
Total	20,953	28,862	102,760	20,294	31,787	204,657

Mode Share



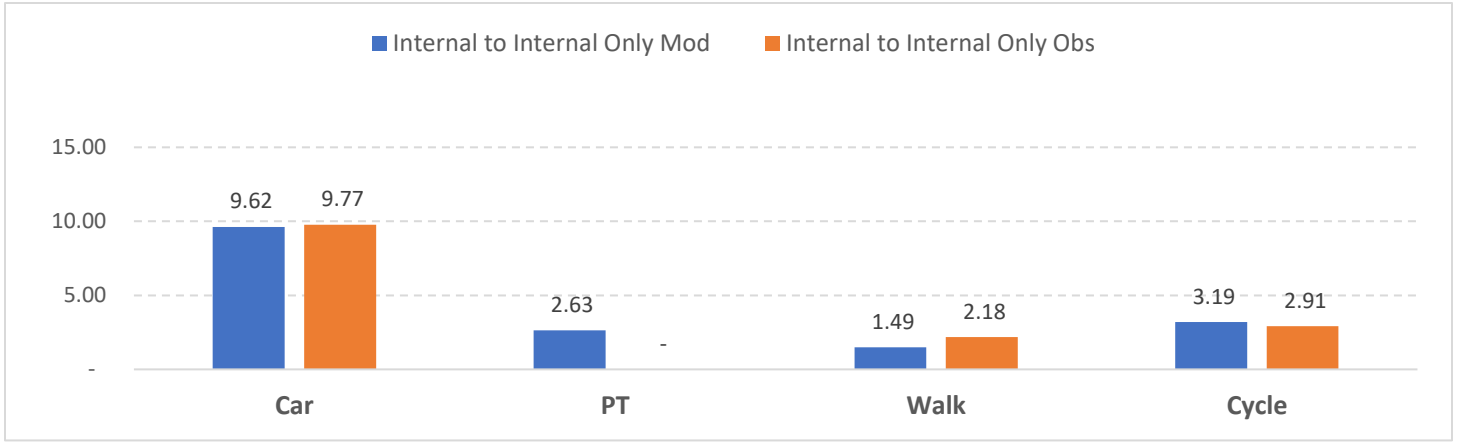
Data Type	Car	PT	Walk	Cycle
Modelled	92.6%	0.1%	4.7%	2.6%
Observed	92.2%	0.1%	5.5%	2.1%

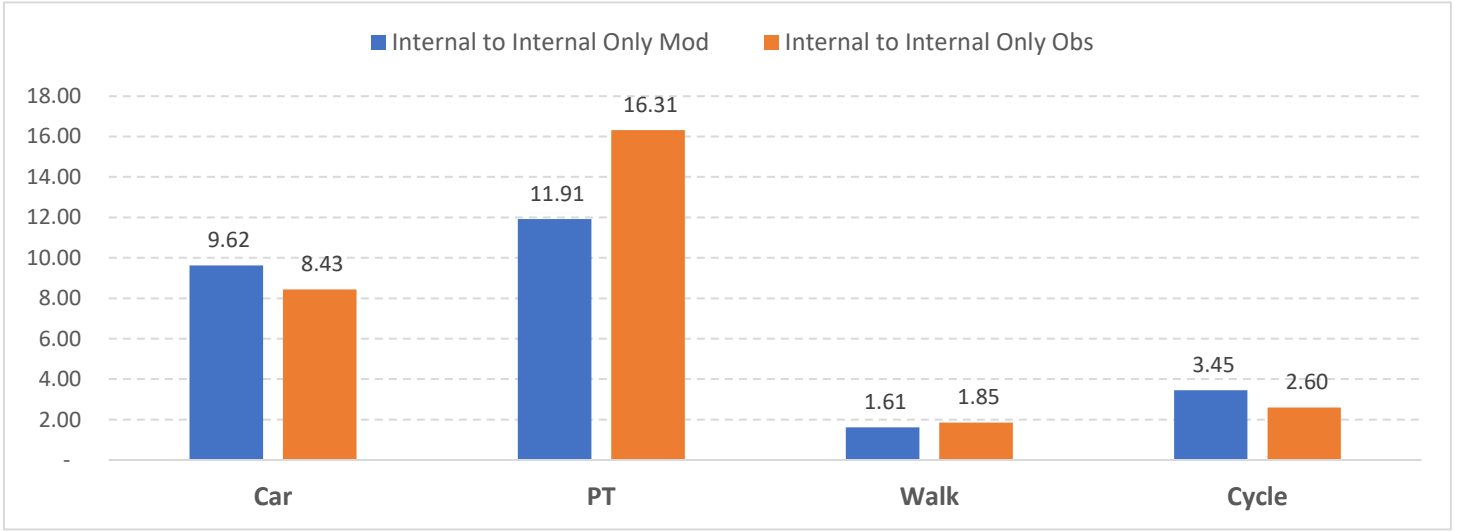


Data Type	Car	PT	Walk	Cycle
Modelled	52.6%	23.7%	20.7%	3.0%
Observed	52.9%	23.2%	20.6%	3.3%

Trip Length

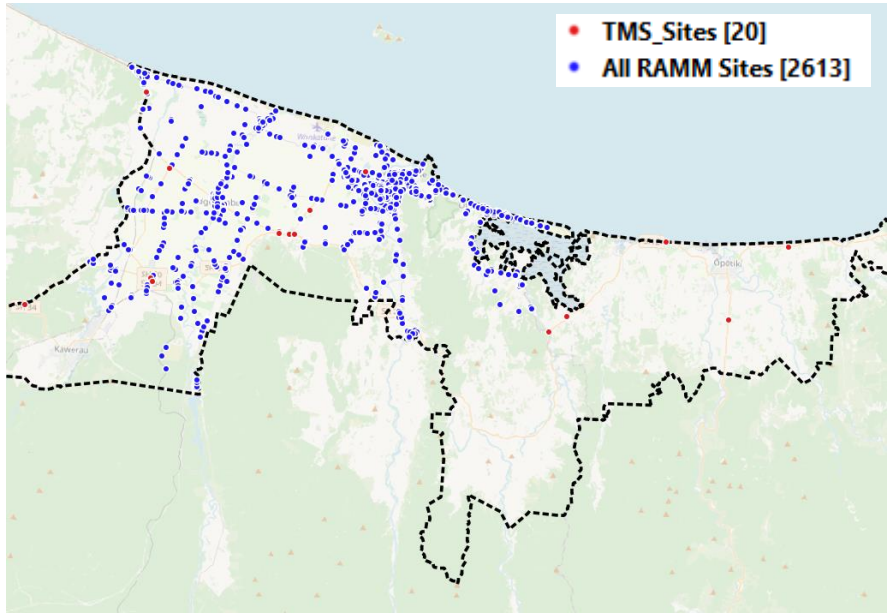
- Significant data loss due to census rounding;
- No PT trips was observed at OD level in the observed for JTW;
- Modelled trip length matched quite well with observed, except for JTE PT.

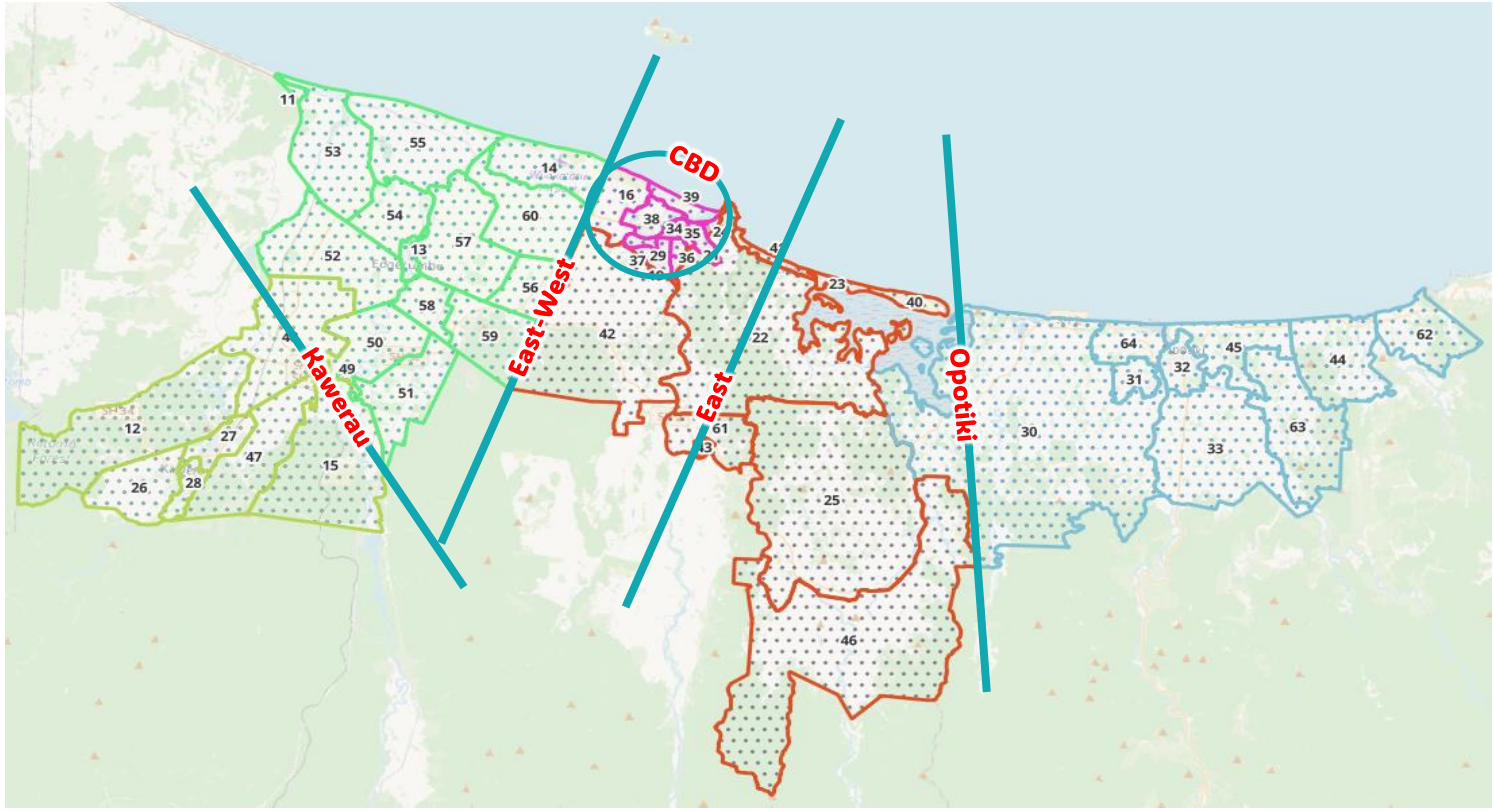




High Level Screenline Comparison

- From 2500+ RAMM and 20 TMS count sites, formed 5 screenlines
- Model weak on route choice when there are multiple alternatives, but validated well at screenline level





Car + HCV	% inter-sector
East-West	35%
Opotiki	14%
CBD	36%
Kawerau	35%

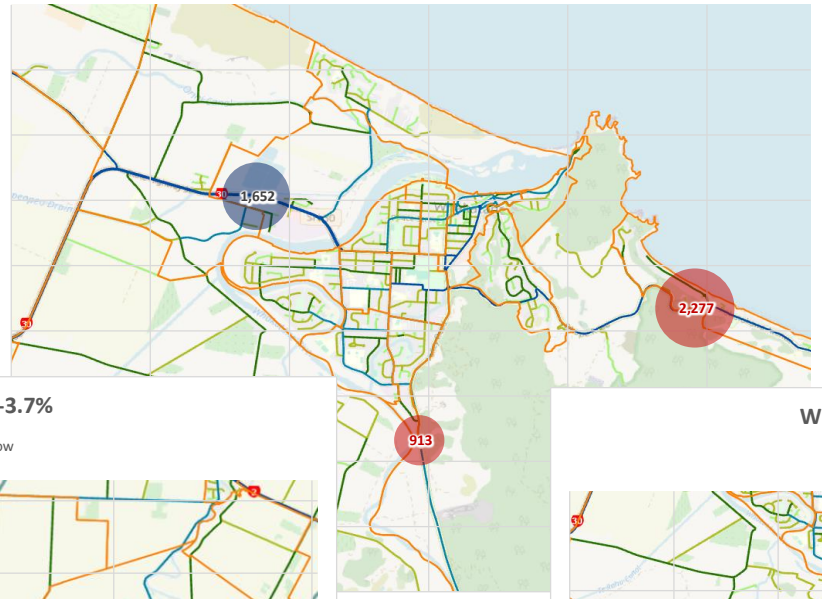
Car + HCV	CBD	East	Opotiki	Kawerau
Screenline Difference (Modelled / Observed - 1)	**5%**	**13%**	**-24%**	**-4%**

Beca

High Level Screenline Comparison

Whakatane CBD screenline: +5.4%

Model High Model Low

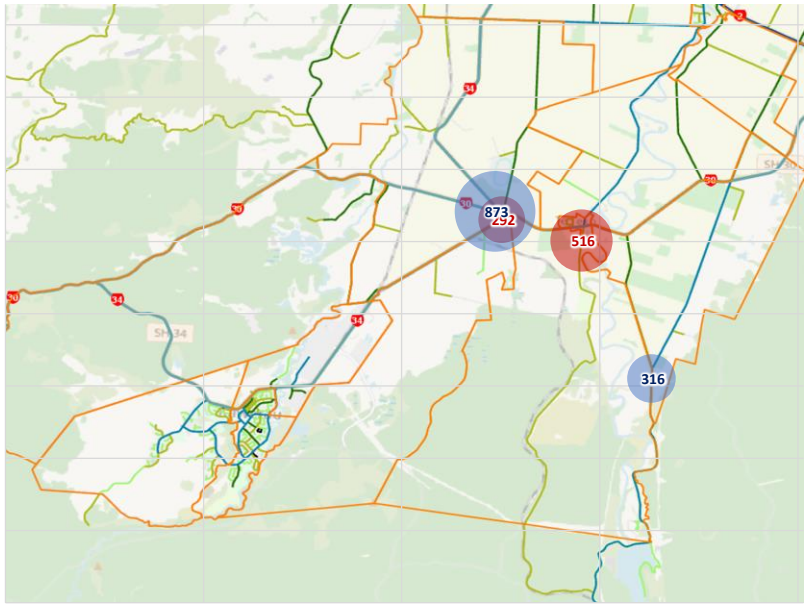


Whakatane Opotiki screenline: -24.1%

Model High Model Low

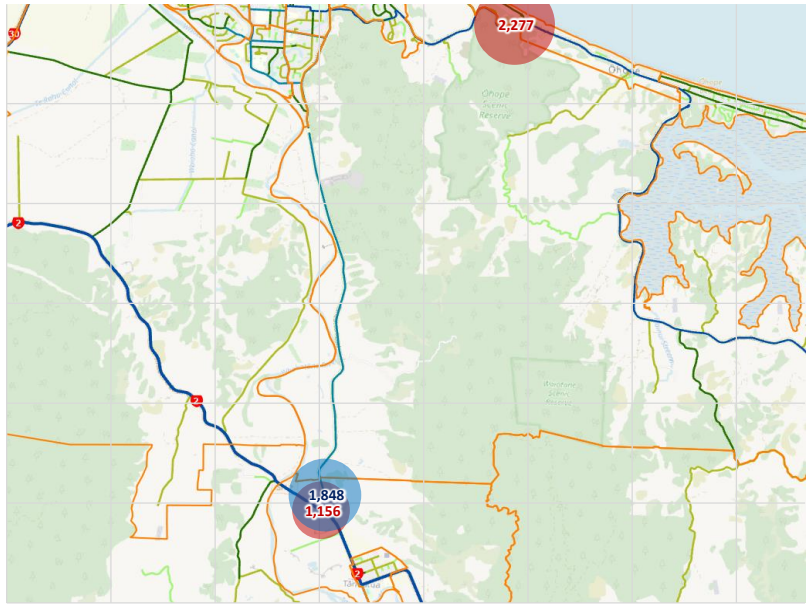
Kawerau screenline: -3.7%

Model High Model Low



Whakatane east screenline: 13.0%

Model High Model Low



Scenario Building

Land Use Assumptions

Scenario	Population	Household	Total Emp	Agricultur	Education	Industry	Retail	Service	Primary	Secondary	Tertiary
Base 2018	45,207	15,863	14,841	1,969	1,452	3,414	2,435	5,571	5,357	3,000	1,733
		2.85	33%	13%	10%	23%	16%	38%	12%	7%	4%
Base 2048	56,071	20,910	21,105	2,354	1,754	5,309	3,603	8,085	6,644	3,721	2,150
	124%	2.68	38%	11%	8%	25%	17%	38%	12%	7%	4%
New town	56,071	20,910	21,105	2,354	1,754	5,309	3,603	8,085	6,644	3,721	2,150
	124%	2.68	38%	11%	8%	25%	17%	38%	12%	7%	4%
Max infill	56,071	20,910	21,105	2,354	1,754	5,309	3,603	8,085	6,644	3,721	2,150
	124%	2.68	38%	11%	8%	25%	17%	38%	12%	7%	4%

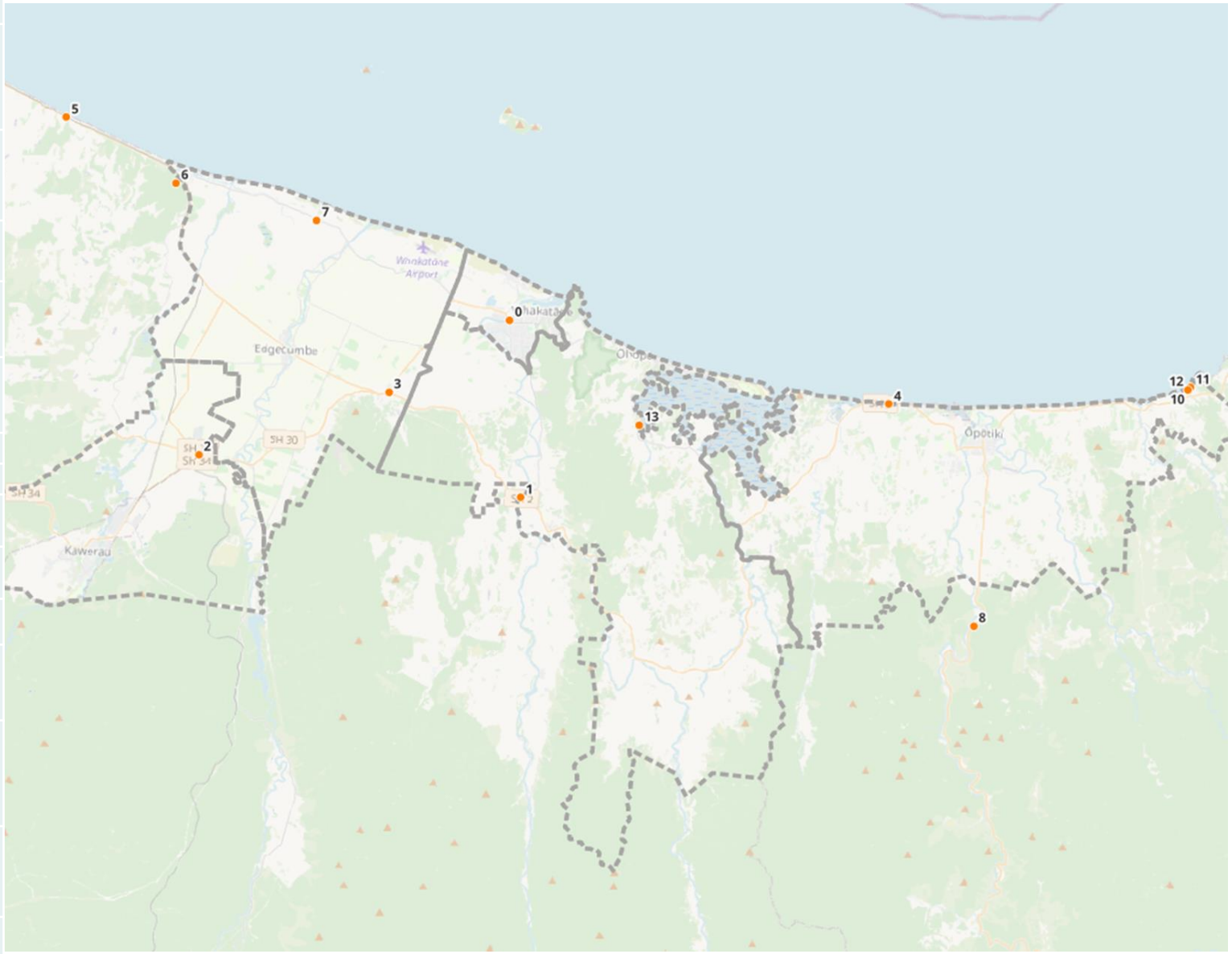
- Increased population and households (by 1%) for Base 2048 scenario, so they match with the other future year scenarios.
- Uplifted all future year scenarios to include growth between 2018 and 2022 – 3% growth in population, 4% growth in households and 10% growth in employment.
- Uplifted all future year scenario school rolls so participation rate remain consistent with base (participation rate for primary 12%, secondary 7% and tertiary 4%)

Network Constraints – links provided

ID	Project Name
0	Whakatane Arterial Capacity has reached or is close to reaching capacity during peak periods. There is peak spreading occuring which mitigates this impact somewhat however additional traffic demands will see a exponential increase in delays experienced.
1	Capacity constraints likely to occur with existing planned development. These will be concentrated at the intersection of SH30/Keepa Rd
2	Thornton Road is low lying and likely to be subject to flooding and sea level inundation into the future due to the effects of climate change.
3	landslide risk, closures and no suitable detour
4	All of SH2 Mainteneinace is below standard
5	SH34 Maintenaince below standard
6	Flooding issues
7	Road layout contributes to a hige and growing number of crashes. The unprotected shared use path creates a high risk of injury/fatality for users.
8	Preferred detour route requires upgrade due to slips etc on SH2
9	SH2 Flood and inundation risk increasing due to climate change
10	Existing Safety Issues Exaserpated by increasing traffic volumes
11	SH30 Corridor Safety. High existing collective risk with increasing crash history.
12	Severance issues in Taneatua accross SH30
13	Severance issues crossing SH2 in Edgecumbe that will be excacerbated by increased traffic volumes or by additional land use growth in Edgecumbe
14	Severance of Mata by SH2 a high volume road with high proportion of heavy vehicles. Growth in traffic volumes on this route will exacerpate the problem
15	everance and safety issues for active transport users with lmiited facilities provided and a high proportion of heavy vehicles
16	Severance and safety issues for active transport users with lmiited facilities provided and a high proportion of heavy vehicles
17	Poor maintenaince and a Medium Infrastructure Risk Rating ontributes to a high accident rate
18	Severance issues for active transport users compunded by increasing traaffic and active transport users

Network Constraints – points provided

ID	Project Name
0	Whakatane Bridge Resilience to flood or earthquake events. Potential to isolate significant population without access to essential services. Compounded by lack of resilience in Pekatahi Bridge
1	Pekatahi Bridge Resilience to flood and earthquake. One of two bridges providing access to Whakatane both with potential resilience issues to flood and earthquake.
2	SH34/SH30 Intersection has poor safety record and likely to see increased traffic under most scenarios
3	Lack of safe and appropriate crossings points creates severance issues for residents and inparticular for the local school
4	Ongoing Slips are causing frequent road closures and are likely to continue through this section. Detour route unsuitable for heavy vehicles
5	On-goign safety issues, High DSIs
6	Debris Flows may cut off SH or other parts of Matata
7	Safety. Areas of the corridor are not currently suitable for existing volumes of traffic
8	Reliability through the gorge due to regular land slides with very limited detour options.
9	Existing costraints on heavy vehicles and expected growth over next ten years
10	East Cape Roads (SH35) not well suited for heavy vehicles but ongoing development of industry east of Opotiki will increase truck volumes
11	East Cape Roads (SH35) not well suited for heavy vehicles but ongoing development of industry east of Opotiki will increase truck volumes and creat additional severance issues for communities along the road
12	East Cape Roads (SH35) not well suited for heavy vehicles but ongoing development of industry east of Opotiki will increase truck volumes creating safety issues on this road for all users
13	Sections of Wainui Road are prone to coastal inundation and slips.



Network Assumptions

Network assumptions / questions:

- For PT there is an urban bus network we're I've suggested a nominal 30min freq, and an inter-city network with a 60min nominal frequency
  - **Is this the same in both scenarios? Would there be different networks?**
- For Cycling I've included a primary urban network and a rural trails network between centres
  - **Is this the same in both scenarios? Would there be different networks?**
- For the roading network I've only included info for the 2nd Whakatane River crossing. Outside of this network improvements will likely be targeted around safety and new local roads to accommodate growth.
  - **Any parking changes?**
  - **Assume we model without and with all changes, no combinations**
  - (Zone 34/35, extra $5, effect on VKT and Emission)
- Fuel price increase (+100%)

Network Intervention Scenarios – 4 (x2) in total

Network Changes:

- PT, cycle route improvements and new bridge for all traffic

Policy Changes

- Parking charges
- Fuel price changes

Network + Policy Changes

(On Max Infill and New Town scenarios)

Next Steps

Model scenarios with network assumptions applied

Complete transport planning inputs – table of initiatives (resilience, safety, capacity, PT, W&C), way forward

Reporting

Present approach and key findings in Whakatane, late April – confirm date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B

Appendix B – Future Scenarios

Eastern Bay of Plenty Sketch Planning Tool

Network Intervention Results

April 2024

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Network Assumptions

Network assumptions / questions:

- For PT there is an urban bus network we're I've suggested a nominal 30min freq, and an inter-city network with a 60min nominal frequency
  - **Is this the same in both scenarios? Would there be different networks?**
- For Cycling I've included a primary urban network and a rural trails network between centres
  - **Is this the same in both scenarios? Would there be different networks?**
- For the roading network I've only included info for the 2nd Whakatane River crossing. Outside of this network improvements will likely be targeted around safety and new local roads to accommodate growth.
  - **Any parking changes?**
  - **Assume we model without and with all changes, no combinations**
  - (Zone 34/35, extra $5, effect on VKT and Emission)
- Fuel price increase (+100%)

Network Intervention Scenarios – 4 (x2) in total

Network Changes:

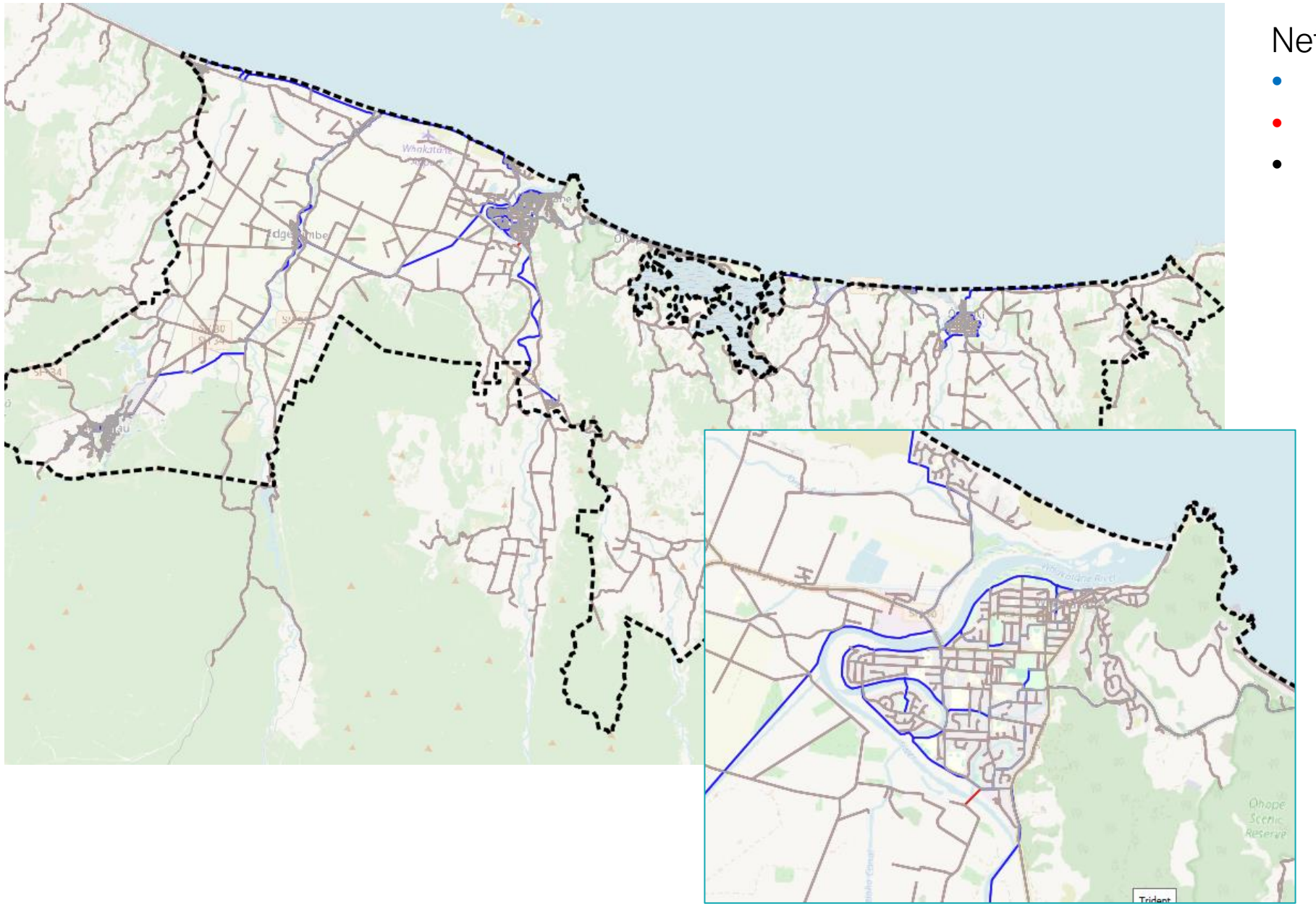
- PT, cycle route improvements and new bridge for all traffic

Policy Changes

- Parking charges
- Fuel price changes

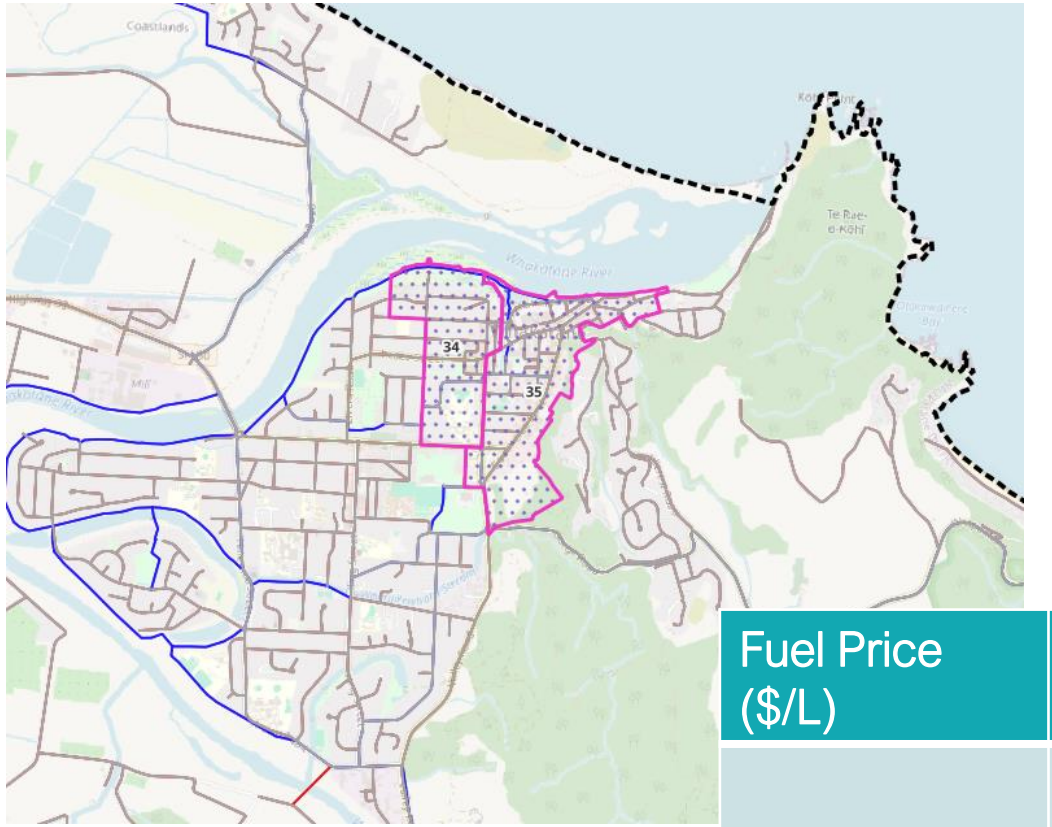
Network + Policy Changes

(On Max Infill and New Town scenarios)



Network Changes

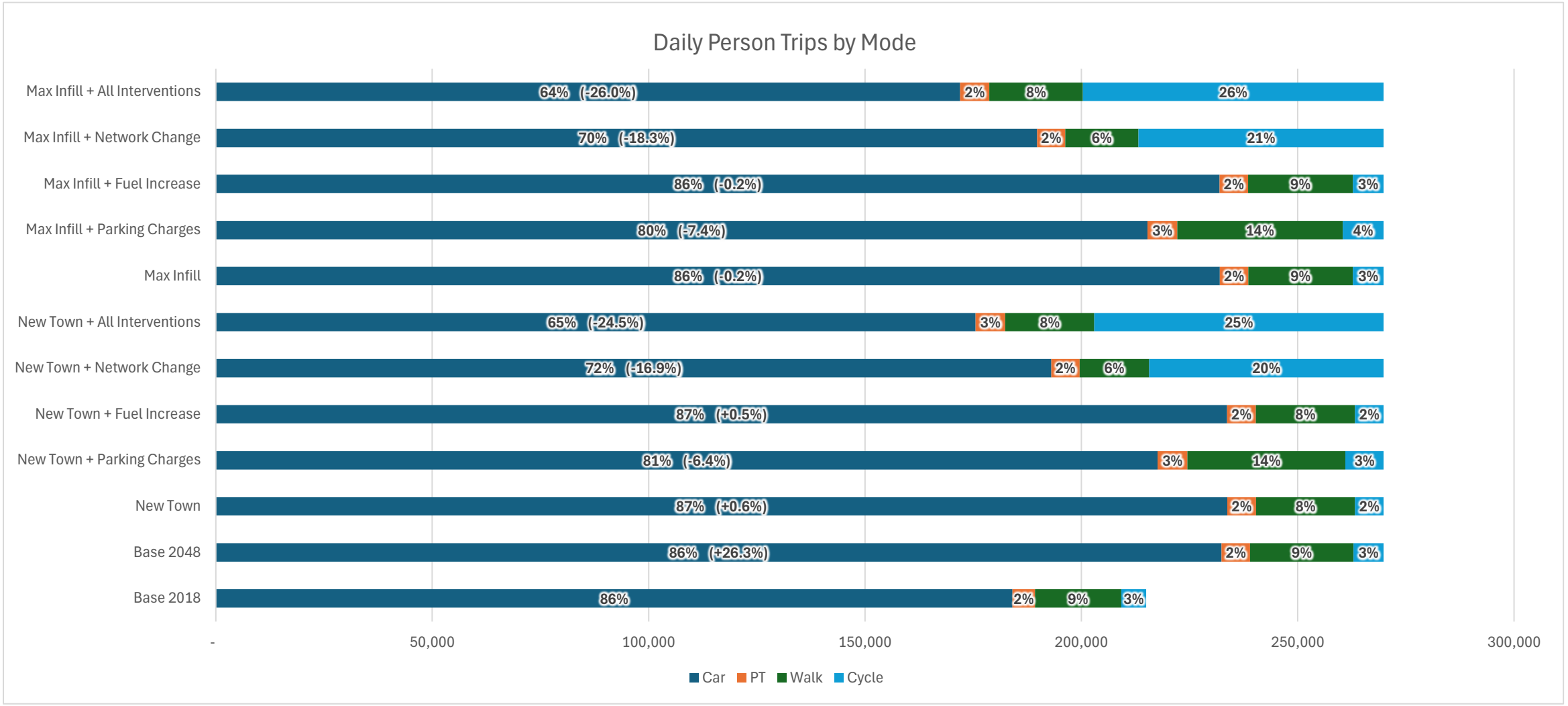
- New Cycle Network
- New Bridge Connection
- Better PT Access

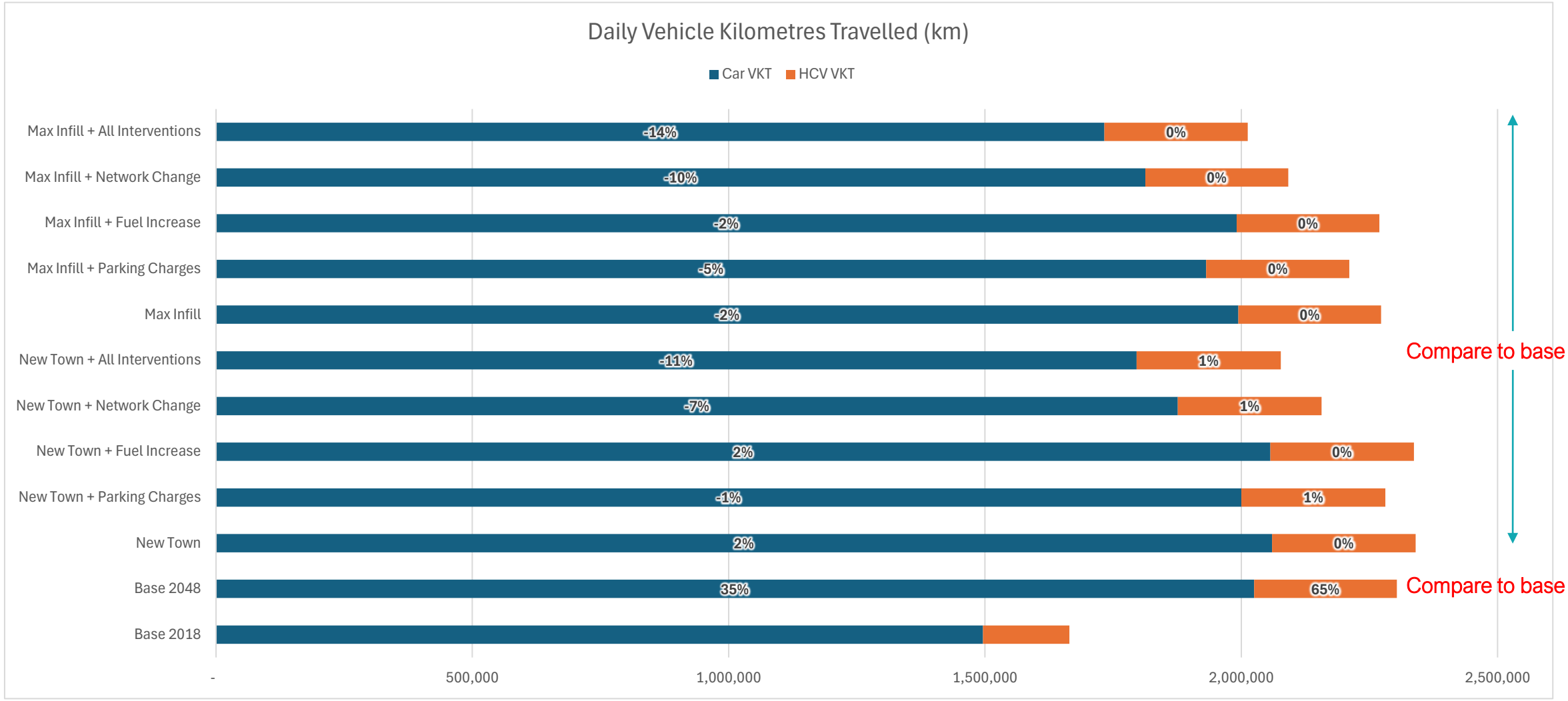


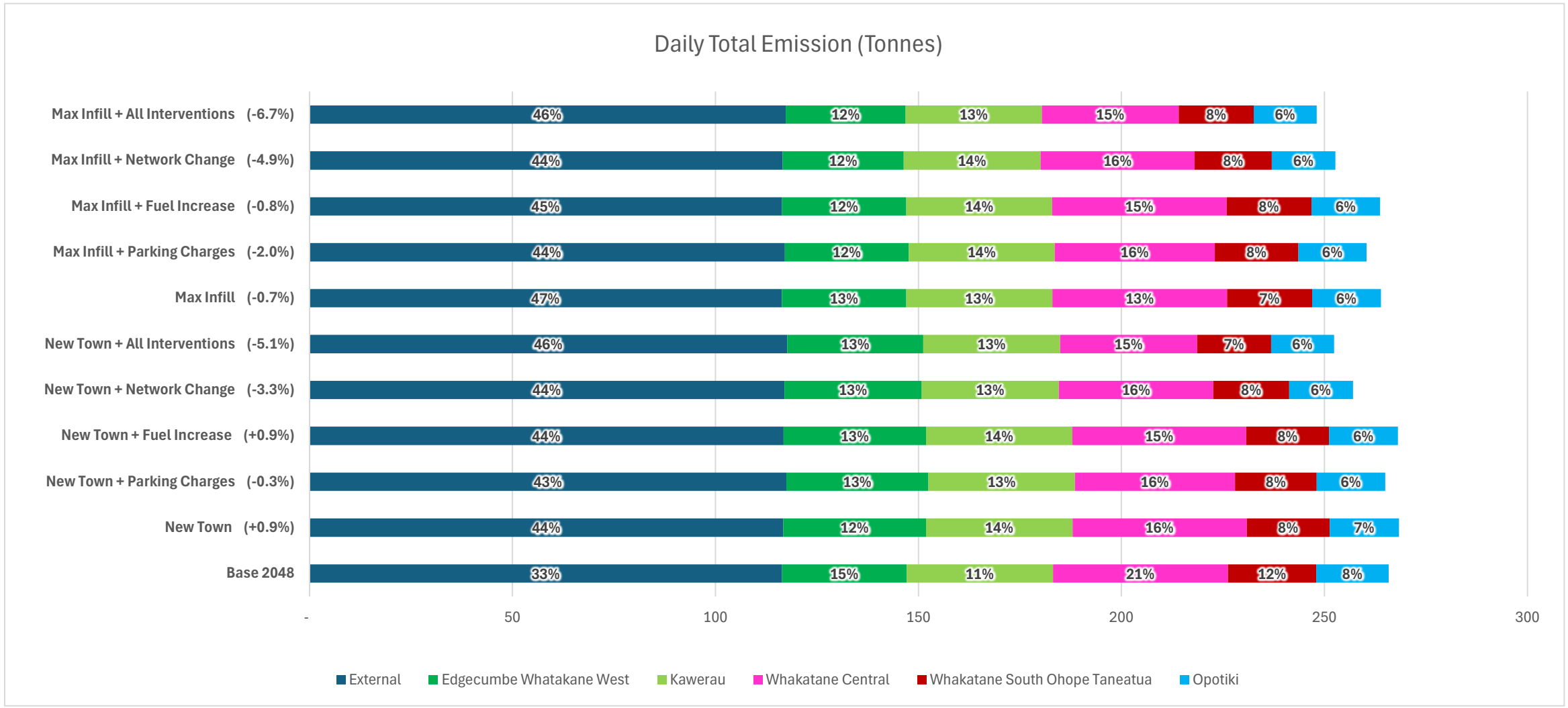
Policy Changes

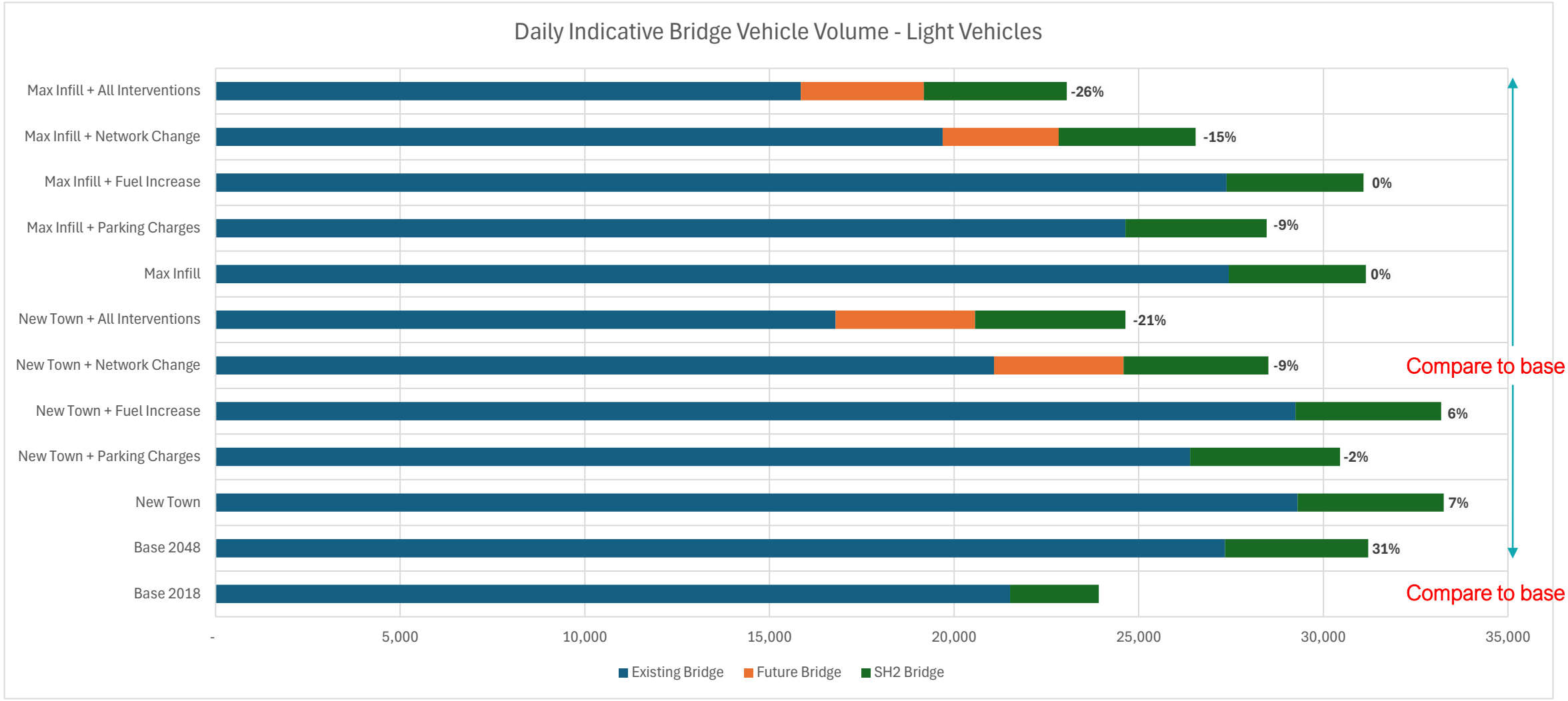
- Parking Charges ($5)
- Fuel Price Increase (x2) and Road User Charges (x2)

Fuel Price ($/L)	Vehicle Operating Cost (Petrol)		Vehicle Operating Cost (Deisel)	
	Fuel	RUC	Fuel	RUC
Base (2018)	$2.19	$0.02	$1.41	$0.39
Increased	$4.38	$0.10	$2.82	$0.78





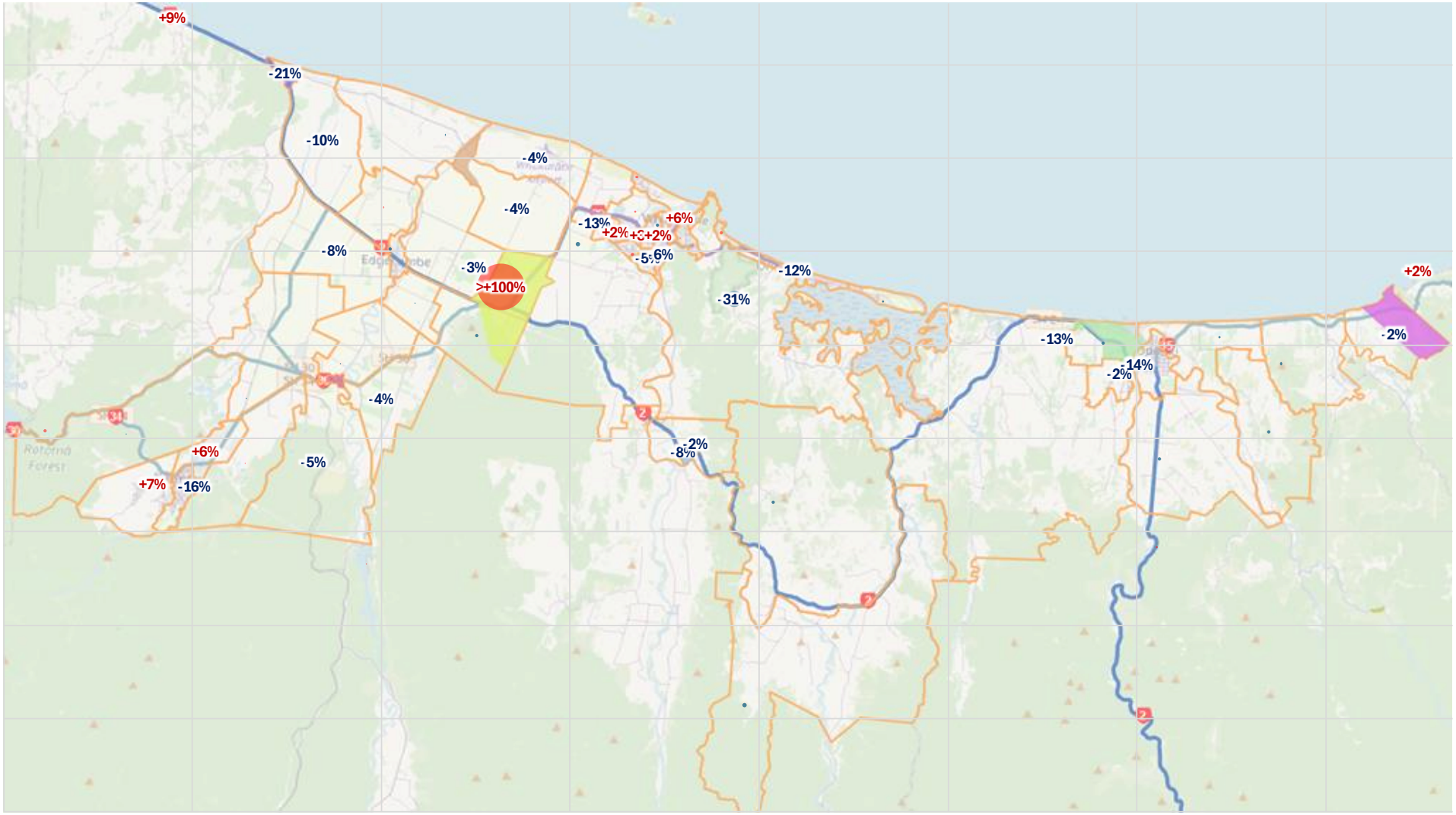

Daily Total Emission (Tonnes)
Max Infill + All Interventions (-6.7%)
Max Infill + Network Change (-4.9%)
Max Infill + Fuel Increase (-0.8%)
Max Infill + Parking Charges (-2.0%)
Max Infill (-0.7%)
New Town + All Interventions (-5.1%)
New Town + Network Change (-3.3%)
New Town + Fuel Increase (+0.9%)
New Town + Parking Charges (-0.3%)
New Town (+0.9%)
Base 2048
46% 12% 13% 15% 8% 6%
44% 12% 14% 16% 8% 6%
45% 12% 14% 15% 8% 6%
44% 12% 14% 16% 8% 6%
47% 13% 13% 13% 7% 6%
46% 13% 13% 15% 7% 6%
44% 13% 13% 16% 8% 6%
44% 13% 14% 15% 8% 6%
43% 13% 13% 16% 8% 6%
44% 12% 14% 16% 8% 7%
33% 15% 11% 21% 12% 8%
- 50 100 150 200 250 300
External
Edgecumbe Whatakane West
Kawerau
Whakatane Central
Whakatane South Ohope Taneatua
Opotiki



Base	Base 2048
Option	New Town
For	Light Emission

	Base	Option	Difference		
Light Emission:	124	126	2	(1.6%)	Decrease / Increase

(Sized by absolute difference; Labelled by percentage of total difference)



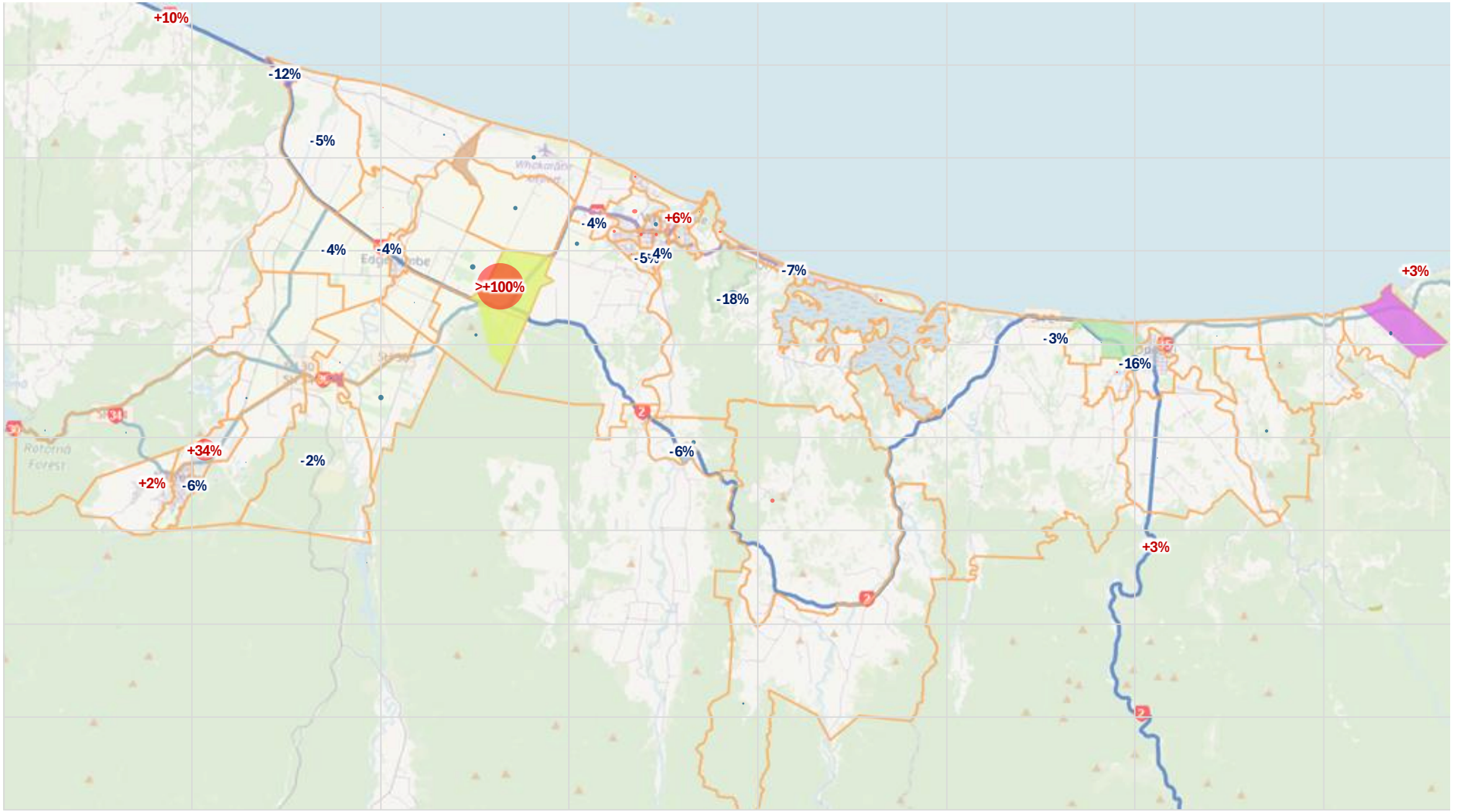
Base	Base 2048
Option	New Town
For	Heavy Emission

	Base	Option	Difference	
Heavy Emission:	142	143	1	(0.4%)

Decrease

Increase

(Sized by absolute difference; Labelled by percentage of total difference)



Beca

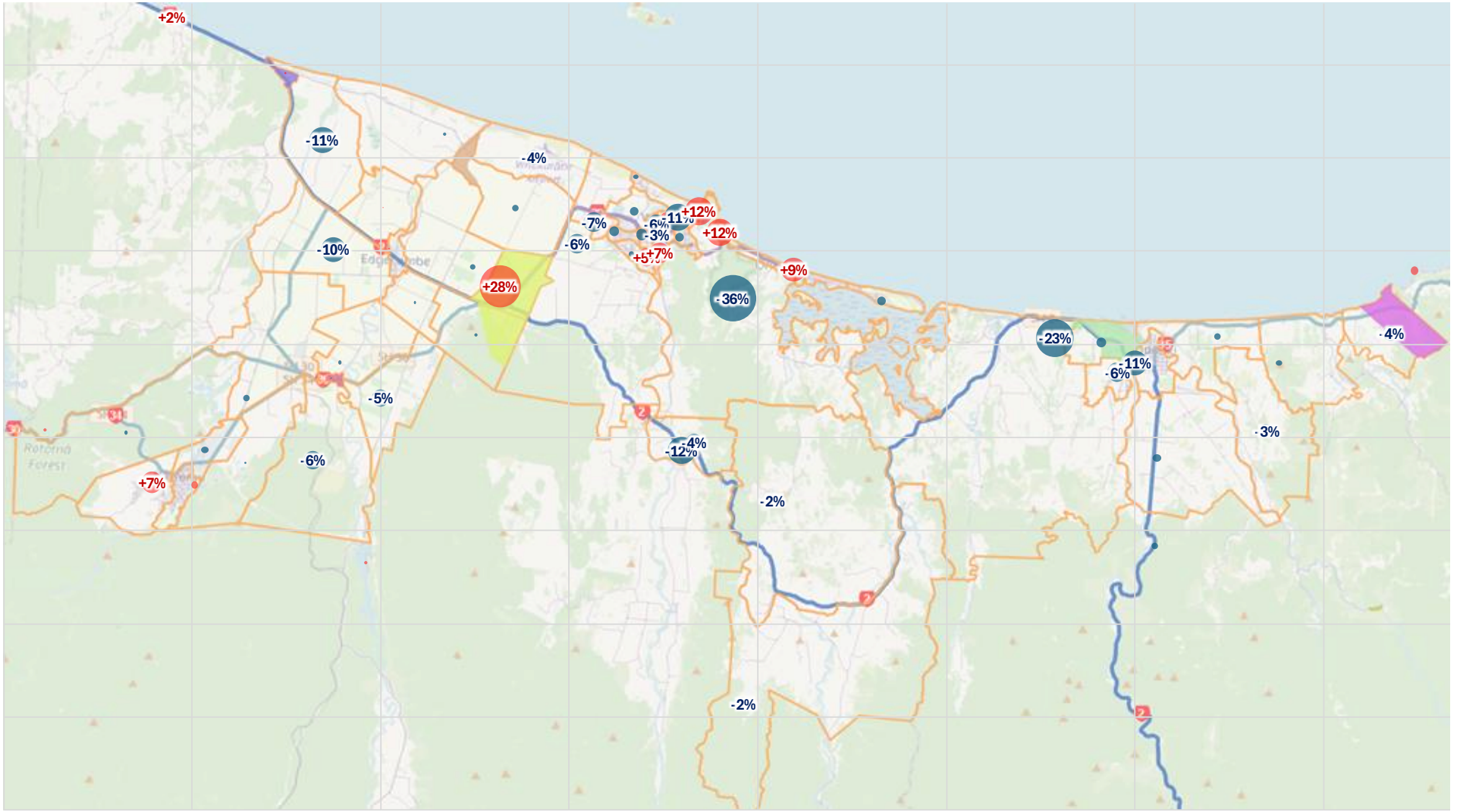
Base	Base 2048
Option	Max Infill
For	Light Emission

	Base	Option	Difference		
Light Emission:	124	122	-2	(-1.4%)	

Decrease

Increase

(Sized by absolute difference; Labelled by percentage of total difference)



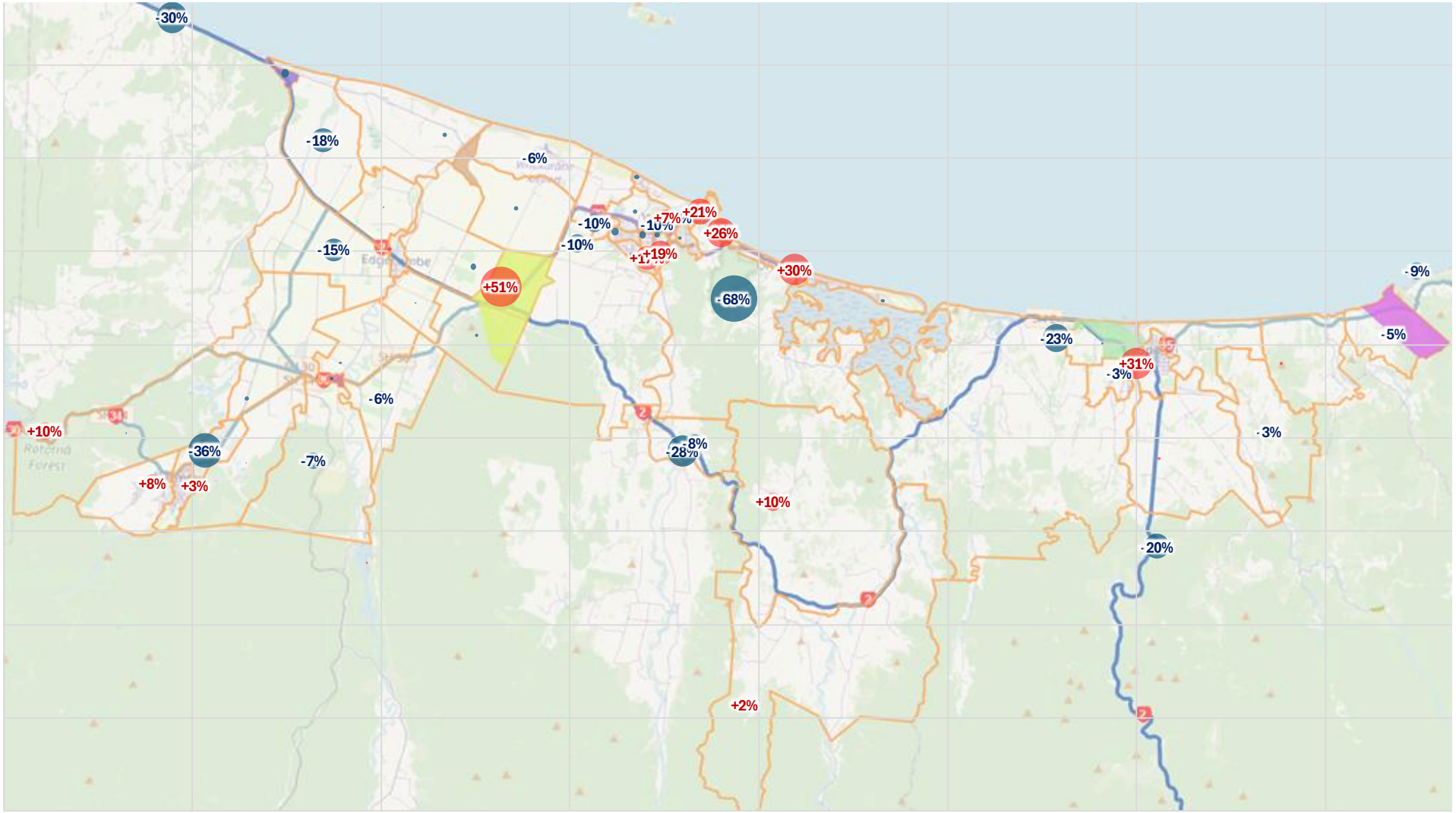
Base	Base 2048
Option	Max Infill
For	Heavy Emission

	Base	Option	Difference	
Heavy Emission:	142	142	0	(-0.1%)

Decrease

Increase

(Sized by absolute difference; Labelled by percentage of total difference)



Beca

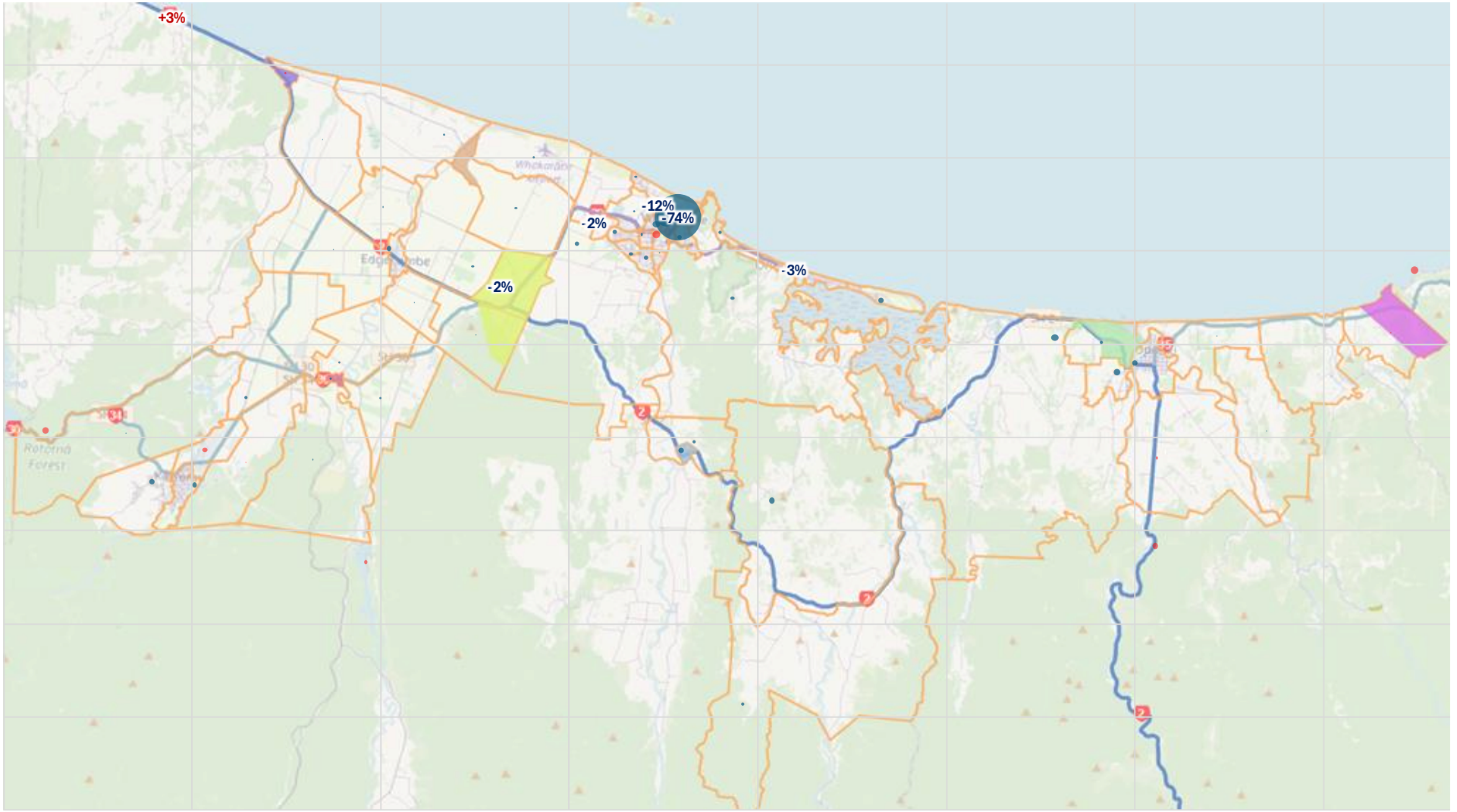
Base	New Town
Option	New Town + Parking Charges
For	Light Emission

	Base	Option	Difference		
Light Emission:	126	122	-4	(-3.0%)	

Decrease

Increase

(Sized by absolute difference; Labelled by percentage of total difference)



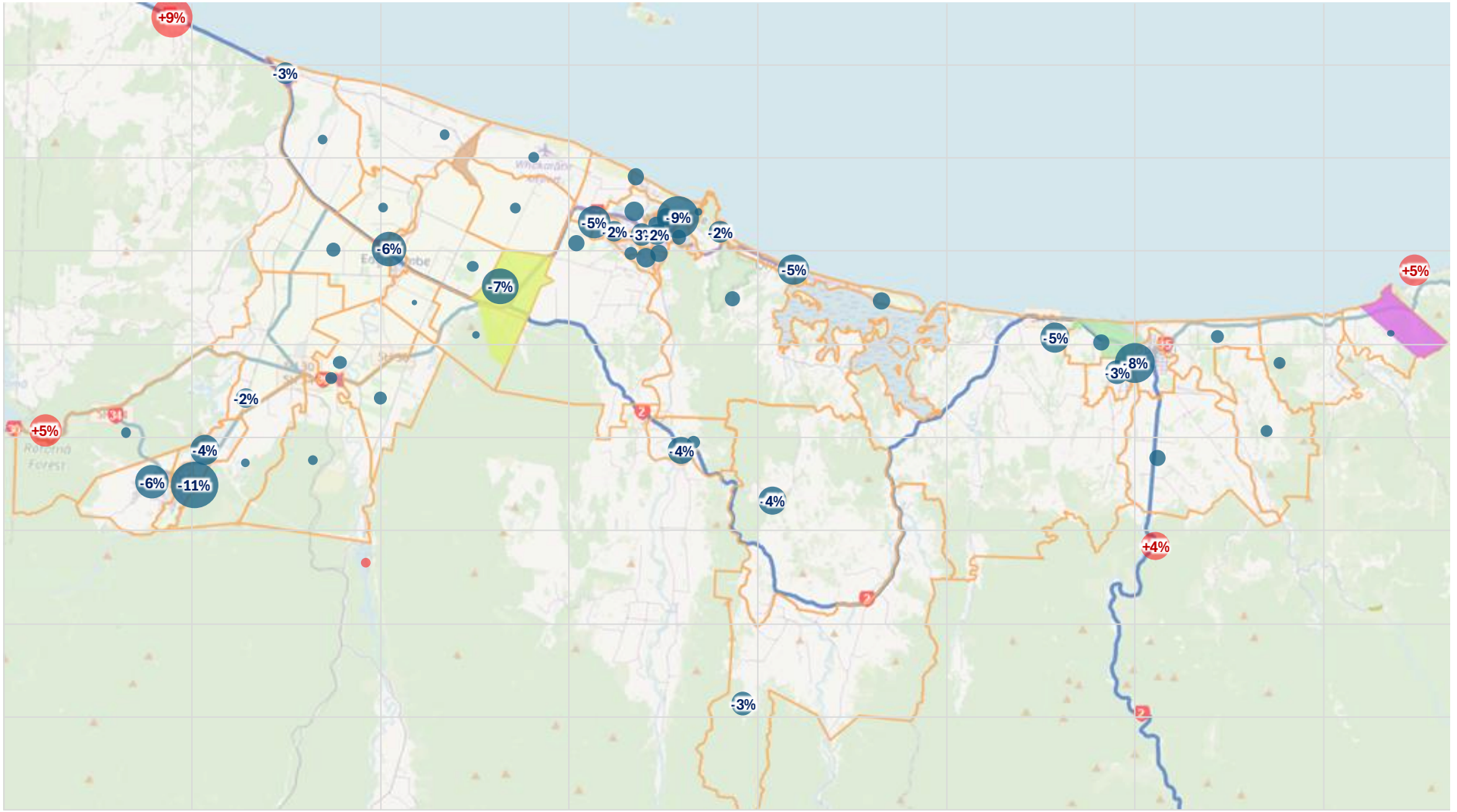
Base	New Town
Option	New Town + Fuel Increase
For	Light Emission

	Base	Option	Difference	
Light Emission:	126	125	0	(-0.2%)

Decrease

Increase

(Sized by absolute difference; Labelled by percentage of total difference)



Beca

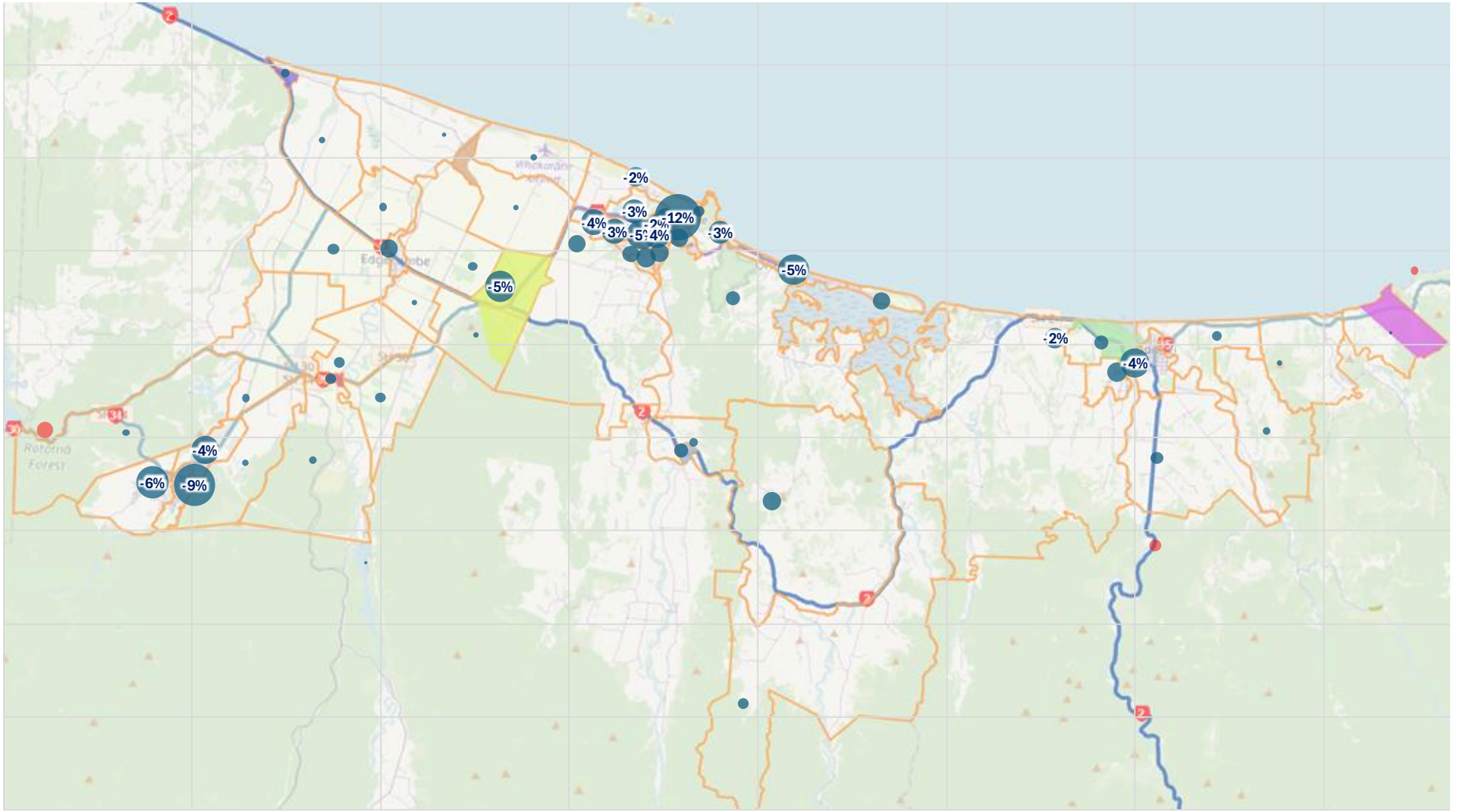
Base	New Town
Option	New Town + Network Change
For	Light Emission

	Base	Option	Difference	
Light Emission:	126	114	-11	(-9.1%)

Decrease

Increase

(Sized by absolute difference; Labelled by percentage of total difference)



Beca

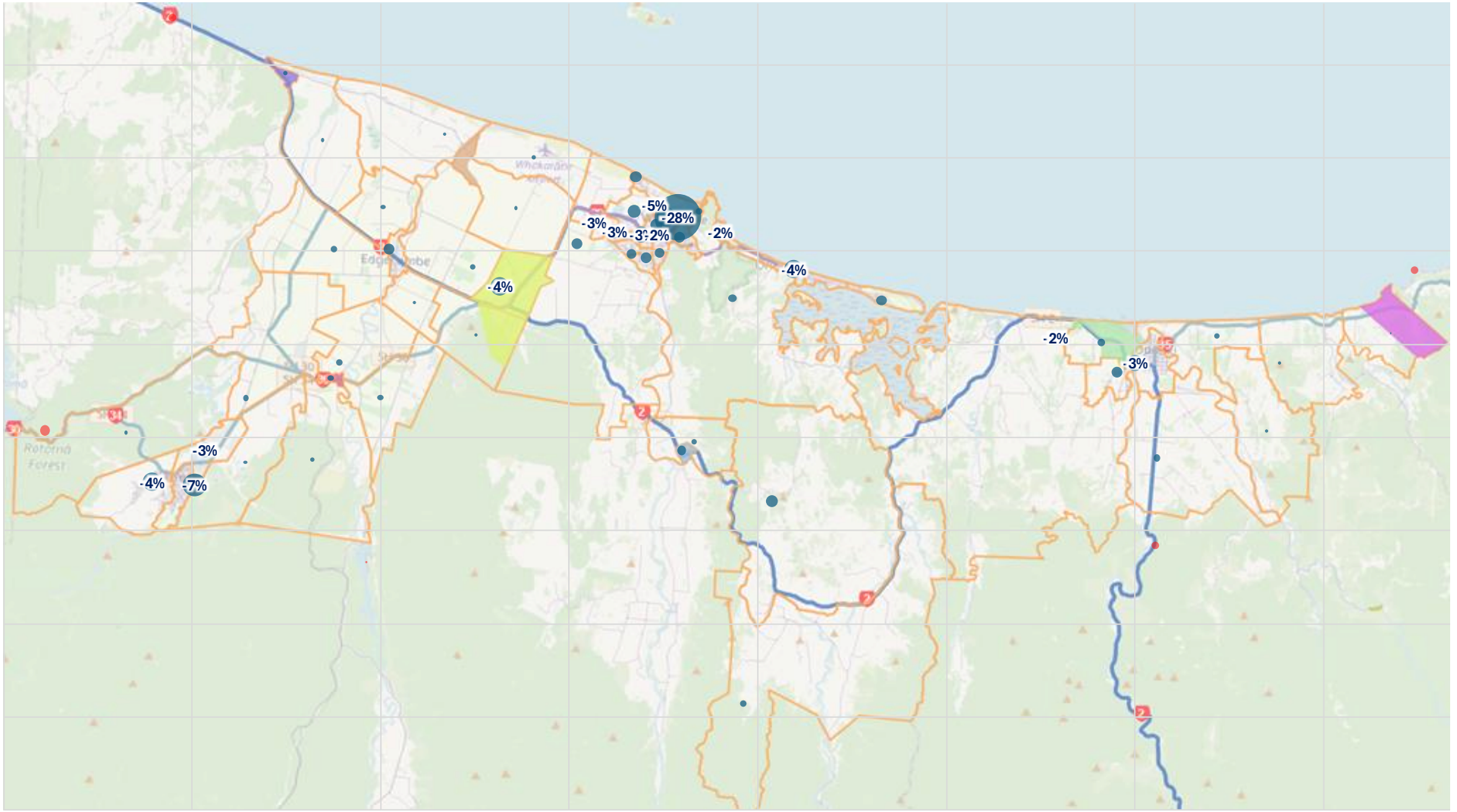
Base	New Town
Option	New Town + All Interventions
For	Light Emission

	Base	Option	Difference		
Light Emission:	126	109	-17	(-13.2%)	

Decrease

Increase

(Sized by absolute difference; Labelled by percentage of total difference)



Beca

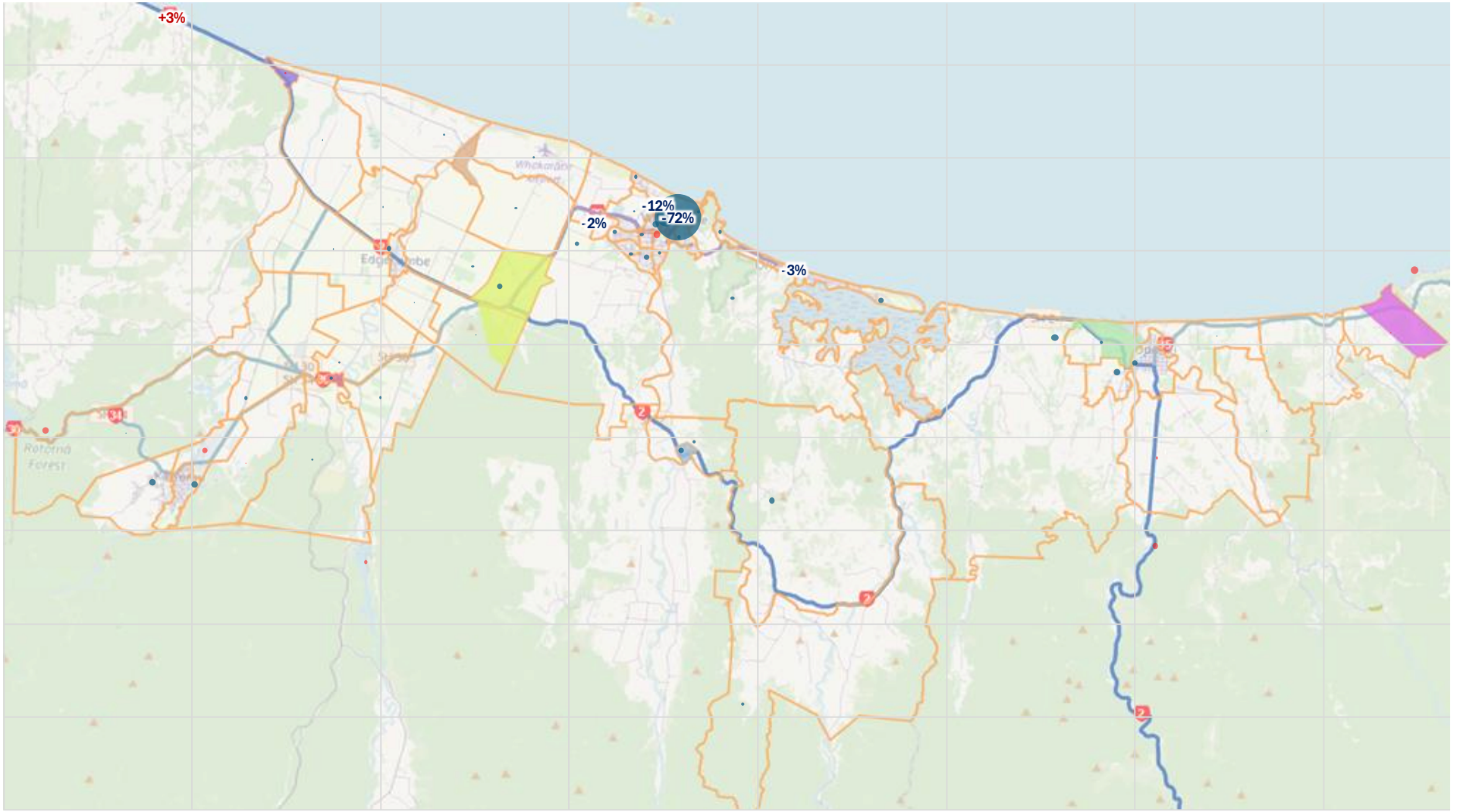
Base	Max Infill
Option	Max Infill + Parking Charges
For	Light Emission

	Base	Option	Difference	
Light Emission:	122	118	-4	(-3.3%)

Decrease

Increase

(Sized by absolute difference; Labelled by percentage of total difference)



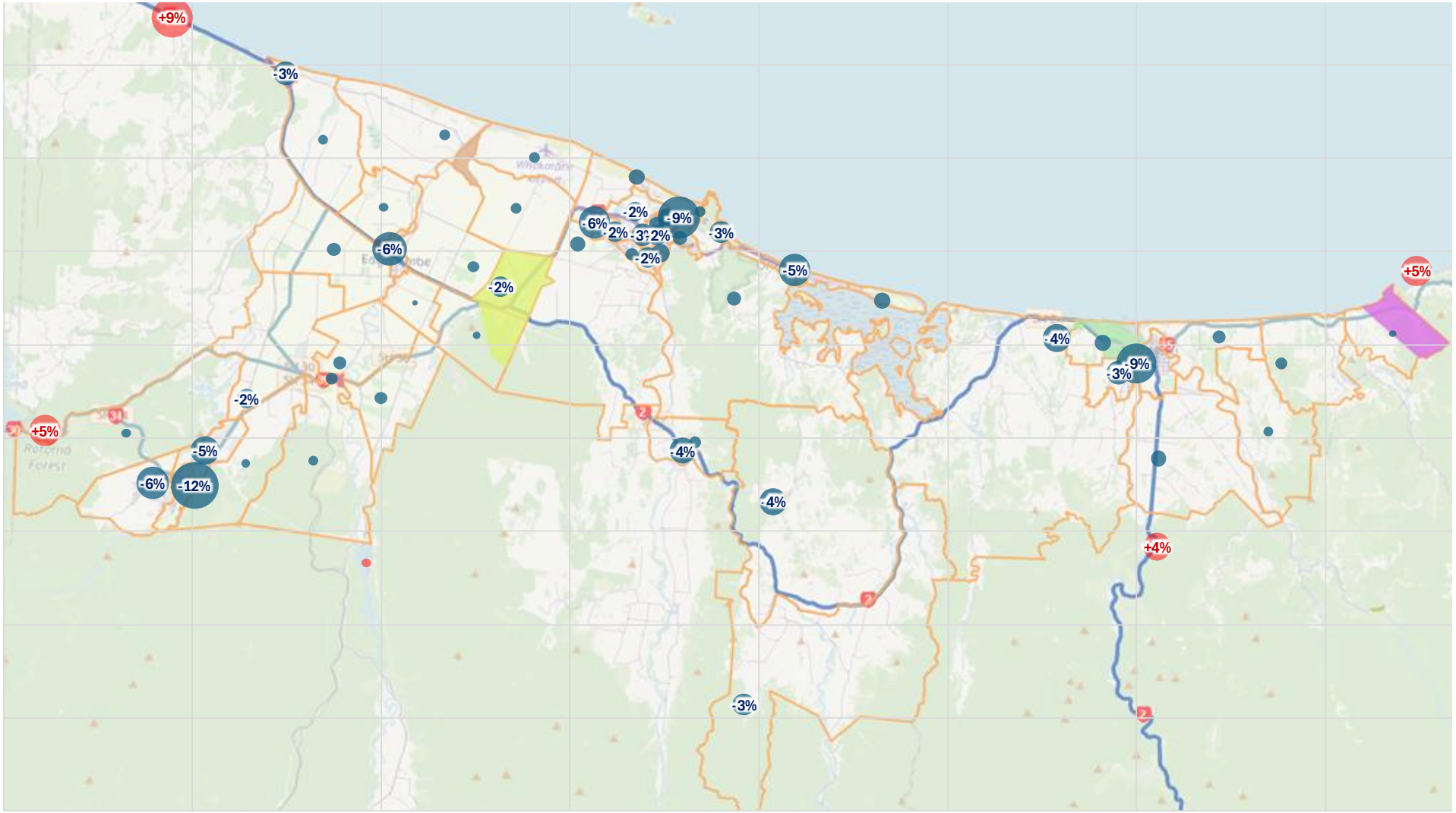
Base	Max Infill
Option	Max Infill + Fuel Increase
For	Light Emission

	Base	Option	Difference	
Light Emission:	122	122	0	(-0.2%)

Decrease

Increase

(Sized by absolute difference; Labelled by percentage of total difference)



Beca

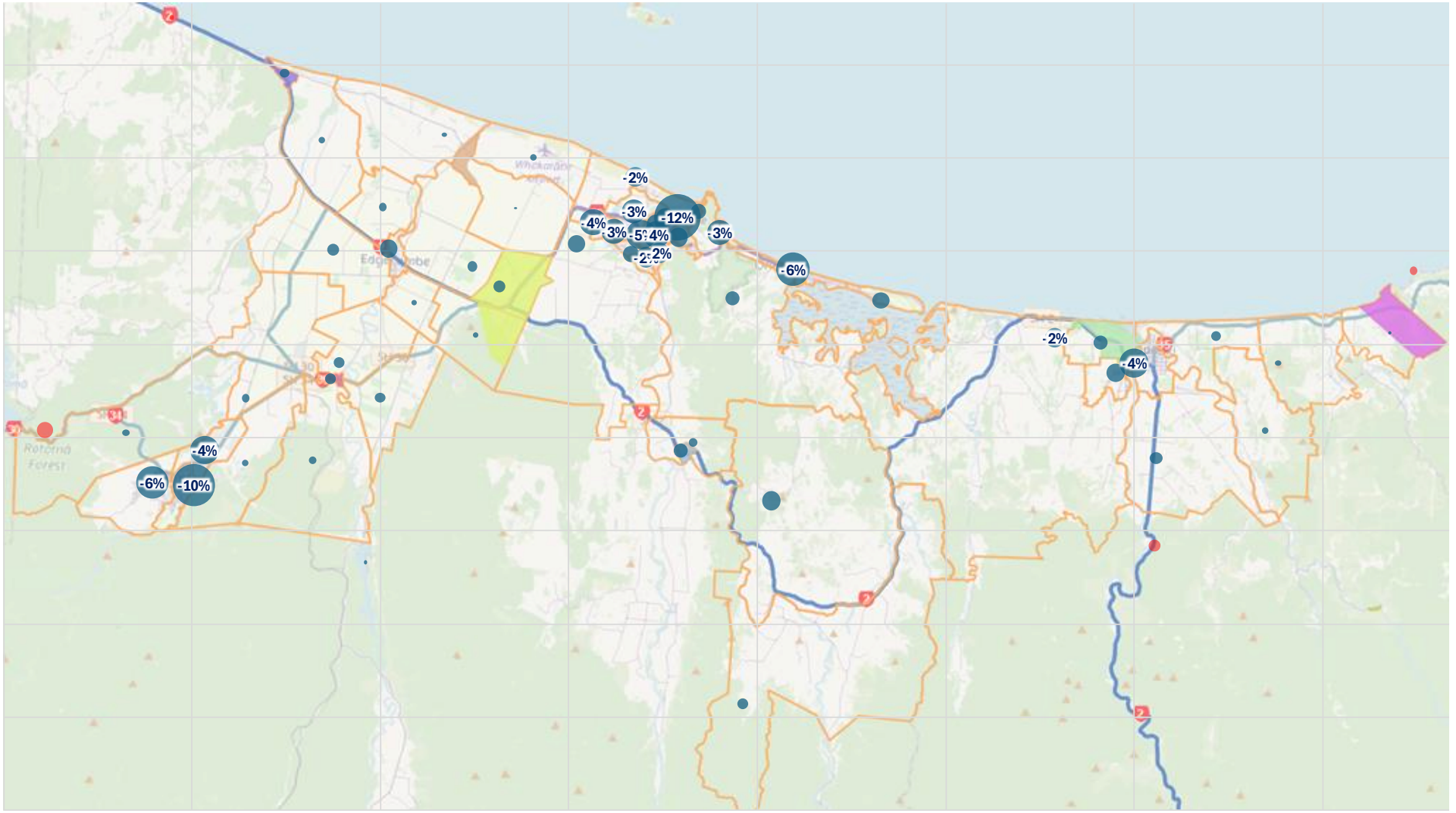
Base	Max Infill
Option	Max Infill + Network Change
For	Light Emission

	Base	Option	Difference	
Light Emission:	122	110	-11	(-9.4%)

Decrease

Increase

(Sized by absolute difference; Labelled by percentage of total difference)



Beca

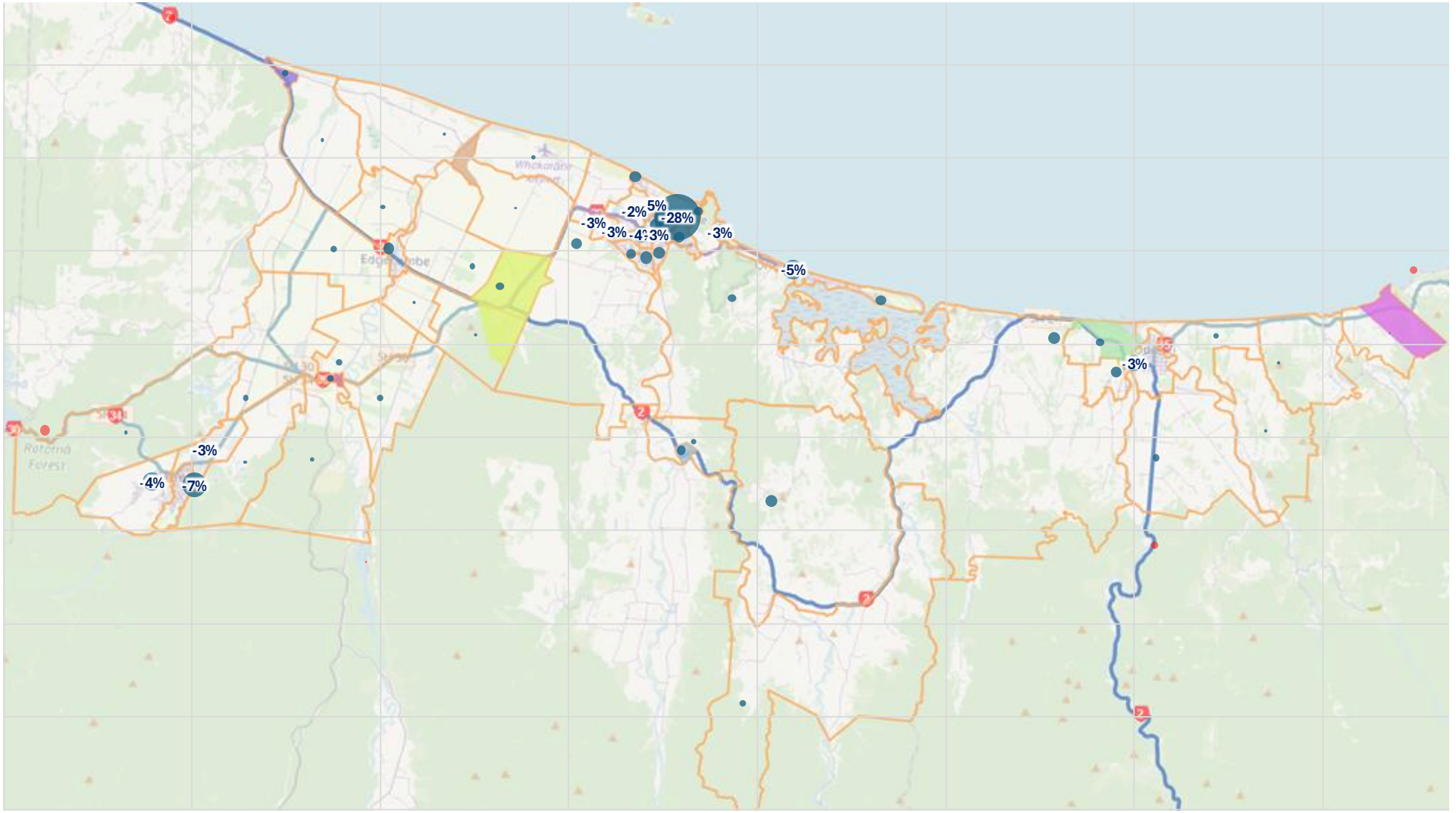
Base	Max Infill
Option	Max Infill + All Interventions
For	Light Emission

	Base	Option	Difference	
Light Emission:	122	105	-16	(-13.5%)

Decrease

Increase

(Sized by absolute difference; Labelled by percentage of total difference)

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C

Appendix C – Round 2 Modelling Results

Eastern Bay of Plenty Sketch Planning Tool

Second Round Modelling Results

June 2024

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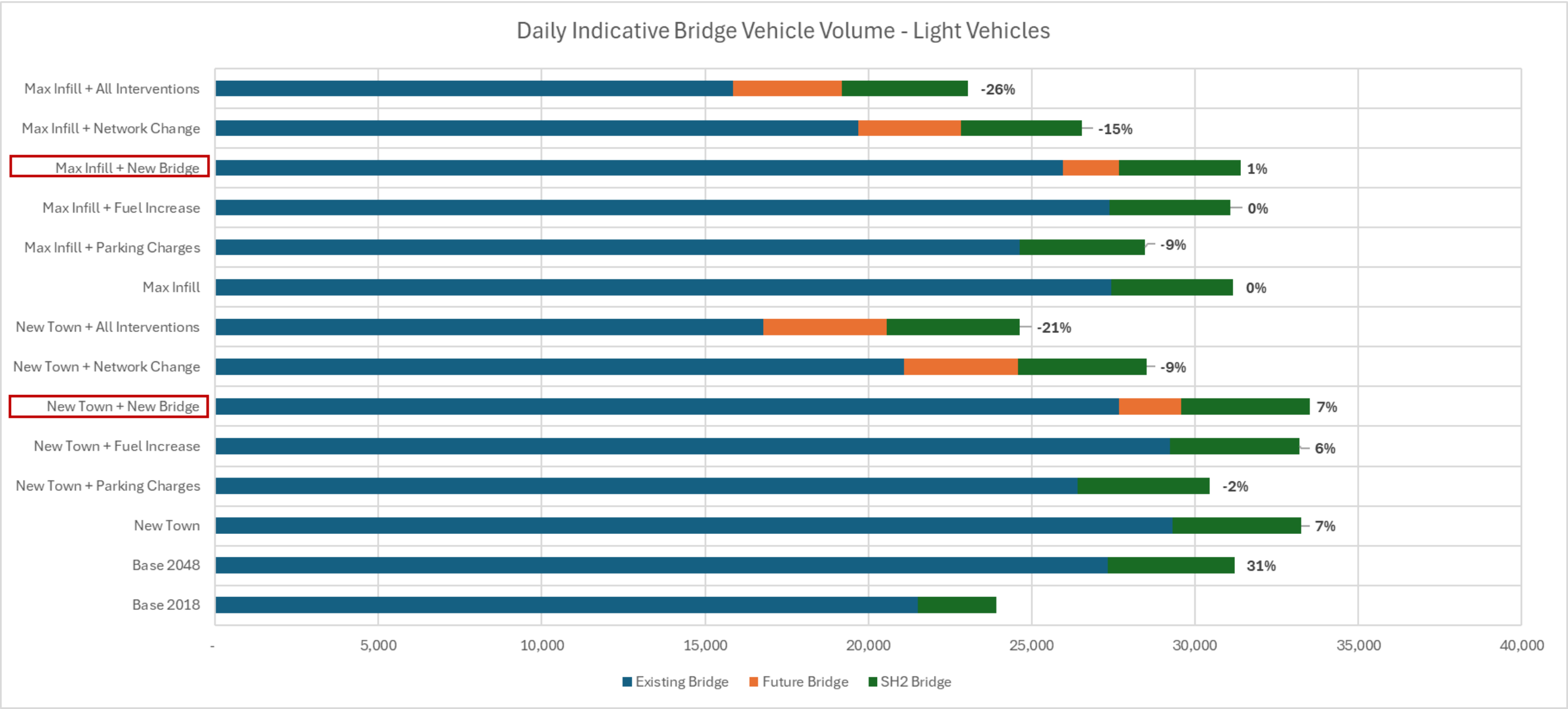
Network Assumptions

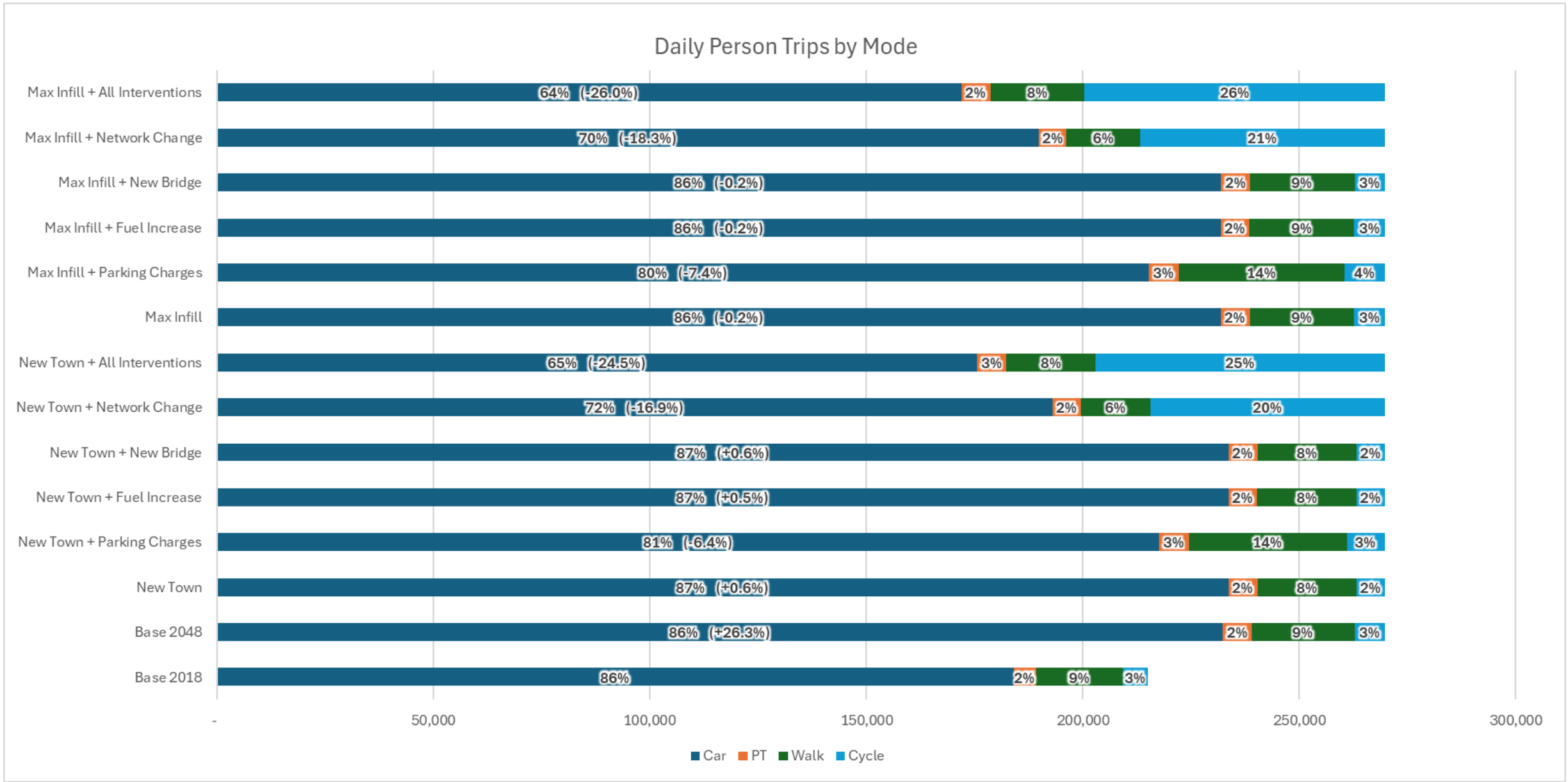
The Second Round Modelling Responds to Two Questions:

- **Bridge Intervention:** an additional model run with only the bridge intervention to isolate its effects.
- **Mode Share Breakdown:** Add a breakout of mode share for trips to Whakatane CBD, Opotiki CBD, and Kawerau CBD. This will help us tailor considerations for each area.

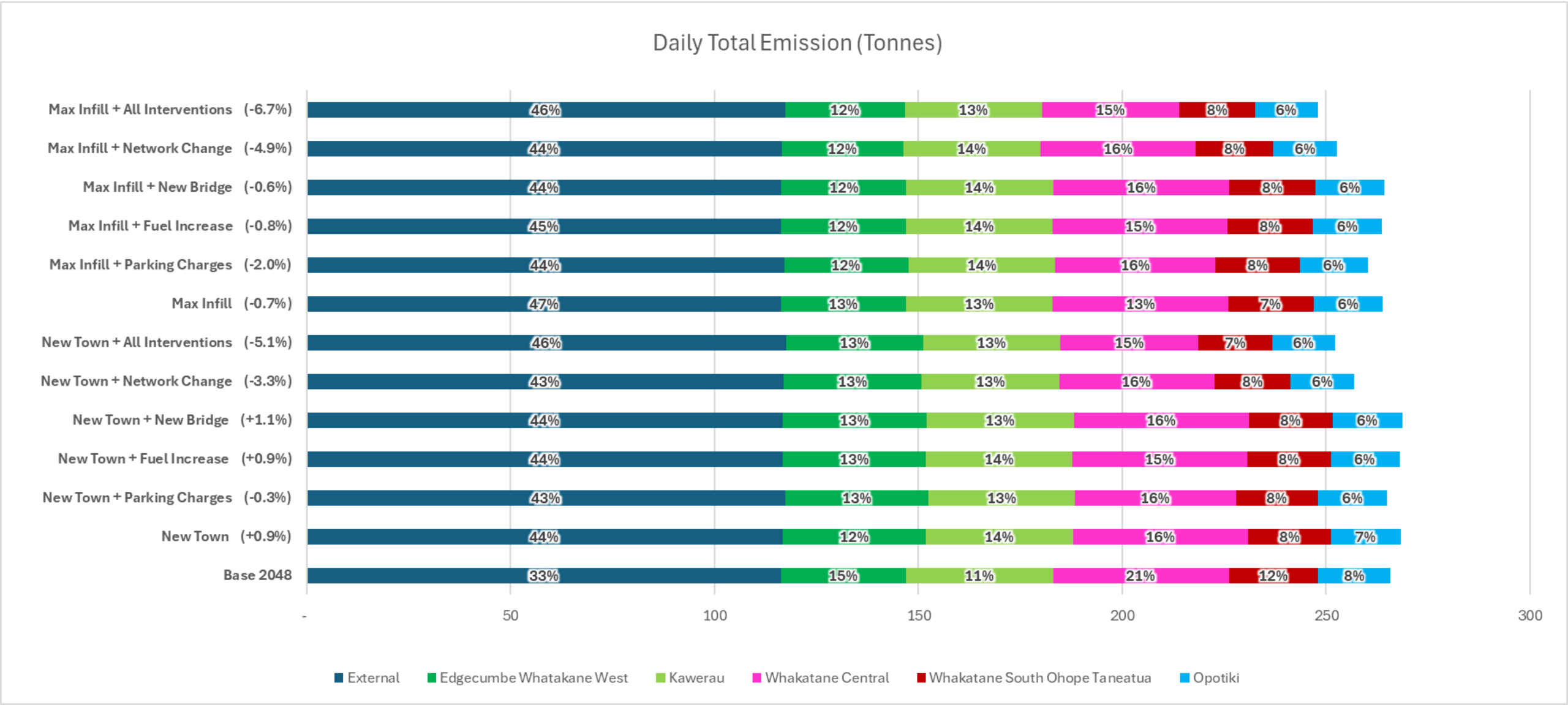
Bridge Intervention Results



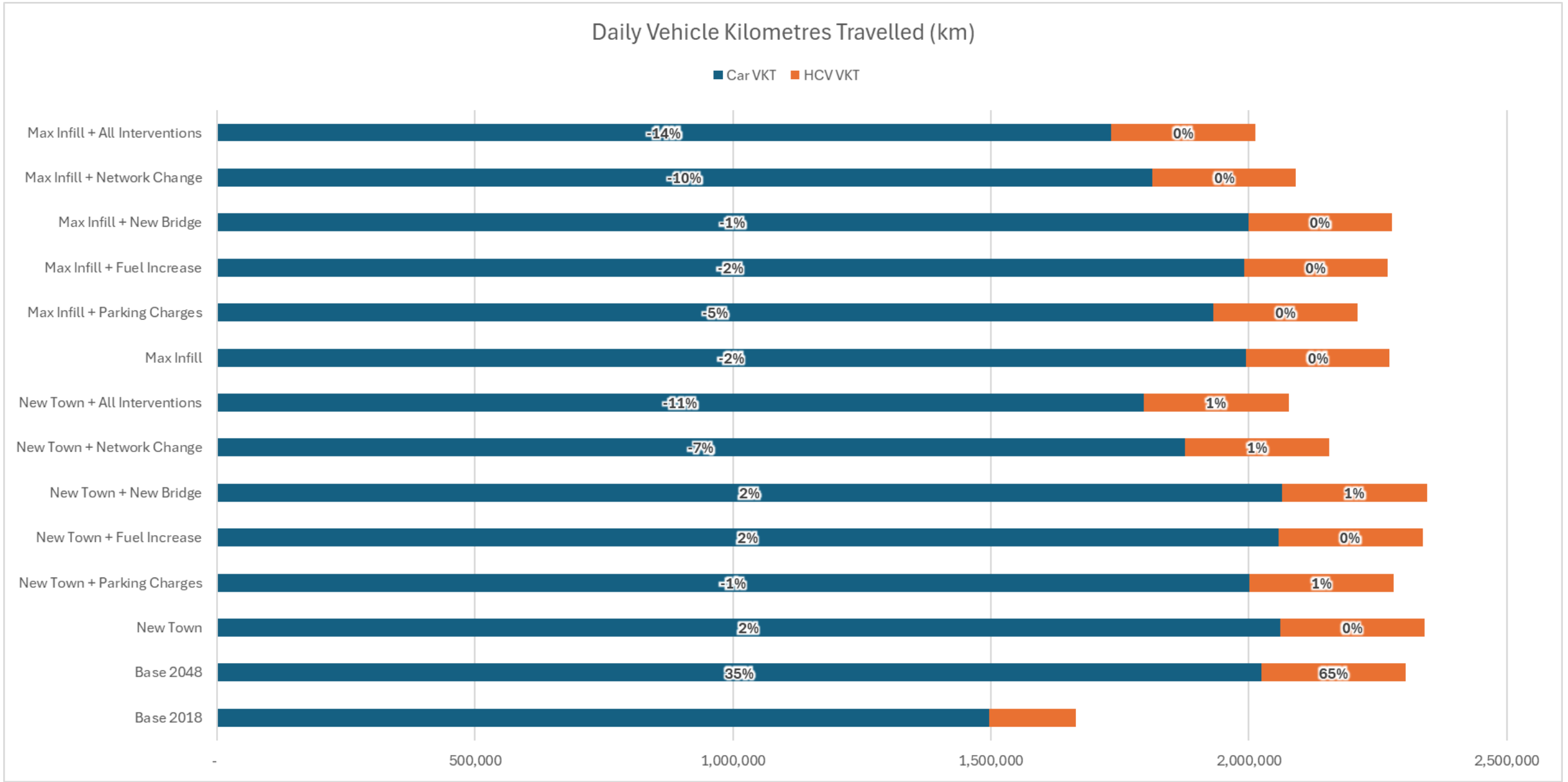
Bridge Intervention Results



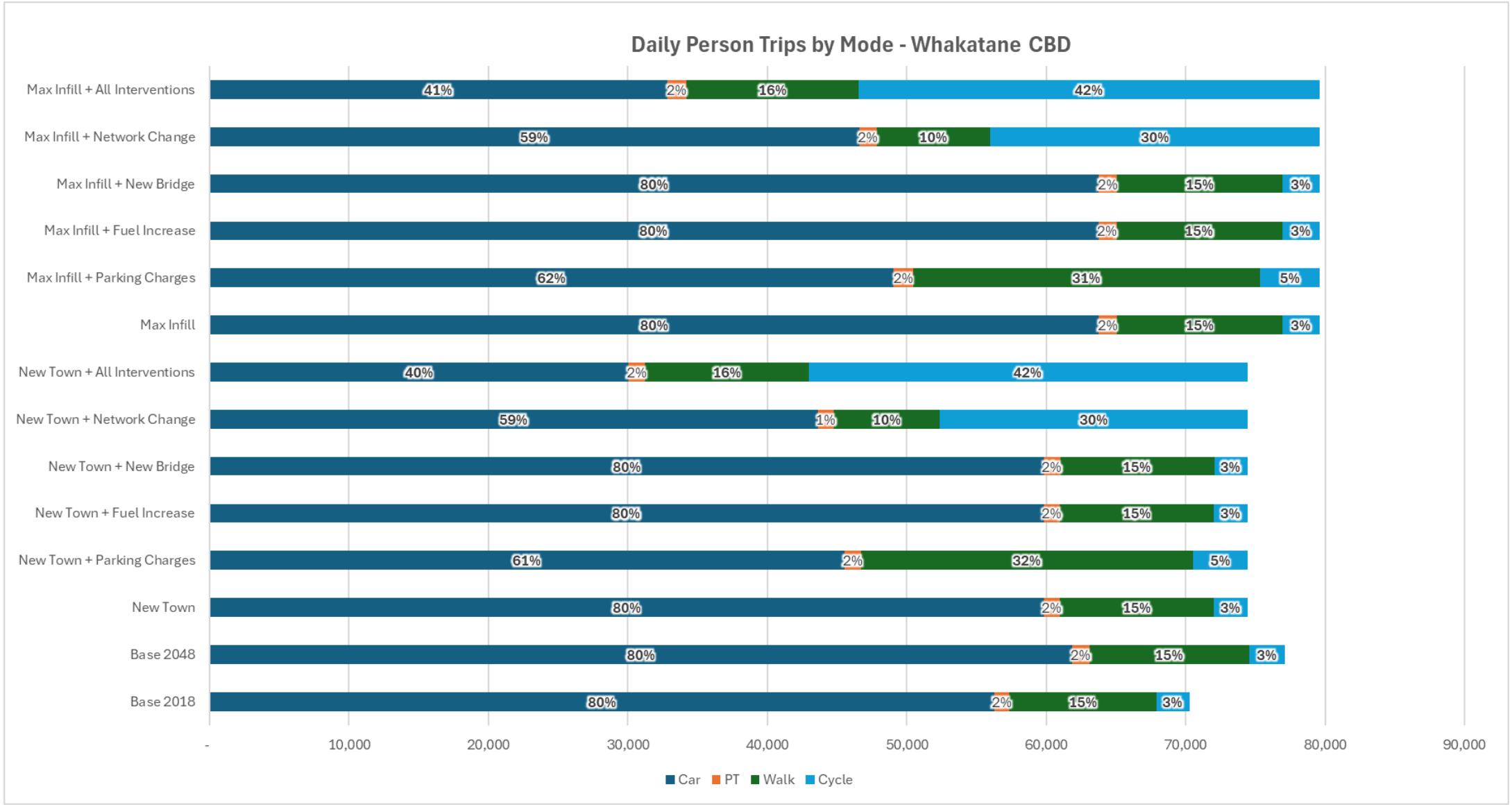
Bridge Intervention Results



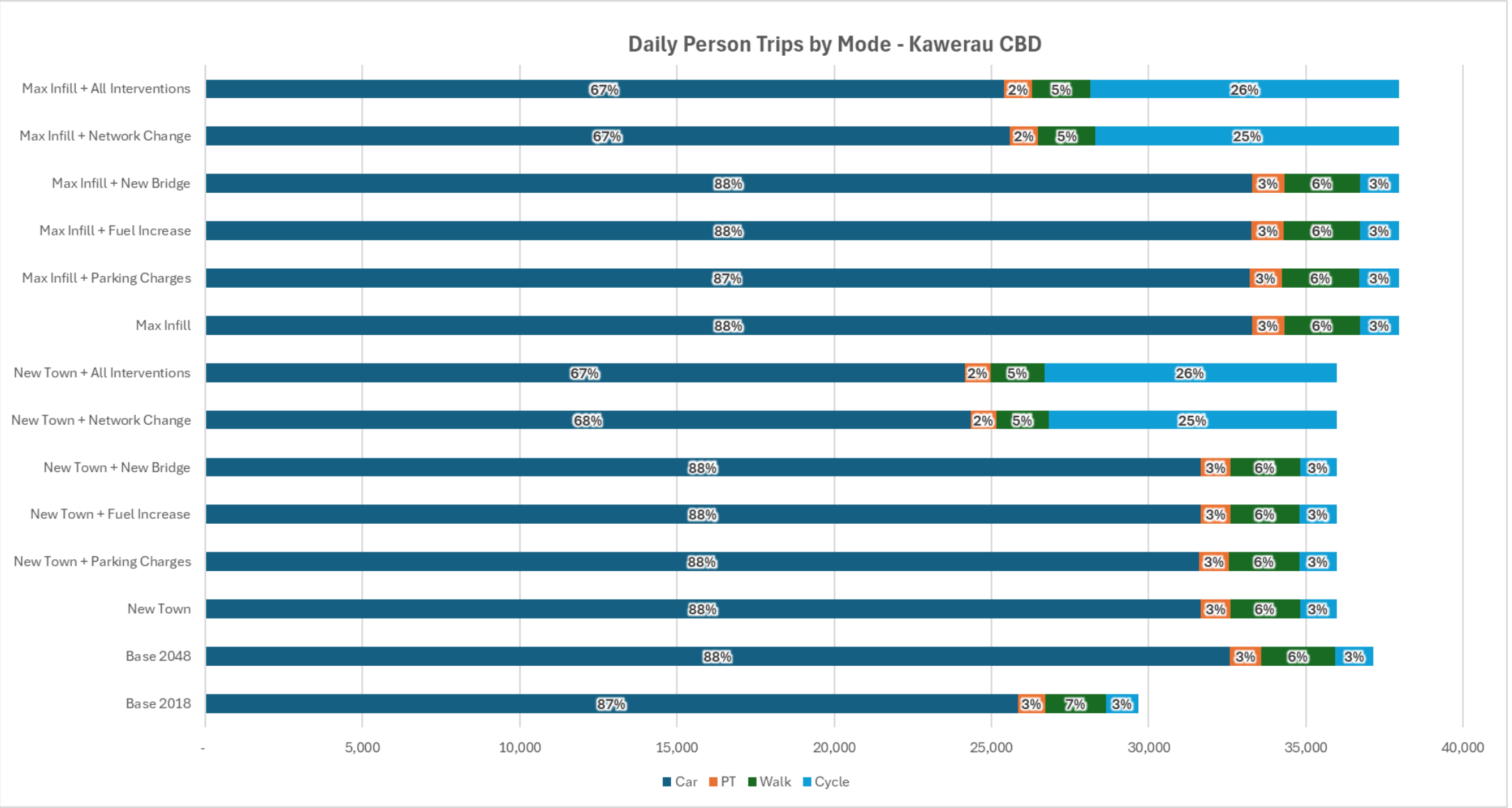
Bridge Intervention Results



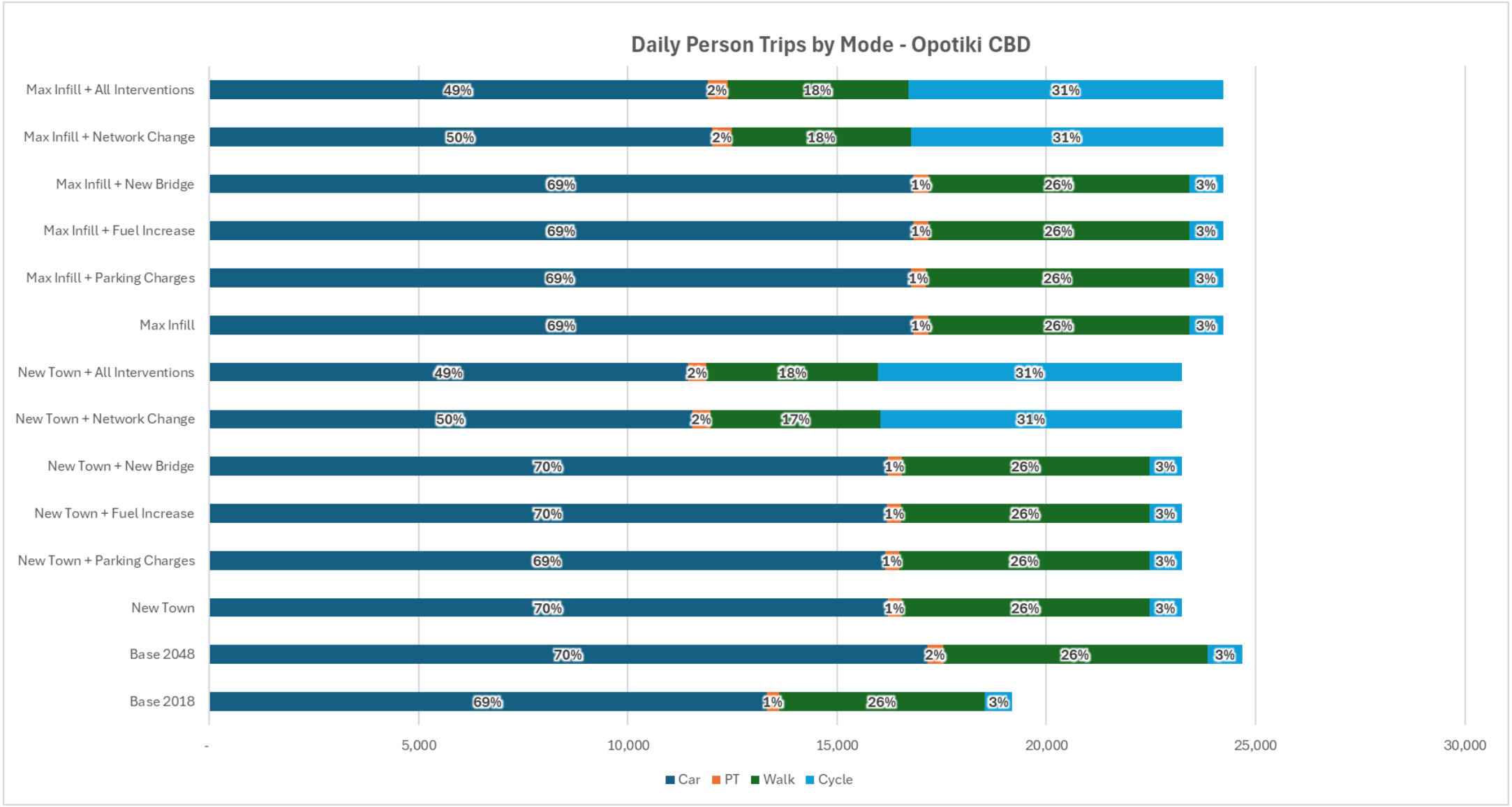
Mode Share Results



Mode Share Results



Mode Share Results

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Appendix 5

Multi criteria analysis (2025)

Appendix 5 – Multi Criteria Analysis

The refined short-list of development options and the new development areas requested by submitters through community engagement on the Spatial Plan are included in this Multi Criteria Analysis ("MCA"). In a spatial planning context, MCA helps evaluate different potential locations or scenarios by assessing them against a set of criteria that are relevant to a specific planning goal.

This MCA is broken down into five key themes:

- Environmental sustainability
- Infrastructure and accessibility
- Cultural and social equity
- Economic and land use planning
- Housing and demographic needs

These themes are relevant to the key messages and themes received through community feedback, existing planning policy direction and the Spatial Plan goals and principles.

The MCA informs decision making but should not be used solely to provide definitive answers about the best alternative or option (that is, MCA is a tool that supports decision making, but it does not make decisions). Critical thinking should be applied when using MCA, when selecting MCA criteria and making decisions around the relative importance of specific criteria. An MCA should be undertaken, using equal weightings, in the first instance and then weighting can be applied, if needed, as part of scenario analysis.

Figure 1: Multi Criteria Analysis of short list development options and new development areas to assess

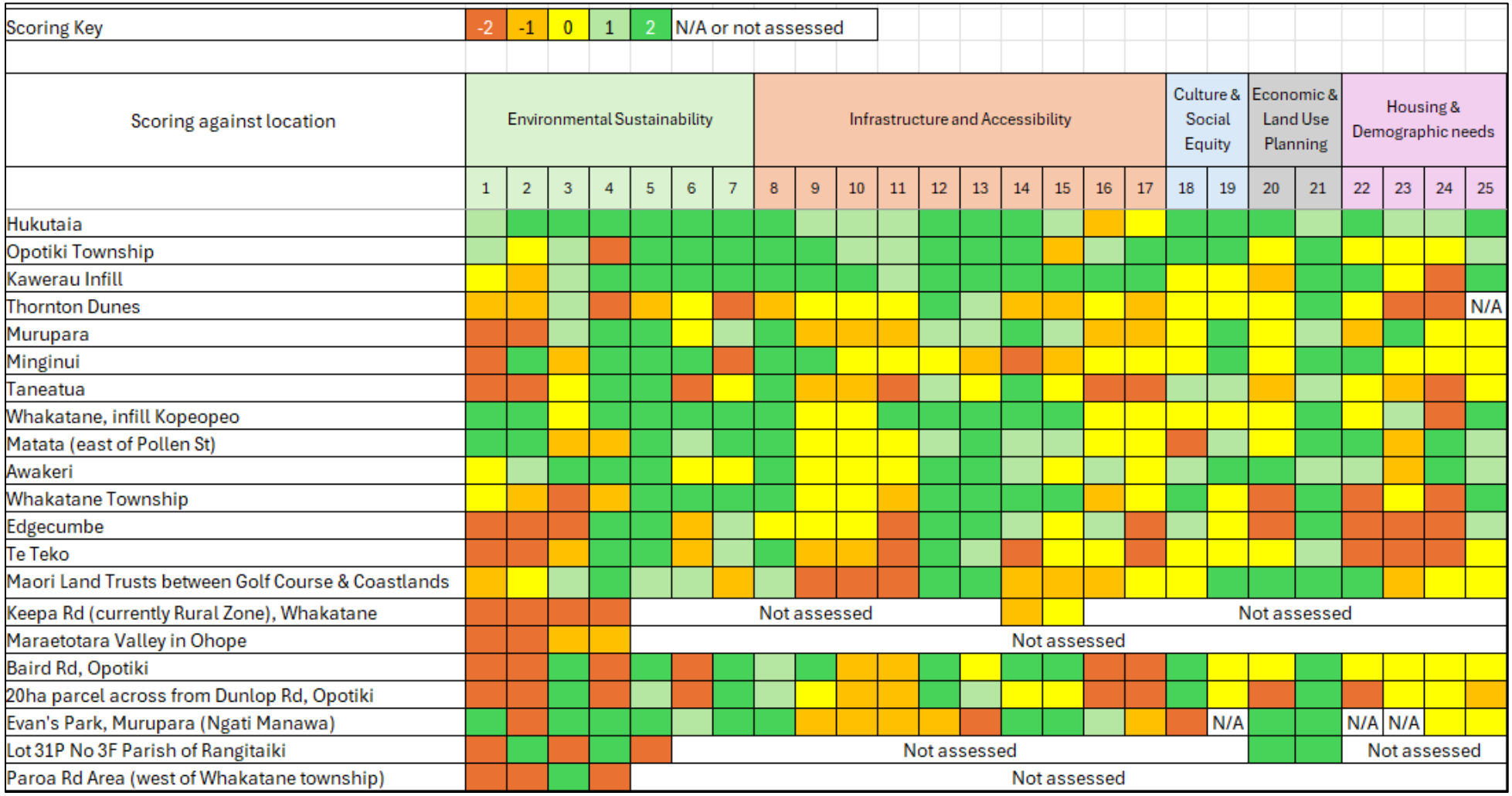

Figure 2: Measures and Assessment Criteria Scoring

Environmental Sustainability		
#	***Measures***	***Assessment Criteria Scoring***
1	A comprehensive Natural Hazard Risk Assessment ("NHRS") is planned, completed, or not required for the proposed growth location	2 = Natural Hazard Risk Assessment is completed of not required. 1 = NHRS is in progress but not yet completed. 0 = NHRS is required and planned. -1 = NHRS is required, planning is uncertain or delayed. -2 = NHRS is required but not planned.
2	There is an anticipated or planned approach to integrated flood plain management, or no requirement to be done.	2 = No known flood risk 1 = Known flood risk and existing approach to flood plain management 0 =known flood risk and planned approach to flood plain management -1 = known flood risk and unconfirmed approach to flood plain management -2 = known flood risk and no planned approach to flood plain management
3	The area is located outside high geohazard risk areas, such as landslide-prone slopes, fault lines, liquefaction and volcanic hazard zones.	2 = yes 1, 0, -1 = partially -2 = no
4	The area is located outside of identified high-risk tsunami hazard zones, such as low-lying coastal areas, as defined in the Bay of Plenty Regional Council tsunami evacuation maps	2 = yes 1, 0, -1 = partially -2 = no
5	There are significant natural sites	*Not located within an identified natural site or area* 2 = no 1,0 = partially based on extent

		-1 = yes, but mitigated -2 = yes, not mitigated.
6	Are Land Use Classification ("LUC") 1, 2, 3 soils impacted	*Development on Class 1, 2 or 3 soils is protected and/or avoided. The location of these as defined by Landcare Research.* 2 = area exempt/no LUC 1,2,3 1, 0, -1 = partially based on extent -2 = LUC 1, 2, 3 are impacted by development
7	Does development in this area create opportunity for more short active mode trips (10-15 min walk or bike ride)	2 = Yes 1, 0, -1 = partially -2 = no
Infrastructure and Accessibility		
#	***Measures***	***Assessment Criteria Scoring***
8	There is an existing or planned settlement adjacent	2 = has existing capacity, and funded infrastructure available to meet future growth 1 = has existing capacity, and planned infrastructure capacity upgrades to meet future growth 0 = has existing capacity, but no planned infrastructure capacity upgrades to meet future growth -1 = insufficient capacity, no plans to extend infrastructure services -2 = insufficient capacity, no feasible affordable options to extend services
9	Water Supply: there is existing capacity or planned supply to service proposed growth	
10	Wastewater: there is existing capacity or planned supply to service proposed growth	
11	Stormwater: there is existing capacity or planned supply to service proposed growth	
12	Proximity to employment opportunities (30mins by PT or car)	2 = within a 30min drive of a major employment hub (e.g. regional center, industrial site, agricultural processing facility) or town with diverse job opportunities.

		1 = within a 45min drive of steady employment options, including manufacturing plants, farms, schools, hospitals, or local businesses. 0 = within a 60min drive -1 = more than 1 hour away from employment areas with limited job opportunities nearby. -2: located in area classified by ministry of social development as limited employment area.
13	Proximity to schools (primary: 1-3km, secondary 3-5km)	2 = Both primary and secondary within proximity range 1, 0, -1 = either primary or secondary within range -2 = no schooling within range
14	Proximity to essential services, healthcare, retail, recreation (800m or 15min walk)	2 = Most essential services within walkable catchment 1, 0, -1 = some essential services within walkable catchment -2 = no essential services within walkable catchment
15	Accessibility to main transport networks and/or public transport (“PT”)	2 = excellent access to major roads and PT 1 = good access but needs minor upgrades or improvements 0= moderate access with some limitations in connectivity or frequency of PT -1 = limited access, no PT services -2 = poor access, no viable transport links in near future
16	Net debt to revenue limit (relative potential for DC's, scale of growth, and potential for private investment considering consolidated large land holdings)	*Capital / operational costs can be accounted for (with sequencing aligned with growth) in Long Term Plans without exceeding Financial Strategy limits* 2 = Net debt well below revenue limit. High potential for development contributions, strong growth prospects, significant private investment interest. 1 = Net debt within comfortable range. Moderate potential for development contributions and private investment.

		0 = Net debt approaching limits but manageable. Moderate potential for development contributions and private investment. -1= Net debt near or at revenue limit. Low potential for development contributions and limited private investment interest. -2 = Net debt exceeds revenue limits. Very low or no potential for DC's and private investment.
17	The sequencing of development aligns with Long Term Plans ("LTP")	*Capital / operational costs can be accounted for (with sequencing aligned with growth) in LTP without exceeding Financial Strategy limits.* 2 = Costs fully accounted for in LTP and well-aligned to growth. 1= Costs mostly accounted for in LTP, and minor adjustments needed to align with growth. 0 = Costs included in LTP with some constraints. Some adjustments may be needed to stay within limits. -1 = Costs difficult to accommodate in LTP without exceeding limits. Misalignment with growth. -2 = Costs cannot be accounted for in LTP without significantly exceeding limits resulting in poor sequencing.
Culture and social equity		
#	***Measures***	***Assessment Criteria Scoring***
18	Sites of cultural significance identified in Iwi and hapu resource management plans are avoided and/or engagement undertaken to reaffirm or understand where these sites may exist in potential development zones.	2 = Sites clearly identified in resource management plans are avoided. 1, 0, -1 = Some sites identified but further engagement required to confirm avoidance -2 = Sites not identified and further engagement required to confirm avoidance.
19	Supports iwi/hapū aspirations to develop/ enable land use	2 = Development supports iwi/hapū aspirations to develop / enable land use. 1, 0, -1 = dependent on extent of known interest to development site and engagement undertaken

		-2 = does not support iwi/hapū aspirations to develop / enable land use.
Economic and land use planning		
#	***Measures***	***Assessment Criteria Scoring***
20	Is the area likely to provide a supply of land to meet housing demand for a 30 year period? (score relative to land area and localised requirement i.e., the land area required in one area might be smaller because the demand is smaller)	*Funding and planning take into account:* *Scale* *Current status in district plan and long term plans* *Land ownership* 2 = Ample, well-planned land supply to meet 30-year housing demand. 1 = Likely to meet most demand with some rezoning needed. 0 = Potential to contribute with uncertainties in supply or public interest. -1 = Unlikely to fully meet demand due to constraints or limitations. -2 = Major barriers make long-term supply highly unlikely.
21	The location avoids or minimises public health risk from known land use conflicts.	*Locations are considered on whether they are identified on or are adjacent to land use activities that are included within the hazardous activities and industries list ("HAIL"). This primarily relates to sensitive receiving activities including residential land use.* 2 = The location is already zoned and enabled for residential development 1, 0, -1 = The location is on HAIL and can be remediated / effects addressed through structure planning. -2 The location is not able to be remediated or has known neighbouring land use conflicts that would result in inappropriate development.
Housing and demographic needs		
#	***Measures***	***Assessment Criteria Scoring***
22	Is there opportunity for papakāinga development or community housing providers.	2 = District plan enabled, with existing developer/landowner interest

		1 = District Plan enabled, but dependent on developer/landowner interest 0 = District Plan enabled, but no developer/landowner interest -1 = Not District Plan enabled, but some developer/landowner interest -2 = Not District Plan enabled, no developer/landowner interest
23	Is there opportunity to deliver diverse housing typology to accommodate changing demographics.	2 = District Plan enabled, with existing developer/landowner interest 1 = District Plan enabled, but dependent on developer/landowner interest 0 = District Plan enabled, but no developer/landowner interest -1 = District Plan enabled, but some developer/landowner interest -2 = Not District Plan enabled, no developer/landowner interest
24	Is there opportunity for retirement living village/communities?	2 = District Plan enabled, with existing developer/landowner interest 1 = District Plan enabled, but dependent on developer/landowner interest 0 = District Plan enabled, but no developer/landowner interest -1 = District Plan enabled, but some developer/landowner interest -2 = Not District Plan enabled, no developer/landowner interest
25	The location provides a variety of high-quality recreational and community facilities to address diverse needs and preferences of the community.	2 = Wide variety of high-quality facilities 1 = Some variety of quality facilities 0 = Limited facilities -1 = Few or low-quality facilities, -2 = No facilities.